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Editorial: Parent, Grandparent, and Sibling Responses to the Death of an Infant or Child in Intensive Care

The death of a child is a devastating event for most parents and other family members[1]. However, responses to a child's death vary by culture, generation, and often the age of the deceased child. For the Chinese, child death is a "bad death" and brings shame to the family[2]. Filipino parents of a deceased child feel severe guilt after their loss[3]. In some Caribbean cultures young mothers are prevented from attending the child's funeral or going to the cemetery by women in the previous generation in the belief that if you "take one to the cemetery you will be taking all of your other children there as well." In other cultures, those who die as children have not sinned, securing their place in heaven[4].

In the ethnically-diverse US, more than 43,000 children aged 18 and younger die each year[5], most in intensive care units[6]. Friends, relatives, co-workers, and healthcare providers (HCP) often are uncomfortable with the parents after their child's death, not knowing what to do, what to say, and what would help the deceased's parents and family members. Many assume that parents and family members want to be left alone after the infant's or child's death. As a result, parents, siblings, and grandparents report feeling isolated and abandoned by those close to them when they need them most[7-10]. Little research has been done with these US family members in the difficult first year after the child's death. What has been done has shown that studies of parents have been conducted years, even 3-7 decades[11], after their infant's or child's death. However, many studies have very diverse samples regarding the age of the "child" at death. In some studies, family members are responding to the death of a "child" who died in childhood (≤18 years old) and a "child" who died as an adult (19 and above), sometimes as old as 40, in the same study[12]. In addition, studies of siblings whose brother or sister died during the sibling's childhood are often retrospective. Some studies postpone data collection until the sibling reaches adulthood; and some studies recruit bereaved siblings when they are adults. Very few studies have been undertaken with grandparents of the deceased child.

With funding from the US NIH National Institute of Nursing Research and the National Institute of General Medical Sciences, a body of research has been conducted on parents', grandparents' and siblings' health and functioning during the first year after the infant's or child's death in the neonatal intensive care unit (NICU) or pediatric intensive care unit (PICU) to fill our knowledge gap.

Parent Study

Youngblut, Brooten, Cantwell, Del-Moral, and Totapally[13] conducted a longitudinal study of 176 mothers and 73 fathers whose infant or child (N=188) died in the NICU/PICU. Parents provided data on their own physical and mental health and functioning at 1, 3, 6, and 13 months after their child's death. Mean ages were 32 (SD=8) for mothers and 37 (SD=9) for fathers; 79% of parents were Hispanic or Black (African American, African Caribbean)[13]. More than half of the deceased children were infants (63%), male (55%), and died in the PICU (55%) after treatment was limited or withdrawn (57%)[13,14].

Parent Physical & Mental Health. In the 13 months after the infant's/child's death, there were 98 parent hospitalizations, 132 new chronic health conditions, and 2 new cases of cancer[13]. During this time, more mothers had severe symptoms of depression (35%) and post-traumatic stress disorder (PTSD) (35%) than fathers (24%, 30%, respectively). Depression and PTSD were more common among Hispanic and black mothers than white mothers[13]. In the first 13 months, a child death was associated with decline in parental physical and mental health.

We then examined when most parents' acute illnesses and other morbidity occurred to determine the best time for interventions[15]. Most parents' physical health problems occurred in the first 6 months after the death and peaked again around the anniversary of the child's death. Parents, mostly mothers, experienced more than 400 acute illnesses and almost 100 hospitalizations in the first 13 months, regardless of race/ethnicity[15]. On average, mothers had more physical health problems than fathers during the first 13 months after their infant's/child's NICU/PICU death. These findings suggest that bereaved parents may need more primary health care visits in the first 6 months and again around the anniversary of their infant's or child's death.

Parent Grief. Grief intensity declined for mothers throughout the first 13 months after their infant's/child's death. Fathers had a significant drop in despair between 3 and 6 months after the death, but the intensity of other aspects of grief remained unchanged through 13 months[14]. Mothers reported more intense symptoms of panic and despair, and had more difficulty concentrating and remembering things than the fathers in the same family. Feelings of panic and emotional distance from family and friends were greater for Hispanic mothers than black or white mothers. Spiritual growth was greater for black than Hispanic mothers from 1 to 6 months post child death. The level of grief from 1 to 13 months after the death was consistently higher for mothers of deceased adolescents than mothers of deceased infants. Grief was greater for mothers if their child was declared brain dead than if health care providers tried to resuscitate the child or if they had decided to stop mechanical ventilation[14].

Parent functioning. Two parent roles in the family, their relationship with the other parent and their employment, were examined. The proportion of parents with partners (72%) was about the same at 1 and 13 months post-death[13]. There were 32 new pregnancies during the first 13 months after the death, most in the first 6 months. Most mothers (68%) and fathers (93%) were employed at the time of the infant's or child's death. Although a few mothers and fathers returned to their jobs immediately after the death, 74% of fathers returned to employment by 2 weeks, and 50% of mothers, by the end of the first month[13].

Grandparent study

Youngblut, Brooten, Blais, Kilgore, and Yoo[16] conducted a cross-sectional study on the physical and mental health, and functioning of 99 grandmothers and 37 grandfathers in the first year after death of their newborn through 6-year-old grandchild. Grandparents' mean age was 55.3 (SD=9.8), with a range of 36-77 years. Most grandparents were female (73%), black or Hispanic (62%), high school graduates (87%), married or living with a partner (63%), and employed before (68%) and/or after the death (63%).

The 115 deceased grandchildren ranged from newborn to 72 months of age. Most were 12 months old or younger (72%), male (65%), and died in the hospital (77%). Prematurity and congenital/genetic conditions were the two most common causes of death[16], consistent with US national data[17].

After the grandchild's death, 28% of the grandparents reported a total of 59 illnesses and 5% reported 7 hospitalizations[16]. Most grandparents (68%) had been diagnosed with at least one chronic health condition including mental health problems, hypertension, angina, cancer, and arthritis. Based on the severity of their symptoms of depression and PTSD, grandparents were classified as having moderate-severe clinical depression (14%), clinical PTSD (35%), or both (20%)[16], higher than the 8% reported for adults 60 and older in the US[18]. The severity of their PTSD symptoms was significantly greater for black grandparents than white grandparents[16]. Severity of their symptoms of depression, PTSD, and grief also was significantly higher for grandparents who had provided some childcare for their deceased grandchild. White and black grandparents had more intense PTSD symptoms if they provided childcare for the deceased.

Grandparent Functioning. Most grandparents were employed before (68%) and after (63%) the grandchild's death[16]. More grandmothers (80%) took time off from work than grandfathers (45%). Most employed grandparents returned to work by 14 days post-grandchild death. Grandparents who had provided some childcare for this grandchild had significantly more trouble focusing on their work than grandparents who rarely/never provided childcare[16]. When on the job, black grandparents thought about their deceased grandchild significantly more often than white grandparents, regardless of time since the death. The quality of the grandparent's relationship with their spouse/partner was not affected by their race/ethnicity, level of childcare, or time since the grandchild's death[16].

Sibling Study

Youngblut, Brooten, Cantwell, Del-Moral, Totapally, and Yoo[19] conducted a longitudinal study to describe the physical health, mental health, and functioning of 132 surviving children, ages 6-18, over the first 13 months after their sibling's death. Most of the surviving children were girls (58%) and school-aged (6-12 years old). Most of the 71 deceased siblings were boys (62%), died in the PICU (63%), and had unsuccessful resuscitation (35%) or limitations in treatment (30%). The group of deceased siblings were 37% adolescents, 37% infants, 21% school aged, and 5% preschoolers.

Children's Health. Parents reported a total of 207 illnesses among 50% of the surviving children and a total of 674 treatments and health services among 70% of the children during the 13 months after their sibling's NICU/PICU/Emergency Department (ED) death[20]. Illnesses included gastrointestinal problems, allergies, gynecological problems, headaches, colds/flu, ear infections, eye problems and anxiety. Most (64%) of these occurred in the first 6 months. Most of the treatments and health services were used by girls (66%) in the first 6 months (65%). Treatments and health services included psychiatric referrals and/or therapy, medications, and office visits to pediatric health care providers, dentists, and specialists. Hispanic children used significantly more treatments/health services than black children. Children's pattern of illnesses, treatments, and health service use [20] was consistent with the pattern of parents' illnesses, hospitalizations, and medication changes[15] in an earlier study, with most occurrences in the first 6 months and an increase in occurrences around the anniversary of the brother's or sister's death in the PICU, NICU, or ED. Parent and child distress also increased around the anniversary of the infant's/child's death[15].

Although more research is needed on the health and functioning of parents and family members after the death of an infant or child, the findings to date have provided guidance on interventions to help parents and family members after the death. It is clear that the first 6 months after the infant's/child's death are especially challenging and a time where interventions to prevent acute and chronic illnesses are needed to help parents and surviving children. In the US, black and Hispanic families seem especially vulnerable and need monitoring of their health and preventive interventions. Parents and other family members need to be reminded by healthcare providers about frequent handwashing to prevent infection, getting enough sleep, and eating a healthy diet soon after the infant's or child's death.

Nursing curricula need to include information about bereaved families, especially from research evidence, and address individual beliefs and myths. For nurses in practice, annual workshops could be designed to provide the latest research news about bereaved families. Role-playing sessions incorporated into the workshop would allow nurses to practice communication with families of dying and deceased family members. This is especially important for nurses who work in units where death is most common, such as intensive care units. Having a counselor or therapist available to nurses and other healthcare providers who deal with death and dying would allow them to discuss and work through their feelings and thoughts about the deaths they have experienced.

Findings from this body of research with US parents and families call for studies to determine if parents from other countries and cultures experience the same health and functioning outcomes after losing a child. Do parents from other countries and cultures experience similar acute and chronic conditions in the first year after an infant's or child's death? Do mothers and fathers in these countries and cultures differ in their responses? What is the response of grandparents and surviving siblings to the death? Much research is needed to find answers to these questions.

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References

1. Rini A, Loriz L. Anticipatory mourning in parents with a child who dies while hospitalized. J Pediatric Nurs. 2007; 22:272-282. doi:10.1016/j.pedn.2006.08.008
2. Yick AG, Gupta R. Chinese cultural dimensions of death, dying and bereavement: Focus group findings. J Cultural Diversity. 2002;9:32-43.
3. Parry JK, Shen Ryan A. A cross cultural look at death, dying, and religion. Chicago: Nelson-Hall, 1995.
4. Brooten D, Youngblut JM, Charles D, Roche R, Hidalgo I, Malkawi F. Death rituals reported by White, Black and Hispanic parents following the ICU death of an infant or child. J Pediatric Nurs. 2016;31:132-140. DOI: 10.1016/j.pedn.2015.10.017 PMC 4769949
5. Murphy SL, Xu JQ, Kochanek KD, Curtin SC, Arias E. Deaths: Final data for 2015. National Vital Statistics Reports. 2017:66(6). Hyattsville, MD: National Center for Health Statistics.
6. Ramnarayan P, Craig F, Petros A, Pierce C. Characteristics of deaths occurring in hospitalized children: Changing trends. J Med Ethics. 2007;33(5): 255-260.
7. Brooten D, Youngblut JM. School aged children's experiences 7 and 13 months following a sibling's death. J Child Fam Stud. 2017;26(4):1112-1123. doi: 10.1007/s10826-016-0647-7 PMC 5568838
8. Brooten D, Youngblut JM, Roche RM. Adolescent's experiences 7 and 13 months following the death of a brother or sister. J Hospice Palliat Nurs. 2017;19(3):247-255. doi:10.1097/NJH.0000000000000336 PMC 5568690

9. Gilrane-McGarry U, O'Grady T. Forgotten grievers: An exploration of the grief experiences of bereaved grandparents (Part 2). Int J Palliat Nurs. 2012;18(4):179-187. doi:10.12968/ijpn.2012.18.4.179
10. Nehari M, Grebler D, Toren A. A voice unheard: grandparents' grief over children who died of cancer. Mortality. 2007;12(1):66-78.
11. O'Leary J, Warland J. Untold stories of infant loss: The importance of contact with the baby for bereaved parents. J Fam Nurs. 2013;19(3):324-347. doi:10.1177/1074840713495972
12. Youngblut JM, Brooten D. Perinatal and pediatric issues in palliative and end-of-life care from the 2011 Summit on the Science of Compassion. Nurs Outlook. 2012;60(6):343-350. doi: 10.1016/j.outlook.2012.08.007.
13. Youngblut JM, Brooten D, Cantwell GP, Del-Moral T, Totapally B. Parent health and functioning 13 months after infant or child NICU/PICU death. Pediatrics. 2013;132(5): e1295-301. doi: 10.1542/peds.2013-1194 Epub 2013 Oct 7. PMC3813397
14. Youngblut JM, Brooten D, Glaze J, Promise T, Yoo C. Parent grief 1-13 months after death in neonatal or pediatric intensive care units. J Loss Trauma. 2017;22(1):77-96. Epub 2016 May 9. doi: 10.1080/15325024.2016.1187049. PMC 5322480
15. Brooten D, Youngblut JM, Caicedo C, Del-Moral T, Cantwell GP, Totapally B. Parents' acute illnesses, hospitalizations, & medication changes during the difficult first year after infant or child NICU/PICU death. Am J Hospice Palliat Med. 2018;35(1):75-82. [Epub ahead of print 2016 Nov 15]. doi: 10.1177/1049909116678597. PMC 5344737
16. Youngblut JM, Brooten D, Blais K, Kilgore C, Yoo C. (2015). Health & functioning in grandparents after a young grandchild's death. J Community Health. 2015; 40:956-966 doi: 10.1007/s10900-015-0018-0 PMC 4556739
17. Kochanek KD, Murphy SL, Xu JQ, Arias E. Mortality in the United States, 2016. NCHS Data Brief. 2017;no 293. Hyattsville, MD: National Center for Health Statistics.
18. Brody DJ, Pratt LA, Hughes JP. Prevalence of depression among adults aged 20 and over: United States, 2013-2016. NCHS Data Brief, no 303. Hyattsville, MD: National Center for Health Statistics. 2018.
19. Youngblut JM, Brooten D, Del-Moral T, Cantwell GP, Totapally B, Yoo C. Black, white, and Hispanic children's health and function 2-13 months after sibling ICU death. In review.
20. Brooten D, Youngblut JM, Roche RM, Caicedo C, Page T. Surviving siblings' illnesses, treatments/health services over 13 months after a sibling's death. J Child Fam Stud. 2018;27:2049-2056. doi: 10.1007/s10826-018-1044-1. PMC in progress.

Effect of Self-Management Exercise Program on Physical Fitness among People with Prehypertension and Obesity: A Quasi Experiment Study

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Abstract: Lack of exercise related to poor self-management can lead to a low level of physical fitness in people with prehypertension and obesity. Self-management has the potential to enhance exercise performance with moving people from the beginning of behavior change to action and maintenance behavior. This study investigated the effect of the Self-Management Exercise Program on physical fitness in persons with prehypertension and obesity developed by primary investigator. A total of 32 participants were randomly assigned to two groups: the experimental group (n=16) receiving the Self-Management Exercise Program and the control group (n=16) receiving conventional care. Physical fitness was evaluated by the 3-minute step test, 60 second chair stand, and sit and reach test at baseline and 12-week. Data analyzed using descriptive statistics, Chi-square test, Independent *t*-test, and Paired *t*-test.

The results demonstrated that the experimental group had significantly higher physical fitness compared to before the program; and significantly higher than those compared to the control group. The Self-Management Exercise Program is effective and improves physical fitness in people with prehypertension and obesity including cardiorespiratory fitness, muscular endurance, and flexibility. Nurses can apply the program to enhance physical fitness in this population by increasing exercise behavior through self-management skills. Further study is needed to confirm whether the physical fitness increases over an extended time using the program.

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Introduction

Physical fitness is important for people with prehypertension and obesity in staying healthy. In prehypertension, systolic blood pressure (SBP) ranges from 120-139 millimeters of mercury (mmHg), or the diastolic blood pressure (DBP) ranges from 80-89 mmHg. The indication of obesity is that the body mass index (BMI) is ≥25 (kilogram/meter^2, kg/m^2).[1,2] Improvement of physical fitness is associated with blood circulation improvement, a lower risk of hypertension (HT), increase muscle strength, and building strong bones.[3] Moreover,

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physical fitness improves mental strength such as enhancing one's memory.[4]

Previous studies showed that a low level of 73.4% in physical fitness, and over 90% of those with prehypertension and obesity have a lack of exercise according to the American College of Sports Medicine (ACSM).[4,5] The Thai National Statistical Office reported that, in 2015, less than a quarter (23.40%) of Thai people performed exercise and duration of exercise averaged 35.23 minutes per day.[6] Lack of exercise related to poor physical fitness is often caused by barriers to exercise at the individual level and include lack of time, preferring to do other things, and lack of enjoyment, motivation, confidence, and money.[7]

Exercise has benefits to help those with prehypertension and obesity by delaying and preventing of the related diseases.[5] They have to learn about their own assessment, monitoring behavior, establishing goal, plan and performance skills, and balancing positive and negative attitudes in order to control and manage their behavior.[8] Self-management has the potential to enhance exercise adherence with moving people from the beginning of change to action and maintenance.[9,10,11] It is not only behavior change, but also a crucial strategy that can effectively help people to improve physical fitness.[12]

The concept of the self-management suggests that people's responsibility to accept treatment needs a strong motivation to change.[13] This concept relates to a person's behavior to compare between the obtained information and target behavior, and the reaction to their own behavior. It is more effective cognitive and interpersonal actions to change behavior. Consequently, the behavior change is to improve health status or health outcomes.

A descriptive study found a positive relationship between self-management score and exercise behavior in persons with prehypertension.[11] Also, self-management has increased risk awareness and improved self-management behavior among study participants.[14,15] In addition self-management program improve health outcome and enhance physical fitness related to better quality of life among persons who live with chronic illness.[16] Furthermore, self-management in lifestyle modification program has been found to be helpful in adopting healthy lifestyle habits and improving physical fitness in overweight or obese adults. However, more than 30% of participants did not complete exercise sessions.[17]

Previous studies of self-management with prehypertension were likely to focus on behavior change and the previous program did not specify in the obese population. Moreover, outcome evaluation measuring program effects on physical fitness in this group was still questionable.[11] Thus, the purpose of this study was to test the effectiveness of the Self-Management Exercise Program (SMEP) on physical fitness among persons with prehypertension and obesity.

Literature review

Physical fitness is a set of attributes or characteristics individuals had or achieved that relate to ability to perform daily activities.[18] Components of physical fitness that relate to health include cardiorespiratory fitness, muscular endurance, and flexibility. Cardiorespiratory fitness is the ability of the body involving heart, lungs vessels, and large-muscles to perform exercise for prolonged period.[3,18] Muscular endurance is the ability of muscles to repeatedly contract or continuous contractions over a longer period of time.[18] Flexibility is the ability of joints and muscles to move a full range of motion.[3,18] The importance of physical fitness is the relationship with health since low physical fitness leads to adverse health outcomes such as cardiovascular disease while higher level of physical fitness is associated with lower risks for poorer health.[19]

Poorer physical fitness is found more than half of people with prehypertension and obesity,[3,20,21] and these are important risks for developing hypertension.[21,22] Prehypertension is strongly associated with obesity in adults.[23,24] People with prehypertension and obesity have a three times higher risk of hypertension progression than those with prehypertension and normal weight.[25,26] Physical fitness is associated with physical activity especially exercise. However, a large number of people with prehypertension and obesity lack of exercise.[3,20,21]

Various studies applying the self-management concept were effective in improving health behaviors and health outcomes.[11,14-17] Self-management, emphasizing changes in behaviors can prevent further illness,[13,27] and self-management models consist of self-monitoring, self-evaluation, and self-reinforcement.[13] Brisk walking exercise is recommended as a clinical guideline to prevent hypertension in high risk groups.[18]

Brisk walking is an aerobic exercise that involves large-muscles and is effective to improve health outcome including cardiorespiratory fitness.[19,28] For promoting health and physical fitness, the recommendation is moderate intensity of exercise with the target heart rate zone of 64%-75% of maximum heart rate (%HR_{max}) which is calculated by subtracting the person's age from 220. The goal of brisk walking is estimated at 100 steps per minutes providing approximate moderate intensity of exercise for 30-60 minutes per day about 5-7 days per week.[18]

Moreover, resistance training and stretching exercise is also recommended for people with prehypertension and obesity.[18] Resistance training is a type of exercise that promotes muscle strength such as chest press, abdominal crunch, leg press, resistance bands, and weight lifting. Resistance training should be done 2 to 3 days per week with 8-12 repetitions, 1-2 sets which is effective in improving muscle endurance.[18] Stretching exercise helps to promote flexibility by improving the range of motion in muscle, joint, and tendon such as hamstring, shoulder, back, and stretches. This exercise is recommended 2-3 days per week daily being most effective holding a static stretch for 10-30 seconds with 2 to 4 repetitions for most adults.[3,18]

Therefore, in this study, the Self-Management Exercise Program (SMEP) was developed by applying self-management model in exercise program. The program comprises brisk walking, weight lifting, and stretching exercise to improve physical fitness in people with prehypertension and obesity. It was hypothesized that the participants in the experimental group would have lower mean of heart rate, higher mean of number of completed stand for muscular endurance, and higher mean of distance between starting and reached point for flexibility at 12th week compared to the control group and compared before receiving the SMEP.

Methods

Design: This intervention study used a quasi-experimental with a two-group pretest and posttest design.

Sample and Setting:

The sample size was calculated using the G*Power Program. A significance level of .05, a power level of .8, and effect size of 1.02 were set. This effect size was obtained from a previous study of self-management exercise intervention on cardiorespiratory fitness in persons with non-communicable disease.[29] The result of program suggested a sample size of each group was 13 and total sample size was 26. Concerning 20% of attrition rate of a similar study, a total of 32 participants, 16 in each group, were enough. The participants were recruited in the study based on the inclusion criteria: 1) age 35-59 years; 2) SBP of 120-139 or DBP of 80-89 mmHg; 3) not taking antihypertensive drugs; and 4) BMI ≥ 25 kg/m^2. The exclusion criteria were the participants unable to attend five sessions of the program for the experimental group.

One district of one province in central of Thailand was purposively selected due to it having a middle-age population with overweight or obesity about 45.09% and it was consistent with increasing of hypertension, which was the first leading cause of morbidity in this province.[30,31] Then, two of four sub-districts were randomly selected by the drawing lot technique. Potential participants were obtained from databased of two primary care units which were in selected sub-districts. The potential participants who lived in the first sub-district were randomly selected by drawing lot technique and were assigned in the control group while those who lived in another sub-district were randomly selected by the same technique and were assigned in the experimental group. The participants were selected until reaching the total number which was 16 participants in each group.

Ethical Considerations

The study was approved by the Research Ethics Review Committee, Chulalongkorn University, Thailand (No.042/2559). Potential participants were informed about the research objectives and all procedures of the SEMP and the study and their rights were protected with regard to data confidentiality, and right to refuse participation and withdraw from the study at any time. The participants could ask any questions and receive the answers from the primary investigator (PI) before making a decision to participate in the study. Data collection was performed after the participants gave written consent form. The PI kept the completed questionnaire in a locked cabinet and computer was protected by using password. Only the PI had access to the data.

Research instruments:

A demographic data form was developed to obtain information such as age, gender, education level, marital status, occupation, and exercise behaviors.

An exercise diary was the instrument to collect data on participants' daily exercise, and was developed by PI. The participants recorded the frequency, intensity, time, and type of exercises and the diary was used to monitoring exercise behavior of the participant through self-management skills.

Physical fitness was composed of three indicators; cardiorespiratory fitness, muscular endurance, and flexibility. A **physical fitness form** to obtain the data was developed by PI. One research assistant was trained to record all the data in this form. The assessment was performed following guideline of ACSM and Department of Physical education.[3,32]

Cardiorespiratory fitness involved supplying oxygen of body to muscles for exercise, measured by performing three-minute step test designed to evaluate response of heart rate in one minute during cardiovascular activity. The three-minute step test needed each participant to perform the test by stepping up and down from a 12-inch step. At the end of three minutes, each person stopped and then heart rate was measured and recorded. A lower heart rate represented higher cardiorespiratory fitness level.[32]

Muscular endurance involved repetition of muscle against resistance. It was measured by performing the 60-second chair stand test designed to evaluate the total number of a full standing position and sit back down in chair with arms to be crossed over chest for 60 seconds. Higher scores represented higher fitness level in muscular endurance.[32]

Flexibility involved movement of muscles and joints. It was evaluated by sit and reach test designed to measure the distance between starting and reached point in the centimeters when the participant sat on the floor with legs stretched out and knees straight by against the testing box, placed hand over hand, and slowly slide hand forward on the scale of box as far as possible. Participants had to perform two times and the highest score was recorded in the centimeters (cm). Higher scores represented higher fitness level in flexibility.[32]

The Self-management Exercise Program

This program was developed by PI based on the concept of self-management[13] and exercise guidelines of American College of Sports Medicine for improving physical fitness in persons with prehypertension and obesity.[18] It was composed of five sessions over a 12-week program period leading by the PI and consisted of various strategies such as group discussion, home visits, and telephone visits. The content was validated by five experts. Major comments and suggestions included 1) to avoid spending time too much in two first sessions, 2) to revise difficult part for education session, and 3) to control the intensity of exercise by simple way such as talk test and heart rate measurement. After receiving comments and suggestions, the program was revised as follows:

The first session began with 30 minutes of problem assessment and motivation to change and increase exercise behavior by encouraging the participants to express their own health problem and share experience about health behaviors in the past including helping them to set goal of behavioral change.

The second session was a small group education and training focused on the provision of information about exercise self-management for 90 minutes. Activities comprised providing target exercise behavior, practicing exercise in brisk walking, weight lifting, and stretching exercise, and practicing to write effective goals, self-monitoring, self-evaluation, self-reinforcement, and action plan. Additionally, the participants learned how to record exercise behavior and were given an exercise booklet and exercise diary.

The third session began after completing education and training session for a week. This session was a 60-minute small group discussion. The activities composed sharing and discussion on exercise experience including practice, strength, problems, and barriers of performance, and exercise record.

The fourth session was telephone visit used to monitor exercise behavior of the participants for about 15-30 minutes at 2nd, 3rd, 6th, and 10th week. This session focused on exercise behavior at home including consultations, helping the participants to reduce exercise barriers, and encouraging them perform exercise continuously.

The fifth session was home visit which was strategy to monitor exercise behavior of the participants about 15-30 minutes at 4th and 8th week. This session focused on exercise behavior record in exercise diary, goal setting, and support to perform following the protocol program.

Exercise program in the SMEP included stretching exercise for 5-10 minutes before exercise. Then, brisk walking was performed at a speedy pace faster than normal rate and an individual would have a slightly difficult breathing but still able to converse and performed with the speed at least 100 steps per minute, for 30-60 minutes, at least 5 days per week. Lastly, weight lifting was performed by lifting dumbbell for twice a week with 8-12 repetitions for each muscle group at least one set. Talk test and heart rate were used in determining the intensity of the exercise. Talk test was valid, reliable, and practical for monitoring exercise intensity.[33] Each day, intensity of exercise was determined by talk test and heart rate. Moderate intensity was set in this program to improve physical fitness. People performed moderate intensity of exercise which meant people could talk but could not sing a song during exercise and heart rate in range of 64%-75% of the maximum heart rate. This point was suited to the exercise intensity that was equivalent to moderate intensity of exercise by ACSM.[18] The participants would be trained while performing the talk test and monitoring their heart rate for determining the intensity of exercise. Thereafter, they recorded it in exercise diary. The participants who performed exercise following program at least 80% of the time were included in the experimental group.

Conventional care

The participants in control group received the conventional care: advice for lifestyle modification including nutrition, exercise, and emotional management after being assessed health status. This was delivered by the nurse or health care provider. The participants were measured outcomes variables at first week as baseline and at 12th week as the end of the study.

Data Collection

After the participants were provided with explanation regarding goals and procedure of the study, the participants were asked to sign the consent form. Thereafter, the participants were asked to complete the demographic data form and physical fitness of the participant was assessed including cardiorespiratory fitness, muscular endurance, and flexibility. The physical fitness was measured at baseline and at 12th week after completing the program by research assistance.

Data Analysis

Descriptive statistics were used, including means, standard frequency, percentage, and deviation to describe the demographic characteristics and physical fitness of participants. Chi-square and independent t-test were used to determine differences in demographic characteristics, exercise behavior, and physical fitness between the experimental and control groups. Paired t-test was performed for differences in physical fitness within between groups before and after the program. Statistical significance was set at $p < .05$.

Before analysis, assumption of the independent t-test and paired t-test including normality distribution and homogeneity of variance were tested. Normality distribution of cardiorespiratory fitness, muscular endurance, and flexibility were tested with the One-Sample Kolmogorov-Smirnov test. The results showed non-significance (p>.05). Homogeneity of variance was tested by Levene's test. The results showed no significant differences (p>.05) among dependent variables except cardiorespiratory fitness at 12-week. Therefore, the interpretation of results from this variable needed to be careful by using t-test for unequal variance.

Results

The participants in the experimental and control groups had a mean age of 52.06 years (SD = 4.43) and 53.13 (SD = 6.02), respectively. Most were female, living with spouse, and had completed primary education. About two-thirds (68.75%) of the experimental group was occupied as agriculturists while half (50%) of the control group was laborer. However, there was no significant difference of characteristics of the participants between the experimental and control group at baseline (**Table 1**). Also, there was no significant difference in physical fitness including cardiorespiratory fitness, muscular endurance, and flexibility between both groups at baseline (**Table 2**).

Table 1 Characteristics of the participants (n = 32)

Characteristics	**Experimental group (n=16)**	**Control group (n=16)**	**Statistic value**	***p*-value**
	Number (%)	Number (%)		
Age (year)			.57^a	.57
40-44	1 (6.25)	3 (18.75)		
45-49	3 (18.75)	1 (6.25)		
50-54	7 (43.75)	2 (12.50)		
55-59	5 (31.25)	10 (62.50)		
Mean ± SD	52.06 ± 4.43	53.13 ± 6.02		
Gender			.52^b	.47
Male	5 (31.25)	8 (50.00)		
Female	11 (68.75)	8 (50.00)		
Living with spouse			-	1.00
Yes	14 (87.50)	14 (87.50)		
No	2 (12.50)	2 (12.50)		
Educational level			.15^c	.70
Primary	12 (75.00)	10 (62.50)		
Secondary and higher	4 (25.00)	6 (37.50)		
Occupation			5.29^c	.07
Agriculturist	11 (68.75)	7 (43.75)		
Laborer	2 (12.50)	8 (50.00)		
Other	3 (18.75)	1 (6.25)		

a, *t*-test; b, Chi-square test (Continuity correction); c, Fisher's Exact test; SD, standard deviation

Table 2 Differences in physical fitness (cardiorespiratory fitness, muscular endurance, and flexibility) between the experimental group and control group at baseline (n = 32)

Variable	Experimental group (n = 16)		Control group (n = 16)		*t*	*p*-value
	M	**SD**	**M**	**SD**		
Cardiorespiratory fitness						
Heart rate (beat/minute)	130.63	5.03	128.81	4.92	1.03	.311
Muscular endurance						
Number of completed stand (time/minute)	27.56	7.16	24.44	6.54	1.29	.207
Flexibility						
Distance between starting and reached point (cm)	13.77	6.36	10.33	7.91	1.36	.185

Results in this study supported the hypotheses. Firstly, physical fitness in the experimental group between after receiving the SMEP indicated the experimental group participants had a statistically lower heart rate (p<.01), higher number of completed stand (p<.01), and higher distance between starting and reached point (p<.01) than before receiving the SMEP, which reflected higher physical fitness after receiving the SMEP (**Table 2 and 3**).

Table 3 Comparison of the differences in physical fitness (cardiorespiratory fitness, muscular endurance, and flexibility) between the experimental group and the control group at the 12th week (n = 32)

Variable	**Experimental group (n = 16)**		**Control group (n = 16)**		*t*	*p*-value
	M	**SD**	**M**	**SD**		
Cardiorespiratory fitness						
Heart rate (beat/minute)	123.25	4.34	129.44	7.07	-2.98	.006
Muscular endurance						
Number of completed stand (time/minute)	34.19	6.71	25.44	6.89	3.64	.001
Flexibility						
Distance between starting and reached point (cm)	16.01	5.66	8.19	8.36	3.10	.004

Secondly, when comparing between two groups, there were statistically significant differences in physical fitness [cardiorespiratory fitness (p<.01), muscular endurance (p<.01), and flexibility (p<.01)] at the 12th week (**Table 3**). Also, comparisons of mean differences in physical fitness between both groups indicated that the experimental group had statistically higher mean differences in cardiorespiratory fitness (p<.01), muscular endurance (p<.05), and flexibility (P<.01) compared to those in the control group (**Table 4**).

Table 4 Comparison of mean difference (d*) in physical fitness before and after program between the experimental and control groups

Variables	**Experimental group (n=16)**		**Control group (n=16)**		**Mean Difference**	**t**	**p-value**
	d*	**SD**	**d***	**SD**			
Cardiorespiratory fitness							
Heart rate (beats/minute)	-7.38	6.27	.63	5.61	-8.00	-3.80	.001
Muscular endurance							
Number of completed stand (times/minute)	6.63	5.93	1.00	6.62	5.63	2.53	.017
Flexibility							
Distance between starting and reached point (cm)	2.24	3.22	-2.13	4.41	4.37	3.20	.003

d* = Mean difference between before and after

In additional, at 12-weeks the mean scores of exercise behavior in the control and experimental groups were 16.94 (SD = 15.62) and 76.94 (SD = 3.87) respectively, indicating that the experimental group had higher exercise behavior than the control group. Mean difference of exercise behavior between the two groups was significantly different (t =14.92, p<.01).

The effectiveness of the program on physical fitness was calculated using Cohen's d. The effect size was determined by mean difference between two groups and divided by the standard deviation of control group.[34] At 12-week, the effect sizes of the SMEP on physical fitness including cardiorespiratory fitness, muscular endurance, and flexibility were large (d = 0.85, 1.27, and 0.94, respectively). The results of the study support the benefits of SMEP on three domains of physical fitness in persons with prehypertension and obesity.

Discussion

The results revealed that the SMEP effectively improved physical fitness in participants with prehypertension and obesity. Physical fitness was improved by performing exercise. To ensure that the participants were compliant with exercise, self-management was applied in exercise program. The improvement could be explained that the program motivated their promotion for exercise behavior change leading them to improve their physical fitness.

There were possible reasons of improvement in physical fitness of the participants who attended in the SMEP. First, problem assessment was the first step to identify causes of health problems and barriers of exercise. Second, substantial knowledge and goal setting was provided to clearly specified target exercise behavior. Increasing knowledge of physical fitness and a positive attitude in exercise were consistent with previous studies that the knowledge related to compliance with therapy.[35] Third, the exercise program including brisk walking, weight lifting, and stretching was the effective way to improve cardiorespiratory fitness, muscle endurance, and flexibility. These exercises could be easily performed at home and were less expensive. The findings were supported by the guideline of exercise for increasing physical fitness.[18] Fourth, an exercise diary, which was a self-motoring tool, was used to monitor their exercise behavior. The participants in the experimental group were more likely to engage in an exercise program than those in the control group. Self-monitoring was an effective tool for behavior change with increasing awareness and monitoring progress.[13] Fifth, this program conducted group discussion to help the participants in the experimental group to increase knowledge and confidence in exercise performance, and provided social support. Moreover, monitoring by telephone and home visit enabled the participants to clarify their problems or received the advice that they needed.

The findings of this study are consistent with prior studies using self-management that indicated the effectiveness of self-management to improve physical fitness.[12,36] Previous studies also revealed that the self-management effect on knowledge and health behaviors in persons with chronic illness, both hypertension and metabolic syndrome.[37,38] This study supported a meta-analysis showing effectiveness of increasing exercise or physical activity to improve physical fitness and the behavioral program was the most effective program,[39] and compared favorably with a meta-analysis of the self-management program on health status and outcomes in people who had chronic diseases.[40]

Limitation

The participants with prehypertension and obesity lived at only two selected sub-districts in one central province of Thailand. Thus, generalization is limited to persons with prehypertension and obesity in other cultures and different settings. This study focused on self-management exercise program to improve physical fitness. Other factors that may affect to physical fitness may need to be examined. The 12-week intervention might have been too short and might have affected the findings; therefore, an extended duration of the intervention might improve further physical fitness. Also, future studies should evaluate health outcomes such as hypertension risk awareness, quality of life, BP, body weight, BMI, body composition, lipid profile, and glucose.

Conclusions and Implication for Nursing Practice

Results supported that the SMEP was an effective strategy for enhancing exercise behavior and improving physical fitness in people with prehypertension and obesity during 12 weeks. Therefore, the SMEP can be applied in health care setting for the regular care in this group to decrease risk of chronic disease. Community health nurses could be trained to provide the program for the participants in their catchment area and nurses should encourage participants' families to motivate the participants performing exercise following the program. To maintain exercise need, an exercise diary is an important instrument to motivate the participants engaging in and continuing exercise. Nurses can implement the SMEP for persons with prehypertension and obesity to evaluate the effectiveness of this program in long-term for physical fitness enhancement, and reduce risk of hypertension. Moreover, nurses can enlist cooperation from multidisciplinary teams to ensure behavioral change in this population.

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References

1. Akephalakorn V, Pakchareon H, Thaikla K, Satiannophakao W. Thailand health survey by physical examination. Bangkok: Aksorn Graphic & Design; 2014.
2. World Health Organization. The Asia-Pacific perspective: Redefining obesity and its treatment. Melbourne: Health Communications; 2000.
3. American College of Sports Medicine. ACSM's health-related physical fitness assessment manual. Philadelphia: Lippincott Williams & Wilkins; 2014.
4. Niemann C, Godde B, Voelcker-Rehage C. Not only cardiovascular, but also coordinative exercise increases hippocampal volume in older adults. Frontiers in Aging Neuroscience. 2014; 6: 1-12.
5. Pescatello LS. Effects of exercise on hypertension. New York: Springer; 2015.
6. National Statistical Office. The 2015 physical activity survey. Bangkok: National Statistical Office; 2015.
7. Hoare E, Stavreski B, Jennings GL, Kingwell BA. Exploring motivation and barriers to physical activity among active and inactive Australian adults. Sports. 2017; 5(3): 1-8.
8. Corbin CB, Le Masurier G. Fitness for Life. Champaign: Human Kinetics; 2014.
9. Mansfield A, Knorr S, Poon V, Inness EL, Middleton L, Biasin L, et al. Promoting Optimal Physical Exercise for Life: An Exercise and Self-Management Program to Encourage Participation in Physical Activity after Discharge from Stroke Rehabilitation: A Feasibility Study. Stroke Research and Treatment. 2016; 30: 1-5.
10. Garnett A, Ploeg J, Markle-Reid M, Strachan PH. Self-Management of Multiple Chronic Conditions by Community-Dwelling Older Adults: A Concept Analysis. SAGE Open Nursing. 2018; 4: 1-16.
11. Wattanakul S, Theeraviwat M, Imamee N, Tansakul S. Learning program for self-management on diet and exercise of persons with pre-hypertension, Burirum province. Journal of Public Health Nursing. 2013; 27(1): 52-61.

12. Walsh NE, Mitchell HL, Reeves BC, Hurley MV. Integrated exercise and self-management programmes in osteoarthritis of the hip and knee: a systematic review of effectiveness. Physical Therapy Reviews. 2006; 11(4): 289-97.
13. Kanfer FH, Goldstein AP. Helping people change: A textbook of methods. Pergamon Press; 1991.
14. Thatsaeng B, Lasuka D, Khampolsiri T. Effects of a self-management supporting program on self-management behaviors and blood pressure among elders with hypertension. Nursing Journal. 2012; 39(4): 124-137
15. Song HY, Nam KA. Effectiveness of a stroke risk self-management intervention for adults with prehypertension. Asian Nursing Research. 2015; 9(4): 328-35.
16. Chaiwong, C, Sumethanurakkhakul, W, Raknatee, D, Warawitsaranggoon, Prayoonsirisak. The effect of self-management program on physical fitness and pain among people with knee osteoarthritis. Journal of Nursing and Health Care. 2016; 34 (4): 133-41.
17. Pettman TL, Misan GM, Owen K, Warren K, Coates AM, Buckley JD, et al. Self-management for obesity and cardio-metabolic fitness: Description and evaluation of the lifestyle modification program of a randomized controlled trial. International Journal of Behavioral Nutrition and Physical Activity. 2008. 5(1): 1-15.
18. American College of Sports Medicine. ACSM's guidelines for exercise testing and prescription. Lippincott Williams & Wilkins; 2013.
19. Garber CE, Blissmer B, Deschenes MR, Franklin BA, Lamonte MJ, Lee IM, et al. Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: guidance for prescribing exercise. Medicine & Science in Sports & Exercise. 2011; 43(7): 1334-59.
20. Faselis C, Doumas M, Kokkinos JP, Panagiotakos D, Kheirbek R, Sheriff HM, et al. Exercise Capacity and Progression from Prehypertension to Hypertension Novelty and Significance. Hypertension. 2012; 60(2): 333-8.
21. Rasamejam, P, Akaratanapol, P, Durongritichai, V. Factors predicting prehypertension and non-essential hypertension in Thai adult at Naklier community, Prasamutjedee, Samutprakarn province. Journal of Public health Nursing. 2013; 27(1): 103-114.
22. Guo X, Zhang X, Hu J, Sun Y, Zheng L, Sun Z, Zou L, Li J. The prevalence and heterogeneity of prehypertension: A meta-analysis and meta-regression of published literature worldwide. Cardiovascular Journal of Africa. 2012; 3(1): 44-50.
23. Landsberg L, Aronne LJ, Beilin LJ, Burke V, Igel LI, Lloyd-Jones D, et al. Obesity-related hypertension: Pathogenesis, cardiovascular risk, and treatment: A position paper of The Obesity Society and the American Society of Hypertension. Obesity. 2013; 21(1): 8-24.
24. Jang SY, Ju EY, Choi S, Seo S, Kim DE, Kim DK, et al. Prehypertension and obesity in middle-aged Korean men and women: the third Korea national health and nutrition examination survey (KNHANES III) study. Journal of Public Health. 2012; 34(4): 562-9.
25. Wakabayashi I. Stronger associations of obesity with prehypertension and hypertension in young women than in young men. Journal of Hypertension. 2012; 30(7): 1423-9.
26. Ferguson TS, Younger N, Tulloch-Reid MK, Lawrence-Wright MB, Forrester TE, Cooper RS, et al. Progression from prehypertension to hypertension in a Jamaican cohort: incident hypertension and its predictors. The West Indian medical journal. 2010; 59(5): 486-93.
27. Panagioti M, Richardson G, Small N, Murray E, Rogers A, Kennedy A, et al. Self-management support interventions to reduce health care utilisation without compromising outcomes: a systematic review and meta-analysis. BMC Health Services Research. 2014; 14(1): 1-14.
28. Masuki S, Morikawa M, Nose H. Interval walking training can increase physical fitness in middle-aged and older people. Exercise and Sport Sciences Reviews. 2017; 45(3): 154-62.
29. Higgs C, Skinner M, Hale L. Outcomes of a community-based lifestyle programme for adults with diabetes or pre-diabetes. Journal of Primary Health Care. 2016; 8(2): 130-9.
30. Government of Nakhon Pathom. [Internet]. Annual report 2017. [cited 2018, January 2]. Available from: http://www.nakhonpathom.go.th/news_describe.
31. Ministry of Public Health. [Interner]. Key performance indicators 2017. [cited 2018, March 12]. Available from: http://healthkpi.moph.go.th/

32. Samahito, S. Construction Physical Fitness Test and Norms for Thai of Age 19-59. Bangkok: Sport Science Bureau; 2013.
33. Reed JL, Pipe AL. The talk test: A useful tool for prescribing and monitoring exercise intensity. Current Opinion in Cardiology. 2014; 29(5): 475-80.
34. Cohen J. A power primer. Psychological Bulletin. 1992; 112(1):155-9.
35. Akoko BM, Fon PN, Ngu RC, Ngu KB. Knowledge of hypertension and compliance with therapy among hypertensive patients in the Bamenda Health District of Cameroon: A cross-sectional study. Cardiology and Therapy. 2017; 6(1): 53-67.
36. Methakanjanasak P, Methakanjanasak N, Sajja S. The effect of exercise self-management on physical fitness and blood pressure among adults with prehypertension. Journal of Nursing and Health Care. 2014; 32(3): 40-49.
37. Thutsaringkarnsakul S, Aungsuroch Y, Jitpanya C. Self-management program on blood pressure control in Thai hypertensive patients at risk for stroke: A randomized controlled trial. Journal of Health Research. 2012; 26(5): 243-249.
38. Suwankruhasn N, Pothiban L, Panuthai S, Boonchuang P. Effects of a self-management support program for Thai people diagnosed with metabolic syndrome. Pacific Rim International Journal of Nursing Research. 2013; 17(4): 371-83.
39. Conn VS, Hafdahl AR, Mehr DR. Interventions to increase physical activity among healthy adults: meta-analysis of outcomes. American Journal of Public Health. 2011; 101(4): 751-8.
40. Brady TJ, Murphy L, O'Colmain BJ, Beauchesne D, Daniels B, Greenberg M, et al. Peer reviewed: A meta-analysis of health status, health behaviors, and health care utilization outcomes of the chronic disease self-management program. Preventing Chronic Disease. 2013; 10: 1-14.

ผลของโปรแกรมการจัดการตนเองด้านการออกกำลังกายต่อสมรรถภาพทางกายของผู้ที่มีภาวะก่อนความดันโลหิตสูงและอ้วน

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บทคัดย่อ: การขาดการออกกำลังกายสัมพันธ์กับการจัดการตนเองที่ไม่เพียงพอซึ่งนำไปสู่การมีระดับสมรรถภาพทางกายต่ำในผู้ที่มีภาวะก่อนความดันโลหิตสูงและอ้วน การจัดการตนเองมีความสำคัญในการเพิ่มการออกกำลังกายด้วยการเริ่มต้นจากการเปลี่ยนแปลงพฤติกรรมจนสามารถปฏิบัติได้อย่างยั่งยืน การศึกษานี้เป็นการศึกษาผลของโปรแกรมการจัดการตนเองด้านการออกกำลังกายต่อสมรรถภาพทางกายของผู้ที่มีภาวะก่อนความดันโลหิตสูงและอ้วน กลุ่มตัวอย่างทั้งหมด จำนวน 32 ราย สุ่มเข้ากลุ่มทดลอง จำนวน 16 ราย ได้รับโปรแกรมการจัดการตนเองด้านการออกกำลังกาย และกลุ่มควบคุม จำนวน 16 ราย ได้รับการดูแลตามปกติ กลุ่มตัวอย่างทั้งหมดได้รับการประเมินสมรรถภาพทางกายด้วยวิธีการก้าวเป็นจังหวะ 3 นาที การยืนนั่งบนเก้าอี้ 60 วินาที และการนั่งงอตัวไปข้างหน้าก่อนและหลังเข้าโปรแกรม 12 สัปดาห์ วิเคราะห์ข้อมูลด้วยสถิติบรรยาย การทดสอบไคสแควร์ การทดสอบทีอิสระ และการทดสอบทีคู่

ผลการศึกษา พบว่า กลุ่มทดลองมีสมรรถภาพทางกายสูงกว่าก่อนเข้าโปรแกรม และกลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ โปรแกรมการจัดการตนเองด้านการออกกำลังกายสามารถเพิ่มระดับสมรรถภาพทางกายในผู้ที่มีภาวะก่อนความดันโลหิตสูงและอ้วนได้อย่างมีประสิทธิภาพทั้งทางด้านความอดทนของระบบไหลเวียนเลือด ความอดทนของกล้ามเนื้อ และความอ่อนตัว พยาบาลสามารถประยุกต์โปรแกรมนี้เพื่อเพิ่มระดับสมรรถภาพทางกายในประชาชนกลุ่มดังกล่าวได้ โดยการเพิ่มพฤติกรรมการออกกำลังกายผ่านทักษะการจัดการตนเอง การศึกษาครั้งต่อไปควรประเมินผลของโปรแกรมต่อสมรรถภาพทางกายในระยะเวลาที่ยาวนานมากขึ้น

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คำสำคัญ: การออกกำลังกาย ภาวะอ้วน สมรรถภาพทางกาย ภาวะก่อนความดันโลหิตสูง การจัดการตนเอง

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Effectiveness of the Strengthening Diabetes Care Program: A Randomized Controlled Trial with Thai Nurse Practitioners

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Abstract : This randomized control trial examined the effects of a strengthening diabetes care program among Thai nurse practitioners working in a diabetic clinic at primary care units in a province in northern Thailand. The program was developed in three stages: 1) Self-administered questionnaires for analysis of the nurse practitioners' competency in diabetes care management 2) Development of program contents to strengthen their competencies with five modules for classroom training and three modules for e-learning program, and 3) A 4-week intervention, which comprised four consecutive days for classroom training and three weeks for an e-learning program. The program was evaluated three times: pre-intervention and weeks 4 and 8 post-intervention. Sixty NPs were randomly assigned into experimental group (n=30) and control group (n=30). Data were collected with five self-administered questionnaires on demographic data form, perceived self-efficacy, outcome expectancy, knowledge, and care skills in diabetes care, and analyzed by using descriptive statistics, Repeated Measures ANOVA and Independent t-test.

The findings revealed significant increases in mean scores of the experimental group on perceived self-efficacy, outcome expectancy, knowledge and skills in diabetes care higher than the control group at weeks 4 and 8 post-intervention. Based on the findings, the diabetes program can be used to strengthen nurse practitioners'competencies to build their confidence in diabetes care at primary care units with short course training and a subsequent e-learning program suitable for self-directed learning. Supervision should be monitored to help nurse practitioners in effective job performance.

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Keywords: Competency, Diabetes mellitus, E-learning, Nurse practitioners, Primary care, Randomized controlled trial.

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Introduction

Diabetes mellitus (DM) is a major non-communicable disease leading to public health issues, clinical problems and economic burdens in Thailand.[1-3] Nurse practitioners (NPs) working at primary care

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units (PCUs) play key roles in case management for people with diabetes, particularly those living in communities.[4,5] The roles of NPs including diabetes diagnosis, basic treatment under the supervision of a physician and the laws of the Thailand Nursing and Midwifery Council (TNMC), counseling, health promotion, home visits, referrals, and education in the diabetes mellitus (DM) clinic, but also visiting people with adverse complications including nephropathy, neuropathy and retinopathy at their homes, if needed.[4-6] However, the number of NPs is insufficient when compared to the number of people with diabetes living in communities, and this number rises every year.[6,7] In Thailand, the current population is 62 million; 1.8 million are expected to have DM during their lifetimes.[3] Approximately 90% of people with diabetes have type 2 DM, which is similar to the world prevalence.[1,2]

A province in the north of Thailand was chosen for this study since it has the highest prevalence of diabetes of 31,267 people, with a ratio of 1,801 persons with diabetes per 10,000 population.[8] This province has established DM clinics to provide care and support the NPs working at PCUs and DM clinics. Moreover, NPs' competencies are insufficient in treatment, complications assessment, interpretation of laboratory test results, case management, foot care, innovation, and research application to practice in care management for persons with diabetes.[9,10]

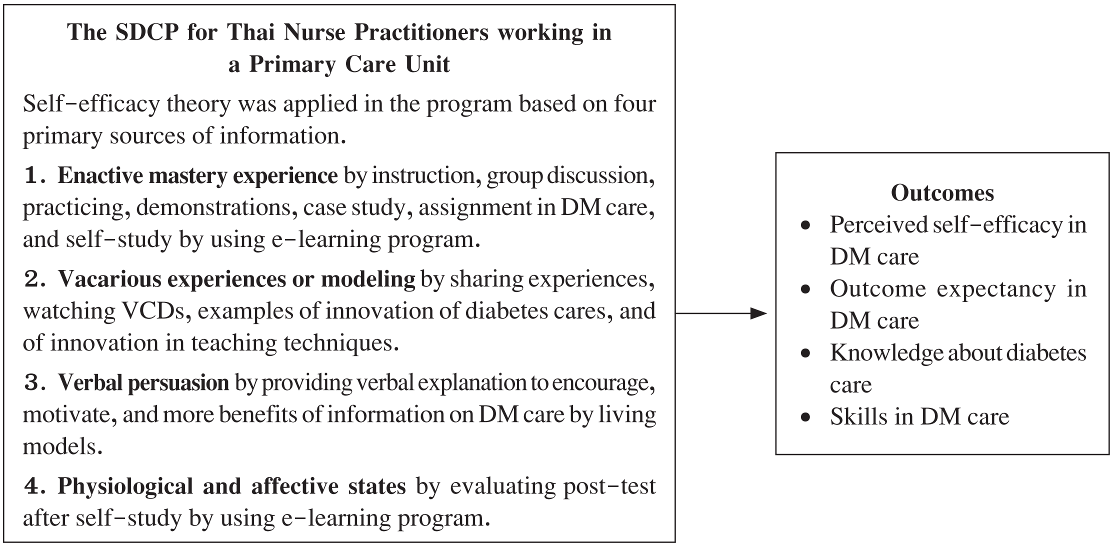
In order to support the Thai national policy on universal health care coverage at the primary care level, the TNMC envisions that nurses should be at the frontier in providing primary care to people with chronic conditions. Therefore, the TNMC and many schools of nursing have launched 4-month nursing training programs to increase competency in NPs who generally work in the community as primary care providers.[4] In general, the content is composed of advanced health assessment, primary medical and emergency care, leadership management, and health system policy. Noticeably, chronic disease, particularly DM care and management, are only one topic in the primary medical care course.[11] A review of studies in Thailand and developed countries, has revealed that most NPs do not feel confident in their abilities to take care of those with diabetes in the community and need to gain more training in DM management.[9,10,12-17] Therefore, strengthening DM care management programs for NPs is necessary, particularly for those who work in remote areas. This study tested the effectiveness of a strengthening diabetes care program (SDCP) based on self-efficacy theory for the development of a DM care program for Thai NPs at primary care units. The activities consisted of four consecutive days of training sessions and three weeks for self-study with an e-learning program that had not yet been integrated in DM care programs and had new challenges for nurse educators.[18,19]

Literature Review and Conceptual Framework

In Thailand, the roles of NPs were established in response to a physician shortage in primary care units. The National Health Security Office (NHSO) and TNMC promptly responded to health care reform in 2002 by carrying out strategies to assure health policy makers that nurses are the appropriate health care providers at the primary care level.[4] The major role of NPs is to provide integrative care which includes health promotion, prevention, and cure of minor or common local health problems in addition to rehabilitation services for people near their homes and care for people at the end of their life.[4,5] The TNMC took the lead in responding to this need.

Self-efficacy has been successfully used as a framework for increasing people's confidence in performing a specific behavior; the stronger an individual's belief in their abilities to perform a course of action, and in the positive outcomes of that action, the more likely they will initiate and persist in a given activity. Then, they infer their capabilities from the imagined outcomes which precede the actions.[20] This is called self-efficacy, the theory of which was used as the conceptual framework in developing programs to improve knowledge, skills and self-efficacy in the job performance and care provided by NPs.[21-28] Strategies included four principal sources of information composed of enactive mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states.[20] A review of studies, in Thailand and developed countries, revealed that most interventions for developing programs used four principal sources of information (direct experience, reflection, observation, role play, and online instruction). Furthermore, the results revealed significant differences in knowledge, skills and self-efficacy achieved after receiving a variety of interventions.[21-28]

The SCPD program was developed based on NPs' competency in DM care management, a literature review and self-efficacy theory. The process of program development involved five steps based on the following curriculum development of Uys & Gwele[29]: 1) establish the context and foundations; 2) formulate the outcomes or objectives; 3) select a curriculum model and develop a macro-curriculum; 4) develop the micro-curriculum; and 5) plan for the evaluation of implementation and outcomes. The activities were composed of training and an e-learning program. The training methods included instruction, case studies, group discussion, demonstration and practical skills, and experience sharing with a live model and reinforcement by offering praise and encouragement via living models. Moreover, this program included an e-learning program as an appropriate learning method with support for concepts known as life-long learning, anywhere-anytime learning, greater efficiency in accumulating knowledge, and building cognitive skills in an environment where everyone can learn at their own place and take their time to learn what they need to know.[30,31] In addition, the e-learning program offer new challenges for nurse educators.[18,19] NPs who work in remote areas can study by self-directed learning at their own place for reviewing knowledge about DM care. Previous e-learning programs had not been integrated in DM care programs, and thus the SDCP in this study was designed to be suitable for NPs working in remote areas to help bridge the gap in DM care at primary care units. In summary, the literature review was synthesized into a conceptual framework as shown in **Figure 1**.



The SDCP for Thai Nurse Practitioners working in a Primary Care Unit

Self-efficacy theory was applied in the program based on four primary sources of information.

1. **Enactive mastery experience** by instruction, group discussion, practicing, demonstrations, case study, assignment in DM care, and self-study by using e-learning program.
2. **Vacarious experiences or modeling** by sharing experiences, watching VCDs, examples of innovation of diabetes cares, and of innovation in teaching techniques.
3. **Verbal persuasion** by providing verbal explanation to encourage, motivate, and more benefits of information on DM care by living models.
4. **Physiological and affective states** by evaluating post-test after self-study by using e-learning program.

Outcomes

- Perceived self-efficacy in DM care
- Outcome expectancy in DM care
- Knowledge about diabetes care
- Skills in DM care

Figure 1. Conceptual Framework of this Study

Hypothesis

After finishing the program, NPs in the experimental group would have significantly higher mean scores on perceived self-efficacy, outcome expectancy, knowledge about diabetes, skills in DM care than that at the beginning of the program, and higher than that of control group at the fourth and eighth weeks after intervention.

Method

Design: A randomized control trial.

Sample and Setting: The population consisted of NPs who had responsibility in DM clinics at primary care units in northern Thailand from November 2014 to February 2015. They were recruited if they met the following inclusion criteria: 1) had worked full-time in a DM clinic at a PCU for at least one year; and 2) were computer literate. The exclusion criteria were those who worked part-time in DM clinics, or were unable to participate in all processes.

The sample size calculation of Polit & Beck[32] using power analysis was employed to reduce the risk of type II error. The minimum level of significance (α) to estimate the number of sample size was .05 with the power of .80 (1-ß), a medium effect size, which would yield a total sample size of n= 50 (n=25 per condition, for a total of two conditions). Anticipating potential bias due to dropouts and the desire to prevent possible low power to detect small differences, the principal investigator (PI) recruited 25% additional participants which added seven more participants in each group for a total sample size of n=64 (n=32 per condition).

The PI screened an initial sample of NPs who presented at 272 PCUs. A total of 215 eligible participants were initially approached; 135 did not meet the criteria and 17 were unable to participate in all processes of this study. Therefore, 64 participants were randomly assigned either to the experimental or the control group using simple random sampling. During the study period, 4 participants discontinued the study. In the experimental group, 2 participants were not able to participate in classroom training and 2 participants in control group had moved out of the area during data collection. The final number of participants used for data analyses were 30 in both groups (**Figure 2**).

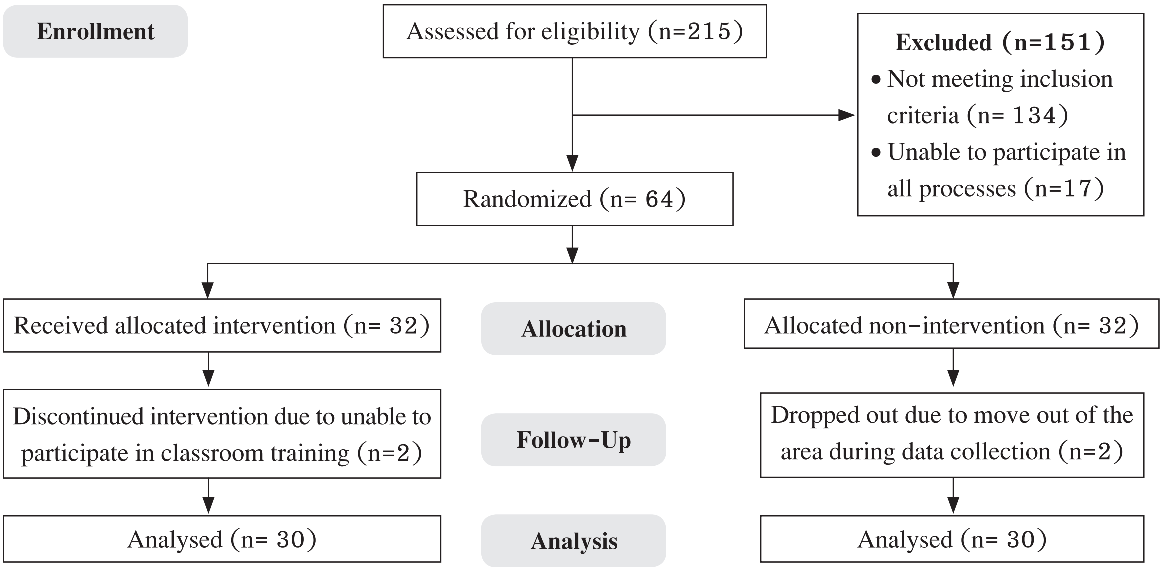


Figure 2. Flow diagram of participants in randomized controlled trial

Ethical Considerations: This study was granted approval by the Research Ethics Committee of the Faculty of Public Health, Mahidol University (MUPH 2013-134) prior to data collection. All NPs who met the inclusion criteria were provided detailed information regarding the research objectives, intervention and preservation of confidentiality and anonymity. Next, all of the participants signed a written informed consent form as a voluntary agreement to participate in the research. The participants' rights were protected throughout the study. The control group who did not receive this intervention was allowed to take the same program as those in the experimental group after the experiment if they wanted to.

Instruments: Five instruments in this study were developed by PI and examined for content validity by five experts (two public health nurse instructors, one educational administration instructor, one instructor in the curriculum for NPs related to primary medical care and one public health instructor) using the content validity index (CVI) between 0.8 and 1.0. The internal consistency reliability was tested with 30 participants, who met the same inclusion criteria as the study participants. Perceived self-efficacy, outcome expectancy, and skills in DM care questionnaires were developed based on the literature reviews of self-efficacy theory and five domains of core competencies of NPs released by the Thailand Nursing and Midwifery Council.[33] Knowledge about diabetes care was developed based on a handbook and clinical practice guideline for diabetes from the Diabetes Association of Thailand, The Endocrine Society of Thailand, Department of Medical Services, National Health Security Office, and American Diabetes Association.[34,35] All questionnaires were described below:

A demographic questionnaire collected data on age, gender, marital status, educational level, duration after completing short course, Program of Nursing Specialty in Nurse Practitioner (Primary Medical Care), and work experience in DM clinic at primary care unit.

Perceived Self-efficacy in DM Care was used to evaluate the NPs′ confidence in performing DM care at PCUs. The questionnaire contains 20 items with 5-point Likert scales. The scores range from 0 (definitely not confident) to 4 (definitely confident) with total scores ranging from 0 to 80 points. Higher scores indicate higher confidence in performing DM care at PCU. Examples of items are: "You can assess the risk for diabetes and interpret the risk score" and "You can conduct screening and diagnosis in diabetes patients". In this study, the Cronbach's alpha was 0.87.

Outcome Expectancy in DM Care was used to evaluate the outcome expectations in NP performance in DM care at PCUs. The questionnaire contains 15 items with 5-point Likert scales. The scores range from 0 (totally disagree) to 4 (totally agree), with total scores ranging from 0 to 60 in which higher scores indicate higher outcome expectations for performing DM care at PCUs. Examples of items are: "If I practice early diagnosis in diabetes patients, the complications of the disease can be prevented" and "If I use innovations in DM care, complications can be reduced ". In this study, the Cronbach's alpha was 0.94.

Skills in DM Care was used to evaluate the NPs' skills in performing DM care at PCUs. The questionnaire contains 20 items with 5-point Likert scales. The scores range from 1 (very low) to 5 (very well) with total scores ranging from 1 to 100 in which higher scores indicate higher skills in performing DM care at PCUs. An example of items is: "You can assess the foot of person with diabetes by using Semmes-Weinstein monofilament test". In this study, the Cronbach's alpha was 0.93.

Knowledge about Diabetes Care was used to evaluate the NPs' knowledge in diabetes care at PCUs. The questionnaire consists of 20 items and a four-multiple choice test. Participants were required to respond to all of the items by selecting only one answer. The participants received 1 point for each correct answer. The scores range from 0 to 20 in which higher score indicates higher knowledge about diabetes care. An example of items is: "Based on the information of the case study, nurse practitioner can assess and interpret the risks of diabetes and advised in this case...?" In this study, the Kuder-Richardson Formula 20 was 0.80.

Intervention Program: This intervention was developed by the PI based on Uys and Gwele's curriculum development[29] and Bandura's self-efficacy theory[20]. The content validity of the program was reviewed by 5 experts (two public health nurse instructors, one educational administration instructor, one instructor in the curriculum for NPs related to primary medical care and one public health instructor), and revised according to their recommendation. It was pilot tested for understanding and program practicality with five NPs who met the inclusion criteria but did not participate in the main study.

The program has three phases. During Phase 1, the PI surveyed the perceived competency of 135 NPs in DM care management at a primary care unit in northern Thailand by self-administered questionnaires composed of the following five domains: (1) management of patient health/illness status; (2) NP-patient relationships; (3) Teaching-coaching functions; (4) professional roles; and (5) managing and negotiating the health care delivery system. The results indicated that overall NP competencies were moderate when considered individually; two domains, namely, NP-patient relationships and managing and negotiating health care delivery system had high levels of competency and three domains, namely, management of patient health/illness status, teaching-coaching functions and professional roles had moderate levels of competency. Moreover, the NPs were concerned about DM training and a general lack of DM knowledge in addition to low confidence in DM practice (e.g., clinical practice guidelines for DM, case management, communication skills and teaching techniques).

As shown in **Table 1**, the SDCP was conducted based on information from the previous phase by using Bandura's self-efficacy theory as a conceptual framework. The intervention was conducted between Weeks 1 to 4 to increase the level of perceived self-efficacy, outcome expectancy, knowledge and skills in DM care among NPs. The strategy was emphasized the four primary sources of information from Bandura's self-efficacy theory including: (1) enactive mastery experience; (2) vicarious experiences; (3) verbal persuasions and (4) physiological and affective states. At Week 1, the program was composed of four consecutive days for classroom training with five modules including the following: (1) diabetes and complications; (2) clinical practice guidelines for diabetes; (3) case management; (4) communication skills and (5) teaching techniques. The teaching methods included instruction, group discussion, practicing, demonstration, case study, assignment, sharing experiences with role models, watching VCD with examples of innovations in DM care, and teaching techniques as well as reinforcement by praise and encouragement with beneficial information via living models. For Weeks 2 to 4, the e-learning program was conducted with the following three modules: (1) Semmes-Weinstein monofilament test; (2) self-monitoring of blood glucose and (3) case management. All teaching methods emphasized self-study, pre-test and post-test.

Table 1: Content and methods for the Strengthening Diabetes Care Program (SDCP).

Time Schedule	Competency domain	Module & contents	Strategies	Teaching Method
Week 1 (4 days) 6 hrs/day	MPI	**Classroom Instruction:** Module 1: Diabetes and complications Module 2: Clinical practice guidelines for diabetes - Medical regimen - Diagnosis, assessment, treatment, and prevention of hypo-and hyperglycemia in diabetic patients	Enactive mastery experience	1) Instruction 2) Group discussion 3) Practicing 4) Demonstrations 5) Case study 6) Assignment

Table 1: Content and methods for the Strengthening Diabetes Care Program (SDCP). (Cont.)

Time Schedule	Competency domain	Module & contents	Strategies	Teaching Method
		- Investigation of guidelines for DM complications - Practice guidelines for DM foot care	Vicarious experience	1) Sharing experiences 2) Watching VCDs 3) Examples of innovation of diabetes cares 4) Examples of innovation of teaching techniques
	PR&MNH	Module 3: Case management		
	NPR	Module 4: Communication skills		
	TCF	Module 5: Teaching techniques		
			Verbal persuasion	Provide appreciation and more benefit information
Week 2 (1 week/ Any time)	MPI	**E-learning module education:** Module 1: Semmes-Weinstein monofilament test. - Definition and benefits	Enactive mastery experience	Self-study
		- Techniques and method	Physiological and affective states	Post-test feedback
Week 3 (1 week/ Any time)	TCF	**E-learning module education:** Module 2: Self-monitoring of blood glucose (SMBG)	Enactive mastery experience	Self-study
		- Definition and benefits of SMBG. - Indication of SMBG - How to use the SMGB in patients with diabetic	Physiological and affective states	Post-test feedback
Week 4 (1 week/ Any time)	PR&MNH	**E-learning module education :** Module 3: Case management - Definition of case management	Enactive mastery experience	Self-study
		- Role of nurse case management in DM care - Case management in diabetic patients: - High risk cases - Diabetic cases - Complication cases	Physiological and affective states	Post-test feedback

Note: MPI = management of patients' health/illness status; NPR= Nurse practitioner- patient relationship; TCF = teaching -coaching function; PR= professional roles; MNH= managing and negotiating health care system

Data collection: Participants who met the inclusion criteria were approached, and informed the purpose of study. After obtaining informed consent, they were asked to complete the self-administered questionnaires. The experimental group received a 4-week intervention composed of four consecutive days for classroom training and three weeks for the e-learning program, whereas the control group did not receive any intervention. Data were collected at the beginning, Weeks 4 and 8.

Data Analysis: Statistical analyses employed SPSS 18.0 statistical package for Windows (Bangkok, Thailand). Descriptive statistics including percentage, mean, and standard deviation, were used to describe the participants' characteristics. Repeated Measures ANOVA and Independent *t*-test were used to evaluate the differences in mean score of the data between the experimental and control groups at baseline and at Weeks 4 and 8 post-intervention. All statistical significance was defined as $p < .05$.

Results

Totally, 60 nurses completed the program with 30 in the experimental group and 30 in the control group. As shown in **Table 2**, the mean age of experimental and control groups was 43 (SD = 7.6) and 46 (SD = 7.6) years old, respectively. The majority of participants in both groups were married female and almost all held a bachelor degree. The average years since short course training as NP was 3.69 years (SD = 2.7) for the experimental group, and 5.38 years (SD = 3.4) for the control group. The mean work experience in a DM clinic in primary care unit for experimental and control groups were 6.2 (SD = 4.4) and 9.4 (SD = 6.97) years, respectively. There were no significant differences between the groups with regard to age, duration after complete the short course and work experience in DM clinics as presented, whereas gender, marital status and education level were significantly different.

Table 2 Socio-demographic characteristics of the experimental and control groups.

Characteristic	**Experimental group (n= 30)**	**Control group (n=30)**	***p-value***
Age (years), mean (SD)	42.6 (7.6)	45.7 (7.6)	0.066 ^{b}
Gender, N (%)			
Male	-	1 (3.3)	0.000^{*a}
Female	30 (100)	29 (96.7)	
Marital status, N (%)			
Single	4 (13.3)	1 (3.3)	0.000*^{a}
Married	24 (80.0)	23 (76.7)	
Separate	2 (6.7)	6 (20.0)	
Education level, N (%)			
Bachelor degree	28 (93.3)	22 (73.3)	0.000^{*a}
Master degree	2 (6.7)	8 (26.7)	
Duration after complete short course (years), mean (SD)	3.69 (2.7)	5.38 (3.4)	0.823^{b}
Work experience in DM clinics (years), mean (SD)	6.23 (4.4)	9.43 (6.9)	0.106 ^{b}

Note: * $p < .05$; a = Chi-Square test ; b = Independent *t*-test

When performing Repeated Measures Two-Way ANOVA, the mean scores for perceived self-efficacy, outcome expectancy, knowledge and skills in DM care showed significant differences between the experimental and control groups (F test = 94.88, 31.91, 24.97 and 10.16, respectively) ($p < .001$) (**Table 3**).

Findings from the independent *t*-test data analysis at baseline showed that there were no differences in perceived self-efficacy, outcome expectancy, knowledge and skills in DM care between experimental and control groups ($p = 0.065, 0.216, 0.179$, and 0.218, respectively). At Week 4, the mean scores of all variables in the experimental group were significantly higher than the control group ($p = 0.007, 0.001, 0.005$, and 0.005, respectively). Also at Week 8, the mean scores of all variables in the experimental group were significantly higher than the control group ($p = 0.002, 0.001, 0.001$ and 0.005, respectively) (**Table 4**).

Table 3 Mean Scores Difference, Across Time, between and within groups.

Source of variables	SS	df	MS	F	p-value
Perceived self- efficacy in DM care [b]					
Between groups					
Groups	4784.36	1	4784.36	94.88	< 0.001**
Between groups error	2924.76	58	50.43		
Within groups					
Time	2887.34	1.00	2878.93	33.87	< 0.001**
Group * Time	1194.74	1.00	1191.26	14.01	< 0.001**
Within groups error	4944.58	58.17	85.00		
Outcome expectancy in DM care [b]					
Between groups					
Groups	1301.42	1	1301.42	31.91	< 0.001**
Between groups error	2365.16	58	40.78		
Within groups					
Time	524.41	1.02	513.71	18.89	< 0.001**
Group * Time	724.34	1.02	709.56	26.09	< 0.001**
Within groups error	1609.91	59.21	27.19		
Knowledge in diabetes care [c]					
Between groups					
Groups	355.61	1	355.61	24.97	< 0.001**
Between groups error	826.01	58	14.24		
Within groups					
Time	455.70	2	227.85	89.83	< 0.001**
Group * Time	403.41	2	201.71	79.54	< 0.001**
Within groups error	294.22	116	2.51		
Skills in diabetes care [b]					
Between groups					
Groups	2486.45	1	2486.45	10.16	0.002*
Between groups error	14192.28	58	244.69		
Within groups					
Time	3974.58	1.48	2680.90	18.82	< 0.001**
Group * Time	1153.60	1.48	778.12	5.46	0.011*
Within groups error	12247.16	85.99	142.43		

Note : [a] = Two- way repeated measure ANOVA; [b] = Greenhouse-Gesser ; [c] = Sphericity Assumed;
* p < .05; **p < .001

Table 4 The difference of outcomes between experimental and control groups

Data	Mean (SD)		p-value
	Experimental group	Control group	
Perceived self-efficacy			
Baseline	57.96 (6.4)	54.93 (11.2)	0.065
Week 4	71.60 (3.6)	57.96 (6.4)	0.007*
Week 8	72.23 (3.2)	57.96 (6.4)	0.002*
Week 4 - baseline	13.63 (7.4)	3.03 (14.2)	0.001*
Week 8 - baseline	14.26 (7.1)	3.03 (14.2)	0.001*
Outcome expectancy			
Baseline	47.10 (4.7)	47.36 (5.5)	0.216
Week 4	54.80 (4.8)	47.10 (4.7)	0.001*
Week 8	55.10 (4.6)	46.40 (4.4)	0.001*
Week 4 - baseline	7.70 (5.0)	-0.26 (7.8)	0.009*
Week 8 - baseline	8.00 (4.9)	-0.96 (7.4)	0.012*
Knowledge			
Baseline	8.36 (1.9)	9.76 (2.9)	0.179
Week 4	14.73 (1.5)	10.20 (3.5)	0.005*
Week 8	15.06 (1.5)	9.76 (3.0)	0.001*
Week 4 - baseline	6.36 (2.1)	0.43 (1.9)	0.005*
Week 8 - baseline	6.70 (2.2)	0.00 (2.6)	0.018*
Skills			
Baseline	68.96 (9.9)	68.60 (20.9)	0.218
Week 4	83.63 (4.2)	73.66 (13.7)	0.005*
Week 8	84.83 (3.9)	72.86 (12.3)	0.005*
Week 4 - baseline	14.66 (11.7)	5.06 (20.8)	0.002*
Week 8 - baseline	15.86 (11.3)	4.26 (19.8)	0.011*

Note: Independent *t*-test.
* $p < .05$

Discussion

The findings showed the effectiveness of the program in strengthening competency in diabetes care among NPs. In the experiment group, this program significantly increased perceived self-efficacy, outcome expectancy, knowledge and skills in DM care at Weeks 4 and 8, compare to the baseline. In addition, when compared to the control group, the levels of perceived self-efficacy, outcome expectancy, knowledge and skills in DM care were statistically and significantly higher at Weeks 4 and 8. Therefore, the results confirm the effectiveness of the intervention of this program in enhancement of perceived self-efficacy, outcome expectancy, knowledge and skills by using the four strategies indicated by Bandura[20], namely, enactive mastery experience, vicarious experiences, verbal persuasion, and physiological and affective states. This finding is congruent with many studies in both Thailand and other countries revealing that four major sources of self-efficacy can increase knowledge, skills and self-efficacy in the job performance of nurses and health personnel.[21,25,36,37]

Interestingly, the intervention of this program was combined with an e-learning program. E-learning is a form of online learning that is a suitable method for continuing education, especially for individuals with a high degree of discipline in independent learning at remote locations based on personal needs and place.[30,31] This is also supported by a previous study that reported most public health nurses and health care professionals to believe that e-learning is beneficial for achieving life-long learning, fulfilling personal interests, offering time-saving, information diversity, flexibility in terms of time and space, self-regulatory learning and cost-effectiveness.[38] Moreover, e-learning can enhance learning, memory and practice due to repeatable contents.[39] Notably, since the e-learning program was made available on compact disks, participants could repeat material they required independently at their own place without a requirement for internet access. For the entire results of the evaluation, participants were satisfied and interested in the e-learning program.

In summary, the experimental group performed all modules that helped increase perceived self-efficacy, outcome expectancy, knowledge and skills in the DM care of NPs working in DM clinics at primary care units. Therefore, the SDCP for NPs may bridge the gap in diabetes care at primary care units. In the future, the effects of the SDCP should be investigated for long-term sustainability.

Limitations

When applying the research findings, limitations need to be taken into consideration for generalizability. First, participants were recruited from only primary care setting in one province of Thailand. Second, small numbers of participants in all groups were studied due to drop-outs during the intervention. Therefore, future studies need to consider the use of a larger number of primary care settings and larger sizes of participants located throughout the country.

Conclusion and Implications for Nursing Practice

The findings indicate that the SCDP is an effective program to strengthen the competencies of NPs to build confidence in DM care at primary care units. Therefore, the strengthening of NPs should be continued to build confidence in job performance at DM clinics. In the future, the effects of the SCDP should be integrated in the curriculum of the Program of Nursing Specialty in Nurse Practitioners (Primary Medical Care) in order to gain clinical expertise for DM and case management. In addition, public health administrators should support NPs to continuously acquire appropriate knowledge in DM care.

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References

1. International Diabetes Federation. IDF Diabetes Atlas, 7th ed. Brussels, Belgium : International Diabetes Federation, 2015 [cited 2018 Feb 25]. Available from: http://www. diabetes atlas.org.
2. World Health Organization. Global Report on Diabetes. Geneva : World Health Organization; 2016.
3. Ministry of Public Health. Annual report 2015. Bureau of Non- communicable Disease, Department of Disease Control. Bangkok: The war Veterans Organization of Thailand Under Royal Patronage of His Majesty the King; 2016.
4. Hanucharurnkul S. Nurses in primary care and the nurse practitioner role in Thailand. Contemp Nurse. 2007; 26 (1): 83-93.

5. Boontong T, Athaseri S, Sirikul N. Nurse practitioners role towards primary medical care in primary care setting. Thai J Nurs Res. 2007; 22(4): 24-37. [in Thai].
6. Mekwiwatanawong C, Hanucharurnkul S, Piaseu N, Nityasuddhi D. Comparison of outcomes of patients with diabetes receiving care by way of three primary care practice models. Pacific Rim Int J Nurs Res.2013; 17 (1): 39-55.
7. Sathira-Angkura T, Kongsin S, Intaraprasong B, Pattaraarchachai J, Jiamton S. Factors associated with the effectiveness of diabetes care at primary care settings. J Med Assoc Thai. 2011; 94 (12): 1513-20.
8. Chiang Mai Provincial Public Health Office. Non - communicable disease surveillance annual report 2014. Chiang Mai: Chiang Mai Provincial Public Health Office; 2014.
9. Phuangngoenmak S, Keawpan W, Pichayapinyo P, Hangwong U. Competencies of nurse practitioners working in diabetes mellitus clinic at primary care unit in Chiang Mai province. Journal of Nurses' Association of Thailand Northern. 2017; 23(1):11-20.
10. Siriphuwanun V, Juntarawijit Y, Udomvong N. Primary medical care of nurses at primary care unit in Chiang Mai province. Thai J Nurs Res. 2008; 23(1): 74-86. [in Thai].
11. Thailand Nursing and Midwifery Council. Curriculum of program of nursing specialty in nurse practitioner, 2014 [cited 2014 May 24].Available from: https://www.ccne.or.th.
12. Alotaibi A, Al-Ganmi A, Gholizadeh L, Perry L. Diabetes knowledge of nurses in different countries: An integrative review. Nurse Educ Today.2016; 39: 32-49.
13. Porcelis Vargas C, Karine Souza Lima D, Loyze da Silva D, Dornelles Schoeller S. Conduct of primary care nurses in the care of people with diabetic foot. J Nurs UFPE on line. 2017; 11(11): 4535- 45.
14. Daly B, Arroll B, Sheridan N, Kenealy T, Scragg R. Diabetes knowledge of nurse providing community care for diabetes patients in Auckland, New Zealand. Prim Care Diabetes.2014; 8(3): 215-23.
15. Hollis M, Glaister K, Lapsley JA. Do practice nurse have the knowledge to provide diabetes self-management education?. Contemp Nurse. 2014; 46(2): 234-41.
16. Ahmed A, Jabbar A, Zuberi L, Islam M, Shamin K. Diabetes related knowledge among residents and nurses: a multicenter study in Karachi, Pakistan. BMC Endocr Disord. 2012; 12(18):1- 5.
17. Eaton-Spiva L, Day A. Effectiveness of a computerized educational module on nurses' knowledge and confidence level related to diabetes. J Nurses Staff Dev. 2011; 27(6): 285-9.
18. Robina KA, Anderson ML. Online teaching efficacy of nurse faculty. J Prof Nurs. 2010; 26(3): 168-75.
19. Petit dit Dariel O, Wharrad H, Windle R. Exploring the underlying factors influencing e-learning adoption in nurse education. J Adv Nurs.2013; 69(6): 1289-300.
20. Bandura A. Self-efficacy: The exercise of control. New York: W.H. Freeman and Company; 1997.
21. Christain A , Krumwiede N. Simulation enhance self-efficacy in the management of preeclampsia and eclampsia in obstetrical staff nurses. Clin Simul Nurs. 2013; 9(9): 369 - 77.
22. Ammentorp J, Sabroe S, Kofoed PE, Mainz J. The effect of training in communication skills on medical doctors' and nurses' self - efficacy: A randomized controlled trail. Patient Educ Couns. 2007; 66(3): 270 -7.
23. Goetz K, Szecsenyi J, Campbell S, Rosemann T, Rueter G, Raum E,et al. The importance of social support for people with type 2 diabetes -a qualitative study with general practitioners, practice nurses and patients. Psychosoc Med. 2012; 9:1- 9.
24. Barta SK, Stacy RD. The effect of a theory-based training program on nurses' self - efficacy and behavior for smoking cessation counseling. J Contin Educ Nurs. 2005; 36(3): 117 -123.
25. Chang SH, Crogan NL, Wung SF. The self- care self-efficacy enhancement program for chinese nursing home elders. Geriatr Nurs. 2007; 28 (1): 31- 6.
26. Chen HM, Wang HH, Chen CH, Hu HM. Effectiveness of a stretching exercise program on low back pain and exercise self-efficacy among nurses in Taiwan: a randomized clinical trial. Pain Manag Nurs. 2014; 15(1): 283-91.
27. Bohman B, Ghaderi A, Rasmussen F. Training in methods of preventing childhood obesity increases self-efficacy in nurses in child health services: a randomized, control trial. J Nutr Educ Behav.2014; 46(3): 215-8.

28. Cohen SR, Cragin L, Wong B, Walker DM. Self- efficacy change with low-tech, high-
fidelity obstetric simulation training for midwives and nurses in Mexico. Clin Simul Nurs.2012; 8(1): 15-24.
29. Uys Leana R, Gwele Nomthandazo S. Curriculum development in nursing: process and innovations. London: Routledge; 2005.
30. Lahti M, Kontio R, Pitkanen A, Valimaki M. Knowledge transfer from an e-leaning course to clinical practice. Nurse Educ Today. 2014; 34(5): 842-7.
31. Hanwong U. Development of a local environment curriculum integrating process-oriented teaching methods for students studying in a multi-grade group. CMU Journal of Education. 2008; 34 (1): 135- 48. [in Thai].
32. Polit DF, Beck CT. Nursing research: generating and assessing evidence for nursing practice. 10th ed. Philadelphia : Wolters Kluwer Health; 2017.
33. Thailand Nursing and Midwifery Council. Characteristics and working situation of nurse practitioners in Thailand. Bangkok: Thailand Nursing and Midwifery Council; 2007.
34. Diabetes Association of Thailand, The Endocrine Society of Thailand, Department of Medical Services, National Health Security Office. Clinical Practice Guideline for Diabetes, Thailand 2014. Bangkok : Aroonkarnpim; 2014.
35. American Diabetes Association. Standards of medical care in diabetes - 2016. Diabetes Care. 2016; 39(Suppl 1) : S1 - S 109.
36. Prombutr P, Sookpool A, Phinyo K, Phinyo P. The effect of self-efficacy program toward knowledge and self-efficacy of village health volunteers in diabetic and hypertension patient care in community in northeast province. Songklanagarind Journal of Nursing. 2015; 35 (2) : 113-28. [in Thai].
37. Aliasghapour M, Shomali M, Moqhaddam MZ, Faqhihzadeh S. Effect of a self-efficacy promotion training programme on the body weight change in patients undergoing haemodialysis. J Ren Care. 2012;38(3): 155- 61.
38. Feng JY, Chang YT, Chang HY, Erdley WS, Lin CH, Chang YJ. Systematic review of effectiveness of situated e-learning on medical and nursing education. Worldviews Evid Based Nurs. 2013; 10 (3): 174 - 83.
39. Bristol TJ, Zerwekh J. Essentials of E-learning for nurse educators. Philadelphia, PA: F.A.Davis Company ; 2011.

ผลของโปรแกรมการเสริมสร้างสมรรถนะการดูแลผู้ป่วยโรคเบาหวาน การทดลองแบบสุ่มและมีกลุ่มควบคุมในพยาบาลเวชปฏิบัติ

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บทคัดย่อ: การวิจัยเชิงทดลองแบบสุ่มและมีกลุ่มควบคุมนี้ เพื่อทดสอบผลของโปรแกรมการเสริมสร้างสมรรถนะการดูแลผู้ป่วยโรคเบาหวานของพยาบาลเวชปฏิบัติ ที่ปฏิบัติงานในการดูแลผู้ป่วยโรคเบาหวาน ณ หน่วยบริการปฐมภูมิ จังหวัดหนึ่งในภาคเหนือของประเทศไทย โดยมีขั้นตอนของการพัฒนาโปรแกรม 3 ขั้นตอน คือ 1) วิเคราะห์สมรรถนะในการจัดการดูแลผู้ป่วยโรคเบาหวานของพยาบาลเวชปฏิบัติ จากแบบสอบถาม 2) พัฒนาเนื้อหาของโปรแกรมเพื่อเสริมสร้างสมรรถนะการดูแลผู้ป่วยโรคเบาหวานของพยาบาลเวชปฏิบัติประกอบด้วย 5 โมดูล สำหรับการฝึกอบรมเชิงปฏิบัติการในห้องเรียน และ 3 โมดูล สำหรับโปรแกรม e-learning 3) ดำเนินการทดลองโดยมีกิจกรรมทั้งหมด 4 สัปดาห์ สัปดาห์แรกเป็นการฝึกอบรมเชิงปฏิบัติการในห้องเรียนจำนวน 4 วันติดต่อกัน และอีก 3 สัปดาห์เป็นการศึกษาด้วยตนเองโดยใช้โปรแกรม e-learning และมีการติดตามประเมินผลเข้าร่วมโปรแกรม 3 ครั้ง คือ ก่อนเข้าร่วมโปรแกรม หลังเสร็จสิ้นการเข้าร่วมโปรแกรมสัปดาห์ที่ 4 และสัปดาห์ที่ 8 กลุ่มตัวอย่าง คือ พยาบาลเวชปฏิบัติ จำนวน 60 คน ถูกสุ่มเข้ากลุ่มทดลอง (n=30) และกลุ่มควบคุม (n= 30) เก็บรวบรวมข้อมูลโดยแบบสอบถามแบบตอบด้วยตนเอง จำนวน 5 ฉบับ ได้แก่ แบบสอบถามข้อมูลทั่วไป แบบสอบถามการรับรู้ความสามารถของตนเองในการดูแลผู้ป่วยโรคเบาหวาน แบบสอบถามความคาดหวังในการดูแลผู้ป่วยโรคเบาหวาน แบบทดสอบความรู้ในการดูแลผู้ป่วยโรคเบาหวาน และแบบสอบถามทักษะในการดูแลผู้ป่วยโรคเบาหวาน วิเคราะห์ข้อมูลโดยใช้สถิติ Repeated Measures ANOVA and Independent t-test.

ผลการวิจัยพบว่า กลุ่มทดลองมีคะแนนเฉลี่ยของการรับรู้ความสามารถของตนเองในการดูแลผู้ป่วยโรคเบาหวาน ความคาดหวังในการดูแลผู้ป่วยโรคเบาหวาน ความรู้ในการดูแลผู้ป่วยโรคเบาหวานและทักษะในการดูแลผู้ป่วยโรคเบาหวานสูงกว่ากลุ่มควบคุม ณ สัปดาห์ที่ 4 และสัปดาห์ที่ 8 หลังการทดลอง

ข้อเสนอแนะจากการวิจัย พบว่า โปรแกรมนี้ช่วยเสริมสร้างสมรรถนะและสร้างความมั่นใจในการดูแลผู้ป่วยโรคเบาหวานของพยาบาลเวชปฏิบัติ ณ หน่วยบริการปฐมภูมิ ด้วยวิธีการจัดอบรมเชิงปฏิบัติการระยะสั้นและใช้สื่อ e -learning ที่เหมาะสมสำหรับการเรียนรู้ด้วยตนเอง และควรมีการนิเทศติดตามการปฏิบัติงานอย่างต่อเนื่องเพื่อช่วยให้พยาบาลเวชปฏิบัติ ปฏิบัติงานได้อย่างมีประสิทธิภาพ

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Outcomes of an Advanced Practice Nurse–Led Continuing Care Program in People with Heart Failure

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Abstract: Heart failure is a serious, chronic, and complex condition requiring continuing care. Therefore, advanced practice nurses play a key role to improve the healthcare quality for this population. The purpose of this quasi-experimental study was to compare outcomes of persons with heart failure receiving the Continuing Care Program led by advanced practice nurses and those receiving usual care. Purposive sampling was used to recruit people with heart failure from a university hospital in Thailand. The participants numbered 29 and 42 in the comparison and intervention groups, respectively. The study outcomes included: body weight changes, complications, functional status, quality of life, satisfaction with nursing care, emergency room visits, time interval between discharge and the first readmission, readmission rate, length of stay, and cost of care assessed at hospital discharge and three-months post-discharge Data were analyzed using descriptive statistics, nonparametric tests, t-test, and regression analysis.

Results revealed that functional status, quality of life, and patient satisfaction with nursing care in the intervention group were significantly higher, whereas length of stay and cost of care were significantly lower than those in the comparison group. Therefore, the Advanced Practice Nurse-Led Continuing Care Program holds promise for improving population-based care outcomes for those with complicated chronic health problems such as heart failure.

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Introduction

Heart failure (HF) is a major public health problem that leads to morbidity, hospitalization, and mortality in adults and older adults.[1] Hospitalization accounts for the majority of the costs in heart failure care.[2] Total medical costs have been projected to increase from $20.9 billion in 2012 to $53.1 billion in 2030.[2] In Thailand, heart failure is one of the major cardiovascular health problems and financial

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burdens.[3] HF is a clinical syndrome where heart is unable to pump sufficient blood to meet the metabolic needs of the body's tissues[3] resulting in clinical symptoms, such as rales, edema, and shortness of breath due to intravascular or interstitial volume overload. Additionally, inadequate tissue perfusion leads to consequent signs of fatigue and poor exercise tolerance.[4] The symptoms of heart failure are often characterized by stages of decline interrupted by the stage of stability,[5] which is difficult to predict and demanding for patients and families to manage because of its complexity. Poor management leads to worsening symptoms, decreased functional status, anxiety and depression, and poor quality of life, and exacerbation leading to more hospital readmission.[6,7,8] Thus, a person with heart failure (PWHF) requires ongoing support in managing the complex interplay between disease severity, treatment strategies and symptom control. There is strong evidence that advanced practice nurses (APNs) can effectively coordinate care with patients and families, physicians, and other health care providers to achieve holistic care and better outcomes.[9]

Evidence of APNs' impact on favorable outcomes has been explored in diverse patients.[10-14] For patients who are chronically ill with a diverse array of health problems, APNs have had a favorable impact through providing continuity of care, and population-based and efficient case management. For PWHF in particular APN care management has reduced unplanned readmissions[14-18] and healthcare costs,[14] and improved time to readmission,[14] self-care scores,[19] and patients' quality of life.[18,19] However, in Thailand, there are few studies about the implementation of continuity of care programs, as well as few studies examining APN outcomes in PWHF. Therefore, the purpose of this study was to compare the outcomes of an Advanced Practice Nurse-Led Continuing Care Program (APN-CCP) in PWHF with those of a comparison group receiving usual care. The outcomes measured included body weight changes, complications, functional status, quality of life, satisfaction with nursing care, emergency room visits, time interval between discharge and the first readmission, readmission rate, length of stay, and cost of care.

Literature Review

The ability of patients with HF to maintain an optimal level of physical and psychological well-being, resulting in reduced morbidity and mortality rate, and lower cost of healthcare services is related to their ability to manage their therapies and symptoms and to work effectively with their health care providers.[20] Effective self-care includes: becoming knowledgeable about the condition, understanding and detecting symptoms in their early stages, taking medications accurately, managing fluid and sodium intake, and balancing physical activity and rest. Also, improving general health behaviors such as stopping smoking and receiving immunizations, managing other comorbidities, and navigating the health care system are critical components of effective self-management.[20] The consequences of poor management or limitations in self-care can lead to poor outcomes. Thus, because of the number of persons affected by HF and the complexity of its management, APN continuity of care management holds strong potential for improving outcomes and health for this critical, and growing population.[21]

The competencies of APNs include activities undertaken as part of delivering advanced nursing care directly to patients. Care management is the core competency that is expected of an APN. An APN has to analyze patients' problems, establish care team and system for monitoring patient care, and manage the nursing care system for a target population. Therefore, APNs' roles suit the performance of care management for PWHF who have complicated problems and need continuity of care. APNs working in population-based care reflect a process of continuity of care because they can follow up their responsible clients across settings, from one unit to another or from hospital to home. In addition, continuity of care through hospitalizations by APNs is usually based on a multidisciplinary collaboration model. The multidisciplinary interventions are those in which management is team based, with a physician plus one or more of the following: a specialist nurse, a pharmacist, a health educator, a dietician, or a social worker.[22] Findings of previous studies show that they can reduce both hospital admission and mortality rate, improve quality of life, and decrease the economic burden in persons with HF.[22,23] Moreover, previous studies[22] demonstrated the effectiveness of multidisciplinary interventions having a nurse assistant in the management of PWHF. A continuing care program is one of the multidisciplinary interventions used by APNs to improve outcomes. In this present study, a continuing care program led by APNs was designed to manage care for PWHF, and established to bridge the gap of caring between the hospital and home.

Outcomes refer to the result of structure and process factors and a measure of healthcare quality.[24] Outcomes of the APN are explained as the end product of an intervention based on the use of clinical judgment and theoretical, scientific knowledge, skills, and experiences and are the natural consequences of the APN's work, goals, and focus.[9] One way of measuring outcomes of APN care are using the values that APNs put on their areas of practice.[25] Measuring outcomes of APN in this study were the end result of the continuing care program on patient and hospital outcomes. Recently, there has been evidence of the effectiveness of APNs' care on outcomes, for example, health status and improved service outcomes in a variety of studies conducted in Thailand.[26] However, outcomes of the APN-led interventions have not been explored clearly in this population in the country.

The Nursing Role Effectiveness Model (NREM),[27] used as the framework for this study, is based on the structure-process-outcome model of Donabedian.[28] The structure component consists of nurse, patient, and organization variables that affect the processes and outcomes of care. Process refers to nursing interventions synthesized from the competencies of the APNs' role including care management to design a continuing care program led by APNs as the intervention for this study and drove the outcomes. The outcomes refer to patient outcomes and hospital outcomes that are expected to be sensitive to the effects of nursing interventions. Therefore, in this study, the NREM[27] in combination with the role competencies of APN and with the care management concept were used as a theoretical framework to explore outcomes of the APN-CCP for PWHF by testing the following hypotheses:

PWHF receiving the intervention will have fewer complications, emergency room visits, hospital readmissions, shorter lengths of stay during readmissions, and lower cost of care, but higher negative body weight balance, functional status, quality of life, satisfaction with nursing care, and time interval between discharge and the first readmission than those in the comparison group.

Methods

Design: This study used a quasi-experimental, pretest and posttest design with a comparison group.

Sample: The sample consisted of 2 groups: PWHF who received the APN-CCP and PWHF receiving usual care. Criteria for inclusion of the participants were being: 45 years old and older; diagnosed with HF from myocardial infarction with ejection fraction (EF) less than 40% or Killip class III-IV; alert and oriented, reachable by telephone after discharge; and able to speak and understand Thai language. The exclusion criteria were: having severe symptoms or complications from heart or comorbid diseases, death after recruitment into the study, referred or moved to another setting, and not available for follow-up at OPD.

Power analysis revealed that 50 participants were needed for each of the intervention and comparison groups to achieve an effect size of 0.50,[14] an alpha of .05, and a power of .80. Study enrollment included 34 comparison and 46 intervention participants. The data collection in the comparison group was conducted first to prevent contamination of the care since the same inpatient units were used for both phases of the study. Following comparison group data collection, enrollment for the intervention phase began. Target enrollment goals were not achieved because approximately 30-40% of PWHF had such severe symptoms or complications from heart problems that they were unable to participate in the study, or were moved to other settings, and therefore were not available for follow-up at home. In addition, five participants of the comparison group and four participants of the intervention group died during the study. Thus, the final total sample consisted of 71 participants: 29 in the comparison group and 42 in the intervention group.

The intervention was provided by two APNs who had graduated with a master's degree in nursing, and were certified as APNs by the Thailand Nursing and Midwifery Council (TNMC); worked full-time as population-based APNs across units; provided special care for a group of PWHF; and were willing to participate in the study. They implemented the intervention as part of their usual care duties.

Setting: This study was conducted at a medical nursing department of a 2000-bed university hospital in northern Thailand. This facility provided both routine and specialized care services to critically and/or chronically ill with a wide range of diseases and conditions that required hospitalization and advanced treatments. Participants were drawn from two coronary care units, one male medical care unit, and one female medical care unit because PWHF were predominantly admitted to these units. Care for PWHF in these units was provided by physician specialists, residents, nurses, and other health care providers who adhered to standard practices of care in the hospital.

Ethical Considerations: This study was approved by the Research Ethics Committee of the Faculty of Medicine, Chiang Mai University (NONE-2557-02387). All potential participants were informed about: the purpose of the study; what participation in the study involved; confidentiality and anonymity issues; and, the right to withdraw without repercussions. All participants were asked to sign a consent form prior to inclusion.

Intervention*: *Advanced Practice Nurse-Led Continuing Care Program (APN-CCP)

The APN-CCP focused on coordinating and facilitating continuous care from hospital to home. Components of the APN-CCP included assessment and problem identification; collaborative care and discharge plan development and implementation; care coordination from hospital to home, and continuous monitoring and evaluation across the follow-up period.[19] During hospitalization, the APNs visited the patients within 24 hours of admission to assess their symptoms and health problems, transition care needs, expectations of the hospital experience and began development of the plan of care. The goals of care were developed in collaboration with the PWHF, caregivers, physicians, nurses, and other healthcare team members. PWHF and caregivers were encouraged to participate in goal setting. Daily visits continued throughout the hospitalization. The focus of these 30-60 minute visits included patient and caregiver education about heart failure, symptoms, treatment and medications, dietary recommendations, symptom reporting and management and activity and exercise progression. APNs began the process of skills training to prepare patients and caregiver for the transition to home. A patient's specific symptoms, treatment plan and individualized self-management plan guided the discussions, with a particular focus on issues that are likely to arise during the early discharge period. The APNs collaborated with the healthcare team by having informal and formal meetings, attending team conferences, attending patient rounds with physicians and/or making phone calls to related healthcare providers. The collaboration with the nurses, physicians, and other healthcare providers was done to design a patient specific plan, coordinate its implementation, support the efforts of nurses and other providers and maintain communication with all team members regarding the patient's progress in meeting discharge goals.

Within 24 hours before discharge, the APNs visited the patient and related healthcare team members to finalize discharge preparations. Specific information related to signs and symptoms of HF, medication, diet, resources in community including the telephone number for counseling, were given to the PWHF and their caregivers. Follow-up appointments for outpatient department (OPD) visits 2 weeks after discharge were made and confirmed with the PWHF. The discharge plan included a map to PWHF's residences, the precise address, and PWHF's telephone numbers.

After discharge, the APNs were available to the PWHF and their caregivers by telephone from 8 a.m. to 8 p.m., Monday through Friday, and 8 a.m. to noon on weekends. The APNs visited each patient at OPD on the day of 2 weeks-follow up where the APN assessed competencies of PWHF and family in self-care having been home for 2 weeks and reinforced information and skills. The caregivers' ability to supplement the PWHF's self-care efforts as well as any concerns about the environment at home were assessed. PWHF were encouraged to maintain their functional ability. Caregivers were also encouraged to ask questions and learn about strategies to support the PWHF. Moreover, social and community resources availability were assessed and assistance for accessing community resources was provided.

Usual care: This consisted of routine care activities provided for PWHF by nurses and physicians following standard of care in place at the agency at the time of the study. Staff nurses provided functional nursing care in the hospital, a method of providing patient care by which nurses perform specific tasks for a large group of patients, and take care of patients at their units only, namely unit-based care. On the day of discharge, they provided discharge planning for PWHF at their units as well. However, their care includes only unit-based activities and excludes care in OPD or telephone follow-up post discharge.

PWHF received HF medical management consistent with current Thai medical practices related to HF treatments. The medical plan of care did not differ between groups, except that physicians responding to the APNs assessment of the intervention patient needs and symptoms.

Instruments: Data were obtained through four questionnaires: *Personal Information Record Form (PIRF)*; *Outcomes Record Form (ORF)*; *Minnesota Living with Heart Failure Questionnaire (MLHF-Q);* and *Satisfaction with Nursing Care Questionnaire (SNCQ).*

The *PIRF*, developed by the primary investigator (PI), was used to obtain the participants' demographic data of age, gender, marital status, religion, comorbidities, heart failure related complications, treatment regimen, history of illness, medications ordered, and laboratory results.

The PI-developed *ORF* for gathering data related to outcomes variables consisted of body weight changes, functional status, complications (i.e., pulmonary edema, renal failure, cardiac arrhythmia, and skin break down), emergency room visits, time interval between discharge and the first readmission, readmission rate, length of stay, and cost of care. Functional status was referred to an individual's ability that carries out activities of daily living and participates in life situations and society. It was measured by the New York Heart Association Classification developed by the Criteria Committee of the New York Heart Association.[29] The PWHF are classified into one to four categories: Class I = no symptoms and no limitation during ordinary physical activity; Class II = mild symptoms and slight limitations during ordinary physical activity; Class III = marked limitation during physical activity; Class IV = unable to carry out any physical activities without discomfort. A lower of the classification indicates greater in functional status. Regarding complications, the number of patients who did or did not develop pulmonary edema, renal failure, cardiac arrhythmia, skin break down, and/or others during the study period only was counted. Resource use included counting per patient emergency room visits, hospital readmissions, and the time interval between discharge and the first readmission, as well as length of stay for subsequent readmissions. Cost of care was defined as the money that PWHF spent for care services related to the investigation and treatments including laboratory tests, procedures, therapies, medications, healthcare service fees, and medical facilities. The data were collected from the database management system of setting.

The *MLHF-Q* developed by Rector et al.,[30] was used to assess the participants' perception of the effects of heart failure on the physical, socioeconomic, and psychological aspects of their lives. The participants responded to 21 items using a six-point Likert scale, ranging from 0 to 5 as follows: 0 = no; 1 = very little; 2 = little; 3 = moderate; 4 = much; and 5 = very much. The possible summary score ranges from 0 to 105; a lower score reflects higher quality of life. It was translated to Thai by two bilingual experts in content accuracy of the Thai version of the MLHF-Q study.[31] Moreover, the psychometric properties of the Thai version of the MLHFQ were tested by Tangsatitkiat and Sakthong.[32] The results showed that Cronbach's alpha were .86 to .93. An item example is "Did your heart failure prevent you from living as you wanted during the past month (4 weeks) by making you short of breath?" In this study, this instrument was tested with 15 PWHF and its Cronbach's alpha coefficient was .84 and in this main study was .81.

The *SNCQ*, a 15-item self-rating questionnaire developed by Suwisith and Hanucharurnkul[33] was used to evaluate patients' satisfaction with nursing care. The participants were asked to rate their satisfaction with care provided by the APN (for the intervention group) or registered nurses (for the comparison group) on a 5-point Likert scale, ranging from 1 to 5 as follows: 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; and 5 = strongly agree. All items were positive questions. The total score was calculated by summing score on each of the 15 items. The total score was 75 points; a higher score indicates higher satisfaction with care. An item example is "The nurse could solve your problems." Reliability analysis was performed on the questionnaire with Cronbach alpha coefficient for pre-test with 15 PWHF being .90 and for this study was .89.

Procedure: Data collection was conducted from September 2014 to May 2016. PWHF were recruited by purposive sampling. The data collection in the comparison group was conducted first to prevent contamination of the care. The PI reviewed patients' medical records to identify those who met the inclusion criteria for the comparison group. Demographic data and history of illness were recorded from the medical records and the interview was conducted at the time of enrollment. Functional status, patient satisfaction, and quality of life were assessed. The comparison group received treatment and usual nursing care as following the standard of care for PWHF and discharge planning by two master-prepared nurses. Within 24 hours before discharge, patient outcomes for posttest Time 2 and hospital outcome (length of stay) were assessed by a research assistant. Then, three months after discharge, all study outcomes of PWHF and emergency room visits, time interval between discharge and the first readmission, readmission rate, and cost of care were assessed.

Once data collection in the comparison group was finished (after posttest Time 2), the intervention group was recruited and that phase of the study began. The APN-CCP intervention group's baseline data were collected within 24 hours of hospitalization and continued as described above. All outcomes of the participants in the intervention and comparison groups were measured on the day of discharge and three months after discharge.

Data Analysis: Descriptive statistics were used to analyze the participants' demographics. Chi-square, Fisher's exact, and t-test were used to compare differences between the intervention and comparison groups. The outcome variables were analyzed using regression analysis with the Stata statistical software.

Results

The participants' ages ranged from 44 to 89 years. The mean age in the intervention group and the comparison group were 66.30 years (SD = 11.18) and 67.65 (SD = 9.93), respectively. Most participants in both groups were male, married, Buddhist, and had ST elevation myocardial infarction. Additionally, they had an ejection fraction lower than 50% and had co-morbidities before admission but had no heart failure related complications. No statistically significant differences were found between the intervention and comparison groups regarding age, gender, marital status, religion, ejection fraction, co-morbidity, and heart failure-related complications.

For testing the difference of outcomes between two groups, Gaussian regression analysis was used to evaluate the effectiveness of intervention to body weight changes and patients' satisfaction with nursing care. There were no statistically significant differences between the two groups in body weight changes on the day of discharge and at 3 months after discharge, whereas the score of patients' satisfaction with nursing care in the intervention group was significantly higher than that in the comparison group at 3 months after discharge (Table 1).

Table 1 Effectiveness of Intervention on Patients' Body Weight Changes and Satisfaction with Nursing

Variables	Coef.	SE	t	95% CI	p-value
Body weight changes					
At discharge					
Intervention group	-0.02	0.79	-0.03	-1.60 to 1.56	.980
Gender*	1.31	0.84	1.57	-0.35 to 2.98	.121
Type of MI*	-3.42	1.20	-2.86	-5.82 to -1.03	.006
Ejection Fraction*	0.02	0.03	0.82	-0.04 to 0.09	.417
Age*	-0.02	0.04	-0.48	-0.10 to 0.06	.630
Constant	-2.28	3.24	-0.70	-8.76 to 4.19	.484
3 months after discharge					
Intervention group	-0.13	0.94	-0.14	-2.01 to 1.75	.891
Gender*	-1.88	0.96	-1.94	-3.81 to 0.05	.056
Type of MI*	-3.24	1.43	-2.27	-6.09 to -0.38	.027
Ejection Fraction*	0.06	0.04	1.57	-0.02 to 0.14	.120
Age*	-0.01	0.05	-0.08	-0.09 to 0.09	.936
Constant	-3.36	3.79	-0.89	-10.92 to 4.22	.379
Patients' satisfaction with nursing care					
At discharge					
Intervention group	3.40	1.84	1.85	-0.27 to 7.06	.069
Satisfaction time 1**	0.55	0.12	4.31	0.30 to 0.81	.000
Gender**	1.70	1.82	0.93	-1.93 to 5.33	.354
Type of MI**	0.04	2.64	0.02	-5.23 to 5.32	.986
Ejection Fraction**	0.02	0.08	0.30	-0.13 to 0.17	.768
Age**	-0.05	0.08	-0.57	-0.22 to 0.12	.567
Constant	31.39	10.74	2.92	9.95 to 52.83	.005
3 months after discharge					
Intervention group	4.56	1.27	3.58	2.01 to 7.09	.001
Satisfaction time 1**	0.28	0.09	2.82	0.08 to 0.47	.006
Gender**	-0.40	1.22	-0.33	-2.83 to 2.02	.743
Type of MI**	-1.80	1.86	-0.97	-5.53 to 1.92	.337
Ejection Fraction**	0.04	0.05	0.72	-0.06 to 0.14	.471
Age**	0.09	0.06	1.52	-0.02 to 0.21	.134
Constant	41.99	8.30	5.06	25.41 to 58.58	.000

* Effectiveness of intervention was adjusted by age, gender, EF, and type of MI.

** Effectiveness of intervention was adjusted by satisfaction Time 1, age, gender, EF, and type of MI.

The results of logistic regression showed that there were no statistically significant differences in complications, emergency room visits, and readmission rate between 2 groups. However, functional status in the intervention group at 3 months after discharge was significantly lower than that in the comparison group, indicating better functional ability (Table 2). Multilevel analysis techniques were used to evaluate the effectiveness of intervention on quality of life (QOL). It was found that QOL in the intervention group was significantly better than that in the comparison group on the day of discharge and at 3 months after discharge (Table 3).

Table 2 Effectiveness of Intervention on Complications, Functional status, Emergency Room Visits, and Readmission Rate

Variables	OR	SE	z	95% CI	p-value
Complications					
At discharge					
Intervention group	0.51	0.22	-1.53	0.21 to 1.21	.127
Age*	0.99	0.02	-0.28	0.94 to 1.04	.782
Gender*	1.17	0.53	0.35	0.48 to 2.85	.727
Ejection Fraction*	1.01	0.02	0.30	0.96 to 1.04	.765
Type of MI*	5.19	3.41	2.50	1.42 to 18.84	.012
Constant	48.34	170.16	1.10	0.04 to 47893.46	.270
3 months after discharge					
Intervention group	0.45	0.21	-1.74	0.18 to 1.11	.081
Age*	0.97	0.02	-1.08	0.93 to 1.02	.281
Gender*	1.46	0.70	0.78	0.56 to 3.74	.433
Ejection Fraction*	1.00	0.02	-0.01	0.96 to 1.04	.996
Type of MI*	2.10	1.44	1.08	0.54 to 8.06	.279
Constant	173.25	630.92	1.42	0.14 to 217982.60	.157
Functional status					
At discharge					
Intervention group	0.54	0.19	-1.74	0.27 to 1.08	.082
Age*	1.00	0.02	0.05	0.96 to 1.04	.957
Gender*	1.68	0.61	1.42	0.82 to 3.43	.155
Ejection Fraction*	1.02	0.02	1.47	0.99 to 1.05	.141
Type of MI*	1.66	0.84	0.99	0.61 to 4.47	.320
3 months after discharge					
Intervention group	0.36	0.14	-2.68	0.17 to 0.76	.007
Age*	1.01	0.02	0.42	0.97 to 1.04	.673
Gender*	2.08	0.80	1.92	0.98 to 4.42	.055
Ejection Fraction*	1.01	0.02	0.70	0.98 to 1.04	.486
Type of MI*	0.19	0.64	0.37	0.42 to 3.46	.709
Emergency room visits					
Intervention group	0.29	0.20	-1.78	0.08 to 1.13	.075
Age*	0.96	0.03	-1.29	0.90 to 1.02	.196
Gender*	2.52	1.86	1.25	0.60 to 10.72	.212
Ejection Fraction*	0.90	0.03	-2.77	0.84 to 0.96	.006
Type of MI*	1.78	1.75	0.59	0.26 to 12.26	.558
Constant	296.98	863.02	1.96	0.99 to 88357.14	.050

Table 2 Effectiveness of Intervention on Complications, Functional status, Emergency Room Visits, and Readmission Rate (Cont.)

Variables	OR	SE	z	95% CI	p-value
Readmission rate					
Intervention group	0.21	0.16	-1.95	0.04 to 1.01	.051
Age*	0.95	0.03	-1.32	0.88 to 1.02	.188
Gender*	2.22	1.88	0.94	0.42 to 11.66	.345
Ejection Fraction*	0.92	0.04	-2.09	0.85 to 0.99	.036
Type of MI*	1.37	1.72	0.25	0.12 to 16.02	.800
Constant	144.22	453.41	1.58	0.30 to 68387.25	.114

* Effectiveness of intervention was adjusted by age, gender, EF, and type of MI.

Table 3 Effectiveness of Intervention on Quality of Life

Quality of life	Coef.	SE	Z	95% CI	p-value
At discharge					
Intervention group	-6.38	2.87	-2.22	-12.00 to -0.74	.026
Gender*	6.09	3.03	2.01	0.15 to 12.03	.044
Type of MI*	6.66	4.31	1.54	-1.80 to 15.11	.123
Ejection Fraction*	-0.16	0.12	-1.32	-0.40 to 0.08	.186
Age*	-0.02	0.14	-0.16	-0.31 to 0.26	.870
Constant	41.44	11.61	3.57	18.69 to 64.18	.000
3 months after discharge					
Intervention group	-8.94	2.81	-3.18	-14.45 to -3.43	.001
Gender*	8.36	2.92	2.86	2.62 to 14.10	.004
Type of MI*	7.20	4.24	1.70	-1.11 to 15.50	.089
Ejection Fraction*	-0.26	0.12	-2.24	-0.50 to -0.03	.025
Age*	-0.05	0.14	-0.37	-0.33 to 0.22	.711
Constant	45.12	11.28	4.00	23.00 to 67.24	.000

* Effectiveness of intervention was adjusted by age, gender, EF, and type of MI.

The effectiveness of the intervention on the time interval between discharge and the first readmission, length of stay, and cost of care was evaluated by Poisson regression. The result showed that the length of stay, and cost of care in the intervention group were significantly lower than those in the comparison group. However, the time interval between discharge and the first readmission of both groups were non-significantly different between 2 groups (Table 4).

Table 4 Effectiveness of Intervention to Time Interval between Discharge and the First Readmission, Length of Stay and Cost of Care

Variables	Coef.	SE	Z	95% CI	p-value
Time interval between discharge and the first readmission					
Intervention group	2.17	3.22	0.67	-4.16 to 8.50	.502
Age*	0.92	0.13	6.89	0.66 to 1.18	.000

Table 4 Effectiveness of Intervention to Time Interval between Discharge and the First Readmission, Length of Stay and Cost of Care (Cont.)

Variables	Coef.	SE	Z	95% CI	p-value
Gender*	-15.12	3.66	-4.13	-22.29 to -7.95	.000
Ejection Fraction*	-0.08	0.14	-0.55	-0.36 to 0.21	.584
Type of MI*	40.90	10.02	4.08	21.26 to 60.54	.000
Constant	-17.68	10.84	-1.63	-38.95 to 3.58	.103
Length of stay					
Intervention group	-2.20	0.66	-3.34	-3.49 to -0.91	.001
Age*	0.11	0.03	3.35	0.04 to 0.18	.001
Gender*	-1.99	0.68	-2.93	-3.32 to -0.66	.003
Ejection Fraction*	-0.06	0.03	-2.50	-0.11 to -0.01	.012
Type of MI*	5.26	1.24	4.21	2.80 to 7.70	.000
Constant	5.25	2.48	2.11	0.38 to 10.13	.035
Cost of care					
Intervention group	-24608.32	105.84	-232.50	-24815.77 to -24400.87	.000
Age*	-364.48	5.71	-63.77	-375.68 to -353.28	.000
Gender*	-47926.83	114.42	-418.83	-48151.11 to -47702.56	.000
Ejection Fraction*	-1123.13	4.23	-265.32	-1131.43 to -1114.84	.000
Type of MI*	28916.70	161.12	179.47	28600.91 to 29232.50	.000
Constant	320325.40	433.46	738.98	319475.90 to 321175.00	.000

* Effectiveness of intervention was adjusted by age, gender, EF, and type of MI.

Discussion

Results provided support for the effectiveness of the APN-CCP for PWHF. Statistically significant differences in functional status, patients' satisfaction with nursing care, QOL, length of stay, and cost of care were found between the patients who received the APN-CCP compared with those receiving usual care. This indicates that APN competencies related to improving patients' ability to manage complexity may have had a positive effect. However, no significant differences of body weight changes, complications, emergency room visits, readmission rate, and time interval between discharge and the first readmission were found between two groups.

The results of positive outcomes might be explained that, according to the APN-CCP protocol, APN care focused on comprehensive assessment, team collaboration and care plan development, patient and family education and skill building during inpatient visit. Thus, the APN was able to assess patients' anxiety related to self-care and their health status and provide support and specific strategies to manage their care more effectively. Building a relationship during the most intense inpatient phase may have enabled patients and families to trust the APN and be more likely to reach out by telephone after discharge. During the OPD visit two weeks after discharge, APNs assessed competencies of the participants in self-care at home and strengthened their knowledge and skills at a time when they had had some experiences with implementing the post discharge plan. As a result, positive findings may be related to a combination of knowledge gained plus reassurance and confidence building for the intervention group. It is possible that this support increased patients' competence and confidence in engaging in physical activities/exercise that led to improved functional ability. This is consistent with a previous study[34] which revealed that continuing care interventions involved by multi-disciplined professionals or professional nurses included education, instruction, counseling, and telephone contact could improve patients' activities.

Potentially related to the APN-CCP's success in improving functional status may be the finding that QOL improved as well. It could be explained that this program consisting of continuing education, reviewing of knowledge and skills, and reinforcing patient education from inpatient to outpatient could improve knowledge symptom detection, symptom management skills and thereby facilitating control of heart failure symptoms. The participants in the intervention group reported lower heart failure symptom severity associated with effective self-care and resumption of exercise. This finding was consistent with that of Koukoui and colleagues[35] who noted that the impact of physical exercise on improved functional ability and QOL over 6 months of measurement. Hence the combination of improved exercise capacity, functional status, and symptom management contributed to an overall improvement in QOL compared to what was experienced by PWHF receiving usual care.

Regarding the hospital outcomes, the length of stay and cost of care in the intervention group were lower than those in the comparison group. This may be related to the role that the APNs played in detecting early signs of problems, and collaboratively, with physicians, implementing strategies to prevent the onset of symptoms or to minimize their effects during the inpatient phase. During the intense inpatient phase, APNs' regular assessment of participants' health status, laboratory results, persistent or emerging symptoms coupled with prompt consultation with cardiologists and other physicians may have resulted in more timely detection and management as well as prevention of symptoms and complications. They formed constructive relationships with the staff nurses who provided 24 hour care, educated them, and guided them in specific patient focused nursing care, possibly preventing adverse events such as late detection of symptoms. This improved vigilance could have supported overall achievement of the plan of care and contributed to shorter hospital stays. The shorter length of stay in the intervention group was likely responsible for the decreased cost of care. This result is consistent with a study of Rauh and colleagues[36] which presented that the program implemented by a multidisciplinary team consisting of a cardiologist director, a clinical nurse specialist, registered nurses, and a patient care technician could reduce length of stay and cost of care. Similarly, Naylor and colleagues[14] found that a comprehensive transitional care intervention for PWHF could decrease healthcare cost.

Stronger patient satisfaction scores in the intervention group may be related to two factors noted in the patient interviews: APNs' response to their needs, and APNs as consultants for problem solving. Patients reported that the APNs were expert in teaching, coaching, and problem solving, thus empowering patients to learn self-care skills and to build their confidence in taking care of themselves. This finding is similar to a previous study reporting that continuity of care the providing information about patients' conditions, medications, activities, and available community services coupled with promotion of patient self-care, and feelings of confident preparedness to manage care after hospitalization, were significantly correlated to higher satisfaction with care by the patients.[37]

Some study measures failed to identify significant differences between the groups. The lack of APN-CCP effect on body weight changes, complications, emergency room visits, readmission rate, and time interval between discharge and the first readmission between the intervention group and comparison group may be related to how well the intervention could target the complexity of these specific patients' needs. There are three possible reasons for the lack of significant findings. Firstly, all participants were recruited from the CCU following an acute myocardial infarction with HF as a complication. Therefore, participants in this sample represented a more acutely ill patient population than was seen in other similar APN care coordination studies.[14,38] Had a broader spectrum of PWHF been included in the sample, such as those admitted to general care units for an exacerbation of chronic heart failure due to multiple causes, their acuity levels may have been more varied.

Secondly, body weight change may not have been a universally important indicator of HF improvement. Depending on the type of HF, for example predominantly pulmonary congestion in acute HF with less total body fluid overload, fluid redistribution rather than by fluid accumulation may be the dominant factor.[39] Measures of symptom severity that are more sensitive to the range of HF symptoms may have shown differences.

Also, participants in the comparison and interventions groups received standard treatment and nursing care of following a care map for heart failure, indicating that all patients received comparable medical and general nursing care, possibly explaining the lack of group differences in complication rates. Lack of difference in acute care resource use (emergency department visits, rehospitalization timing and rates) may be related to the "dose" or intensity of the APN intervention. The APN-CCP focused on preparing patients for self-management but did not include home visits. Other studies revealed that an APN intervention for complex PWHF that involved hospital care coupled with an average of 2 months of home visit follow up was effective in both preventing readmissions and delaying the time to readmission as well as decreasing overall healthcare costs in the intervention group.[15,36] Naylor and colleagues found that the Transitional Care Model (TCM), a program similar to the current study (intense hospital phase) but including one month of APN home visits in addition to telephone availability, resulted in delayed and decreased rehospitalization and cost savings for a variety of high risk elders but was not as effective for PWHF.[40] When the program was modified to extend the intervention up to 2 months on average (1-3 months) with more focused attention to HF management specifically, reduction in acute usage and some functional outcomes.[14] It is possible that for these highly complex persons with HF, the "dose" of APN care should include direct care in the home to detect and manage worsening symptoms, prepare patients and families to manage the high levels of complexity, and develop sustained self-management skills. Similar to the current study, the TCM included APN OPD visits but ensured that the patient, physician and APN discussed the patient's progress, goals and problems together during that visit. This continued APN-physician collaboration with strong focus on patient goals seemed to be a key factor in preventing acute care usage, for example, prompt revision of the treatment plan based on the APN's assessment of symptoms and problems encountered post-discharge. Therefore, the effectiveness of the APN in connecting patients to community resources and actually managing their care in the home could not be shown clearly in this study.

In conclusion, the findings suggest partial effectiveness of the APN-CCP for PWHF. Processes of care contributing to the favorable outcomes were conceptualized from the Nursing Role Effectiveness Model of Irvine and colleagues[27] in combination with the role competencies of APN including holistic and continuity of care. Moreover, APNs in this study worked full time, functioning in advanced practice nursing in population-based care. This could be a significant reason to explain favorable outcomes.

Limitations

Firstly, the intervention was conducted at only one university hospital in northern Thailand, which may not be representative of PWHF in other settings. Another limitation may be that the actual sample size was less than the purposed and had high attrition, mainly due to mortality. Recruiting patients with a wider range of HF severity, from general care units as well as CCUs, would improve both the generalizability of findings as well as supported achievement of the targeted sample size, affecting the study's power to find significance.

Conclusions and Recommendations

The results in this study point out that APNs using the Nursing Role Effectiveness Model[26] and working as the population-based care can contribute to the improved outcomes of patients in the intervention group. Therefore, future research is needed to determine how the competencies of APN care can be leveraged to enhance patient outcomes in diverse settings and care environments. It is also recommended that the APN-CCP include home visit after discharge, which incorporates various roles of APNs, care service networks, and care management to demonstrate the effectiveness of the program on outcomes more clearly.

References

1. Roger VL. Epidemiology of heart failure. Circ Res. 2013; 113(6): 646-59.
2. Heidenreich PA, Albert NM, Allen LA, Bluemke DA, Butler J, Fonarow GC, et al. Forecasting the impact of heart failure in the United States: a policy statement from the American Heart Association. Circ Heart Fail. 2013; 6(3): 606-19.
3. Laothavorn P, Hengrussamee K, Kanjanavanit R, Moleerergpoom W, Laorakpongse D, Pachirat O, et al. Thai acute decompensated heart failure registry. CVD Prev Control. 2010; 5: 89-95.
4. Piepoli MF, Guazzi M, Boriani G, Cicoira M, Corrà U, Dalla Libera L, et al. Exercise intolerance in chronic heart failure: mechanisms and therapies. Part I. Eur J Cardiovasc Prev Rehabil. 2010; 17(6): 637-42.
5. Stanley M, Prasun M. Heart failure in older adults: keys to successful management. AACN Clin Issues. 2002; 13(1): 94-102.
6. Hodges P. Factors impacting readmissions of older patients with heart failure. Crit Care Nurs Q. 2009; 32(1): 33-43.
7. Levenson JW, McCarthy EP, Lynn J, Davis RB, Phillips RS. The last six months of life for patients with congestive heart failure. J Am Geriatr Soc. 2000; 48(5 Suppl): S101-9.
8. Zambroski CH, Moser DK, Bhat G, Ziegler C. Impact of symptom prevalence and symptom burden on quality of life in patients with heart failure. Eur J Cardiovasc Nurs. 2005; 4(3): 198-206.
9. McCormick SA. Advanced practice nursing for congestive heart failure. Crit Care Nurs Q. 1999; 21(4): 1-8.
10. Swan M, Ferguson S, Chang A, Larson E, Smaldone A. Quality of primary care by advanced practice nurses: a systematic review. Int J Qual Health Care. 2015; 27(5): 396-404.
11. Aaron EM, Andrews CS. Integration of advanced practice providers into Israeli healthcare system. Isr J Health Policy Res. 2016; 22(5): 7.
12. Parker J M, Hill MN. A review of advanced practice nursing in the United States, Canada, Australia and Hong Kong special administrative region (SAR), China. Int J Nurs Sci. 2017; 4, 196-204.
13. Fougere B, et.al. Development and implementation of the advanced practice nurse worldwide with an interest in geriatric care. J Am Med Dir Assoc. 2016; 17(9), 782-88.
14. Naylor MD, Brooten DA, Campbell RL, Maislin G, McCauley KM, Schwartz JS. Transitional care of older adults hospitalized with heart failure: a randomized controlled trial. J Am Geriatr Soc. 2004; 52(5): 675-84.
15. Kwok T, Lee J, Woo J, Lee DT, Griffith S. A randomized controlled trial of a community nurse-supported hospital discharge programme in older patients with chronic heart failure. J Clin Nurs. 2008; 17 (1): 109-17.
16. Thompson DR, Roebuck A, Stewart S. Effects of a nurse-led, clinic and home-based intervention on recurrent hospital use in chronic heart failure. Eur J Heart Fail. 2005; 7(3): 377-84.
17. Kim SM, Han HR. Evidence-based strategies to reduce readmission in patients with heart failure. J Nurse Pract. 2013; 9(4): 224-32.
18. Whitaker-Brown CD, Woods SJ, Cornelius JB, Southard E, Gulati SK. Improving quality of life and decreasing readmissions in heart failure patients in a multidisciplinary transition-to-care clinic. Heart Lung. 2017; 46(2):79-84.
19. Sezgin D, Mert H, Özpelit E, Akdeniz B. The effect on patient outcomes of a nursing care and follow-up program for patients with heart failure: a randomized controlled trial. Int J Nurs Stud. 2017; 70: 17-26.
20. Moser DK, Dickson V, Jaarsma T, Lee C, Stromberg A, Riegel B. Role of self-care in the patient with heart failure. Current Cardiology Reports. 2012; 14(3): 265-75.

21. Osevala ML. Advance-practice nursing in heart-failure management: an integrative review. J Cardiovasc Manag. 2005; 16(3): 19-23.
22. Holland R, Battersby J, Harvey I, Lenaghan E, Smith J, Hay L. Systematic review of multidisciplinary interventions in heart failure. Heart. 2005; 91: 899-906.
23. Case R, Haynes D, Holaday B, Parker VG. Evidence-based nursing: The role of the advanced practice registered nurse in the management of heart failure patients in the outpatient setting. Dimens Crit Care Nurs. 2010; 29(2): 57-62.
24. Byers JF, Brunell ML. Demonstrating the value of the advanced practice nurse: an evaluation model. AACN Clin Issues. 1998; 9(2): 296-305.
25. Ingersoll GL, McIntosh E, Williamsl M. Nurse-sensitive outcomes of advanced practice. J Adv Nurs. 2000; 32(5): 1272-81.
26. Brooten D, Gordon Y. Editorial: documenting and communicating advanced practice nurses' effectiveness. Pacific Rim Int J Nurs Res. 2018; 22(1): 1-5.
27. Irvine D, Sidani S, Hall LM. Linking outcomes to nurses' roles in health care. Nurs Econ. 1998; 16(2): 58-64, 87.
28. Donabedian A. Exploration in quality assessment and monitoring: the definition of quality and approaches to its assessment. Ann Arbor, MI: Health Administration Press; 1980.
29. The Criteria Committee of the New York Association. Functional capacity and objective assessment. In: Dolgin M, editor. Nomenclature and criteria for diagnosis of diseases of the heart and great vessels 9th ed. Boston: Little, Brown and Company; 1994. p. 253-55.
30. Rector T, Kubo S, Cohn J. Patient's self-assessment of their congestive heart failure. Part 2: content, reliability and validity of a new measure, The Minnesota Living with Heart Failure Questionnaire. Heart Failure. 1987; 1: 198-219.
31. Tangsatitkiat W, Sakthong P. The content improvements of the Thai version of the Minnesota Living with Heart Failure Questionnaire Using Cognitive Interview. Thai Pharm Health Sci J. 2009; 4(2): 227-35. [in Thai]
32. Tangsatitkiat W, Sakthong P. Thai version of the Minnesota Living with Heart Failure Questionnaire: psychometric testing using a longitudinal design. Asian Biomedicine. 2010; 4(6): 877-84.
33. Suwisith N, Hanucharurnkul S. Development of the Patient Satisfaction with Nursing Care Questionnaire. Rama Nurs J. 2011; 17(2): 264-77. [in Thai]
34. Wang S, Zhao Y, Zang X. Continuing care for older patients during the transitional period. Chin Nurs Res. 2014; 1: 5-13.
35. Koukoui F, Desmoulin F, Lairy G, Bleinc D, Boursiquot L, Galinier M, et al. Benefits of cardiac rehabilitation in heart failure patients according to etiology. Medicine (Baltimore). 2015; 94(7): e544.
36. Rauh RA, Schwabauer NJ, Enger EL, Moran JF. A community hospital-based congestive heart failure program: impact on length of stay, admission and readmission rates, and cost. Am J Manag Care. 1999; 5(1): 37-43.
37. Bull MJ, Hansen HE, Gross CR. Predictors of elders and family caregiver satisfaction with discharge planning. J Cardiovasc Nurs. 2000; 14(3): 76-87.
38. McDonald K, Ledwidge M, Cahill J, Quigley P, Maurer B, Travers B, et al. Heart failure management: multidisciplinary care has intrinsic benefit above the optimization of medical care. J Card Fail. 2002; 8(3): 142-8.
39. Arrigo M, Parissis JT, Akiyama E, Mebazaa A. Understanding acute heart failure: pathophysiology and diagnosis. Eur Heart J Suppl. 2016; 18: G11-18.
40. Naylor MD, Brooten D, Campbell R, Jacobsen BS, Mezey MD, Pauly MV, et al. Comprehensive discharge planning and home follow-up hospitalized elders: a randomized clinical trial. JAMA. 1999; 281: 613-20.

ผลลัพธ์ของโปรแกรมการดูแลอย่างต่อเนื่องโดยพยาบาลผู้ปฏิบัติการพยาบาลขั้นสูงในผู้ป่วยภาวะหัวใจล้มเหลว

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บทคัดย่อ: ภาวะหัวใจล้มเหลวเป็นภาวะการเจ็บป่วยที่รุนแรง เรื้อรังและมีความซับซ้อนซึ่งต้องการการดูแลอย่างต่อเนื่อง พยาบาลผู้ปฏิบัติการพยาบาลขั้นสูงมีบทบาทสำคัญในการพัฒนาคุณภาพการดูแลผู้ป่วยกลุ่มนี้ การศึกษากึ่งทดลองนี้มีวัตถุประสงค์เพื่อเปรียบเทียบผลลัพธ์ระหว่างผู้ป่วยภาวะหัวใจล้มเหลวที่ได้รับโปรแกรมการดูแลอย่างต่อเนื่องโดยพยาบาลผู้ปฏิบัติการพยาบาลขั้นสูง และผู้ป่วยภาวะหัวใจล้มเหลวที่ได้รับการพยาบาลตามปกติ กลุ่มตัวอย่างเป็นผู้ป่วยภาวะหัวใจล้มเหลวที่เข้ารับการรักษา ณ โรงพยาบาลมหาวิทยาลัยแห่งหนึ่งของประเทศไทย ถูกคัดเลือกแบบเฉพาะเจาะจง โดยแบ่งเป็นกลุ่มเปรียบเทียบ 29 คนและกลุ่มที่ได้รับโปรแกรมการดูแลอย่างต่อเนื่องจำนวน 42 คนตามลำดับ ผลลัพธ์ที่ศึกษาได้แก่ การเปลี่ยนแปลงของน้ำหนักตัว ภาวะแทรกซ้อน ความสามารถในการทำหน้าที่ คุณภาพชีวิตและความพึงพอใจต่อการพยาบาล การใช้บริการที่ห้องฉุกเฉินหลังจำหน่าย การกลับเข้าพักรักษาซ้ำในโรงพยาบาลภายใน 28 วันหลังจำหน่าย ระยะเวลาหลังจำหน่ายจนถึงวันที่มีการกลับเข้าพักรักษาซ้ำในโรงพยาบาล จำนวนวันนอนโรงพยาบาล และค่าใช้จ่ายในการรักษาพยาบาล ซึ่งจะทำการประเมินผลลัพธ์ ณ วันจำหน่าย และสามเดือนหลังจำหน่าย วิเคราะห์ข้อมูลด้วยสถิติเชิงพรรณนา การทดสอบแบบนอนพาราเมตริก การทดสอบที สถิติการวิเคราะห์ถดถอย (regression analysis)

ผลการศึกษาพบว่าความสามารถในการทำหน้าที่ คุณภาพชีวิต และความพึงพอใจต่อการพยาบาลของผู้ป่วยที่ได้รับโปรแกรมการดูแลอย่างต่อเนื่องสูงกว่าผู้ป่วยที่ได้รับการพยาบาลตามปกติอย่างมีนัยสำคัญทางสถิติ ในขณะที่จำนวนวันนอนโรงพยาบาล และค่าใช้จ่ายในการรักษาพยาบาลของผู้ป่วยได้รับโปรแกรมการดูแลอย่างต่อเนื่องต่ำกว่าผู้ป่วยที่ได้รับการพยาบาลตามปกติอย่างมีนัยสำคัญทางสถิติ ดังนั้น การศึกษานี้ชี้ให้เห็นว่าโปรแกรมการดูแลอย่างต่อเนื่องโดยพยาบาลผู้ปฏิบัติการพยาบาลขั้นสูงที่มีลักษณะการทำงานที่ยึดกลุ่มประชากรเป้าหมายเป็นหลักสามารถทำให้เกิดผลลัพธ์ที่พึงประสงค์สำหรับผู้ที่มีภาวะโรคเรื้อรังซับซ้อนดังเช่นภาวะหัวใจล้มเหลวนี้ได้

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คำสำคัญ: พยาบาลผู้ปฏิบัติการพยาบาลขั้นสูง การดูแลอย่างต่อเนื่อง ภาวะหัวใจล้มเหลว ผลลัพธ์

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Perceptions of Adolescents, Teachers and Parents towards Causes and Prevention of Suicide in Secondary School Students in Chiang Mai

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Abstract: Adolescent suicide has become a major public health concern worldwide, including in Thailand. This qualitative descriptive study explored the perceptions of adolescents, teachers and parents towards causes and prevention of suicide in secondary school students in Chiang Mai. Purposive sampling was used to select 40 adolescents for focus group discussions, and in-depth interviews were conducted with 4 parents and 3 school teachers, from October 2014 to February 2015. The data were analyzed using content analysis.

The categories of this study were two-fold: 1) *the causes of adolescent suicide* which could be summarized into four sub-categories, namely parents' expectations, lack of skills to confront problems, feeling lonely from inadequate support, and lack of parental skills, and 2) *Prevention of adolescent suicide*, which had four sub-categories, namely cultivating self-esteem, parental support and caring, peer support, and supportive school environments. The findings of this study could help as evidence for developing a suicide prevention program for Thai secondary school students and should help parents, teachers and school nurses to understand the emotional needs of adolescents better.

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Introduction

Adolescent suicide is a significant public health problem worldwide[1] and suicide is the third leading cause of death among adolescents aged 15 - 19 years old.[2] In the United States, the Youth Risk Behaviors Surveillance Survey [YRBSS] showed that nearly 18% of high school students had seriously considered suicide within 12 months prior to the 2015 survey.[3] In Thailand, adolescent suicide is the fourth highest cause of death among Thai adolescents.[4] In recent years, evidence indicates that 20.6% of the adolescents in central Thailand aged 12-19 years had suicidal ideation.[5] A situational analysis of adolescent suicide in a district in Chiang Mai, Thailand found that the adolescent suicide attempted and completed rate was

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equal to 13.3 per 100,000 population and the adolescent suicide rate was higher than Thai national rate and the average rate of 5.96 and 6.3 per 100,000 population respectively.[6] The significant burden related to suicide such as emotional and psychosocial morbidity, medical care, lost productivity and secondary distress caused to family members and friends is evident from the fiscal and societal cost associated with adolescent suicidal behavior.[7,8] Thai secondary school students today are facing increasing amounts of school work and are worried about their future field of study as well as their pending future career.[9] In particular, students who aim to study in a university must pass rigorous entrance examinations which include two decisive tests: O-NET (Ordinary National Educational Test) and A-NET.[10] Adolescents who fail to cope well with their growth development may have intense emotional and behavioral problems.[11] To understand this phenomenon and develop an effective suicide prevention program, it is necessary for the researchers. However, little research has explored the perception of suicide among adolescents, teachers and parents towards causes and prevention of suicide in secondary school students in Chiang Mai, Thailand by employing a qualitative study.

Review of Literature

Since 2005 until 2017, there has been an investigation of the prevalence rates of suicidal behaviors among Thai adolescents. Existing research in 2005 indicated that 11.9% of students in grade 10-12 reported having suicidal ideation.[12] In 2007, research showed that 11.4% of students in grade 7-12 seriously considered attempting suicide, 11.5% had made a plan to attempt suicide and 9.3% had attempted suicide.[13] Furthermore, in 2012 it was found that the overall prevalence of suicidal ideation in the past 12 months among school-going adolescents was 8.8% (9.9% males and 7.7% females, N= 2,758).[14]

Previous studies in Western countries and Thailand reported that factors related to suicide risk behaviors among adolescents could be categorized into risk and protective factors. Risk factors related to adolescent suicide have been identified by several studies, including perceived negative life events[11,12,15], rumination[11], and emotional distress[11,16] (depression, hopelessness, and anxiety) that have been emphasized as predictors of suicide risk behaviors. Even though negative life events, rumination and emotional distress are associated with increased risk for suicide, other variables such as resilience[11,15,17], family support[18,19,20,21], and social support[11,22,23,24] serve as protective factors by mediating the risk factors of emotional distress, rumination, and negative life events on suicidal risk behaviors.

Within the past decade, a great deal of suicide prevention literature review has been conducted in order to investigate the types of prevention activities being implemented, the effectiveness of prevention activities and program, and the methodological rigor of prevention research and program evaluation.[25] Suicide prevention strategies can be categorized into three levels, including universal strategies, selective strategies, and indicative strategies.[25] Universal strategies that target the entire population and are designed to enhance protective factors or reduce risk factors across the whole population include suicide education[26] and suicide awareness[26], and skill building.[27] Selective strategies that target the sub-population of adolescents who may be at higher risk for engaging in suicidal behavior include screening techniques[28], gatekeeper training [28] and peer support programs.[29] Indicative strategies, on the other hand, target adolescents who have already exhibited suicidal thoughts and behaviors and aim to minimize the consequences of an adverse event or situation. For adolescent suicide, these strategies aim to provide resources to adolescents that have moved beyond being at risk and are struggling with suicidal ideations and suicide attempts. Two current programs that have been rigorously tested and show promising results are Counselors Care (C-Care)/ Coping and Support Training (CAST)[30] and the IPT-A-IN program.[31] Although many research prevention studies claimed to have obtained positive results, unfortunately, the methodological rigor of the studies has generally been weak. Another problem with current prevention and intervention programs is the lack of a theoretical framework to guide implementation and measurement of effectiveness of such programs.[32]

In contrast, in Thailand, previous studies focused on reducing depressive symptoms among Thai adolescents[33,34] However, there are still some limitations of these existing programs. First, the intervention programs for reducing depressive symptoms did not explain strategies for preventing suicidal risk behavior among Thai adolescents. Second, the intervention programs were primarily developed and delivered by researchers. Finally, Thai adolescent suicide prevention may require comprehensive collaboration among professionals, parents, school teachers, and peers in prevention effort. Although there are a number of existing suicides prevention programs in Western countries, the issues and needs related to a secondary school student suicide in Northern Thai school context need to be identified. Therefore this study aimed to explore the perception of suicide among adolescents, teachers and parents towards causes and prevention of suicide in secondary school students in Chiang Mai, Thailand.

Study design: A qualitative descriptive study[35] was used. This approach helped the researcher to understand the perception of the participants.

Study setting and participants: This study was conducted at a public school in an urban area in Chiang Mai Province, Thailand. This site was selected based on the school director's willingness to participate in the study and the capacity of the school to try to prevent adolescent suicide.

Purposive sampling was used to select the participants who were divided into 3 groups. The first group of 40 adolescents included 20 male students and 20 female students who were studying in Grades 10-12 and they volunteered to participate and undertook in focus group discussions (FGDs). The second group, four female parents of students who were willing to participate and undertook in-depth interview. The third group, three female school teachers who had experience with issues related to adolescent's suicide risk behavior or work related to adolescents' health and were willing to participate and undertook in-depth interview in the study.

Ethical Considerations

This study was approved by the Ethics Review Board of the Faculty of Nursing, Chiang Mai University (Approval number Full-007-2014) and the director of a public school used as study site. All potential participants were informed verbally and in writing of the purpose of the study, methods, potential risks and benefits of participation, and duration of the study. All potential participants were also informed that their participation was voluntary and they had the right to refuse or withdraw from the study at any time without impact on them. Written informed consent was obtained after the participants agreed to participate in the study and assent was gained from the students. Participants' confidentiality and anonymity were guaranteed throughout the research.

Data Collection

Data were collected through FGDs and in-depth interviews, from October 2014 to February 2015. FGDs consisted of ten adolescents per group and each group had a moderator and a note-taker to facilitate the discussion and manage the group. These activities allowed them to participate actively and respond verbally in the topics related to the study in small groups, play games and give awards, and take part in group opinion presentation and discussion. The researcher used open-ended questions to encourage adolescents to think and share their ideas and experiences on suicide risk behaviors and adolescent suicide prevention. The researcher took a role as a modulator and was responsible for note-taking. The FGDs lasted for 60 minutes. Three main questions were "What do you think about adolescent suicide?", "What are the factors related to adolescent suicide?", and "Who should be involved in adolescent suicide prevention in schools, and why?"

In-depth interviews were conducted with three school teachers and four parents. The school teachers who took their role as facilitators arranged the time and place for in-depth interviews. The room for the in-depth interview offered privacy and space for relaxation. The sessions were conducted on the day that school teachers had no teaching and also when school teachers and parents were available to participate. The researcher explained the background and the objectives of the study to the participants and shared more details regarding risk and protective factors related to adolescent suicide risk behaviors, and essential elements of a suicide prevention program. The interviews lasted for approximately 60 minutes. They were audio-recorded, transcribed verbatim and checked for accuracy by four co-researchers.

Four in-depth interview questions for school teachers were "What are the risk and protective factors related to adolescent suicide?", "How can adolescent suicide risk behaviors be prevented?", "What are the critical element(s) of adolescent suicide prevention program?", and "What are your role(s) in adolescent suicide prevention?" Three in-depth interview questions for parents were "What are the risk and protective factors related to adolescent suicide?", "How can adolescent suicide risk behaviors be prevented?", and "What are your roles in adolescent suicide prevention?"

Data analysis

Qualitative data were analyzed iteratively using content analysis.[36] Transcripts from each group were read and categories were reviewed several times in order to ensure that the concepts pertaining to the same phenomena were placed in an appropriate category. The categories and the content of the data throughout the data collection and analysis processes were identified by the primary author and subsequently verified by four co-authors for coding consistency, emergence of categories, and extraction of statements to support each category and sub-category. Coding, categories, and key findings were discussed by the co-authors until consensus was reached.

Rigor and trustworthiness

The researchers used four criteria of Lincoln and Guba to establish the trustworthiness of the study.[37] The credibility was established by using triangulation and member checking, while the transferability was achieved through thick description. To achieve the dependability, filed notes were made throughout the study and the dissertation advisory committee provided their expertise as auditors. Confirmability of the analysis was established by using an analysis audit trail and method triangulation that included in-depth interviews and focus group discussion.

Findings

There were two main categories: 1) *causes of adolescent suicide*, and 2) *prevention of adolescent suicide.*

Category: Causes of adolescent suicide: From adolescents, parents, and school teachers' perspectives, the causes of adolescent suicide could be summarized into four sub-categories: 1) parents' expectations, 2) lack of skills to confront problems, 3) feeling lonely from inadequate support, and 4) lack of parental skills.

Sub-category: Parents' expectations: Most informants perceived that school achievement expectation by parents was a leading cause of adolescent suicide. Parents expected that the children had to study and do what was beyond their ability to achieve. Most adolescent informants perceived that being pressured by parents to pursue the study area that adolescents could not achieve and do what their parents wanted them to do was a common cause of emotional distress and suicide among adolescents. It seemed that adolescents were forced to study hard. Parents also mentioned that children were too young, still studying and having no job. Some parents disagreed with them about having a boyfriend or girlfriend.

> *Parents expect the children to study...want them to become doctors, nurses, and teachers. Their test result marks shouldn't be less than 3, but need to be 3.5 or higher. The children are forced to study hard. ... My children are still studying and have no job ... they are young ... they have to study hard more than anything... Parents disagree with children about having a boyfriend or a girlfriend.* (Parent, No. 01)

Most school teacher informants mentioned that adolescents had to do what their parents expected them to do, which was beyond their ability to achieve.

> *The expectations from the parents when their children leave home each day... Parents are hoping that their children go to school and their children must do what parents expect them to do.* (School teacher, No. 01)

> *Parents do not understand their children. They want their children to do this, do that, but often the children do not want to be controlled by their parents.* (School teacher, No. 03)

Some adolescents had to do what their parents wanted because they believed that their parents knew better:

> *The cause of committing suicide comes from parents who force the children to study in the areas that the children don't want to study.* (Male adolescent)

> *The cause of stress comes from different needs. Parents do not understand and have higher expectations than what adolescents want. Adolescents just want to be themselves, but they are unable to do it, which causes them pressured. Adolescents have to do what their parents want them to do... Adolescents believe that their parents know better.* (Female adolescent)

Sub-category: Lack of skills to confront problems: Most school teachers believed that encountering the stress from class assignments and having no activities to relieve the stress were the leading causes of adolescent suicide. Adolescent informants mentioned that adolescents who did not know how to cope with the worst circumstances and were unable to make good judgment when confronting problems could not find a way out and therefore felt hopeless. Adolescents were also struggling with their study subjects. Some school teachers mentioned that their students might think that they would not pass their exam for further education.

> *One teacher for eight subjects delivers eight subjects to the students, and the teachers will need the students to complete the job within months or weeks....I think that students are similar to employees in a' bolt factory' in that they have to complete orders on time. If they fail, they would miss out and the orders would also drop off.* (School teacher, No. 01)

> *The children are struggling with their study subjects. They fear that they would not pass their exam for further education.* (School teacher, No.02)

> *The children study hard, having ten lessons per day with no activities to relieve them from stress, high competition, too much tutoring, and no time to relax.* (School teacher, No.03).

Parents also feared that falling in love at school age could be one of the causes of adolescent suicide.

> *Most of the problems are about boyfriend/girlfriend relationships... fear that they have a broken heart and don't want to talk about it, fear that most of them are recovering from having an affair, etc... There was nothing for the children to be concerned about.* (Parent, No. 2)

> *Falling in love at school-age can be one of the problems.* (Parent, No. 3)

One of the school teachers also expressed that breaking up with boyfriend or girlfriend was the problem of adolescent suicide. Adolescents tend to cut themselves on their arms or wrists when encountering breaking up with boyfriend or girlfriend.

> *The adolescents who fall in love at school tend to seek attention by cutting themselves on their arms or wrists.* (School teacher, No.03)

Adolescents' inability to make good judgment was a significant cause of adolescent suicide. Some of the adolescent informants expressed that adolescents who were short-tempered, unreasonable, and unable to think carefully could feel stressed. This may cause adolescents to commit suicide.

> *Being unreasonable, not thinking carefully, doing things because of short temper, and often retaining all the stress to oneself.* (Female adolescent)

> *Not thinking carefully may make adolescents consider suicide. If adolescents are cautious, they should seek the right advice that they are looking for. However, if adolescents do it without thinking....., the outcome is unknown.* (Male adolescent)

Most of the adolescent informants mentioned that adolescents who did not know how to deal with problems when encountering one would not be able to find a way out of the worst situation and would feel discouraged.

> *Unable to find the solution to the problem or discuss with other people, and feel that there isn't a way out. Having no courage to discuss with their parents, do not know how to deal with the situation.* (These) *may result in committing suicide.* (Female adolescent)

> *Adolescents do not understand the problem and do not know how to solve problems. Adolescents do not know when the problem occurs and what direction or who to discuss with. If adolescents do not know so, it is difficult to work out the solution. The situation becomes a 'dead end' and adolescents cannot find a way out...., and this may result in committing suicide.* (Female adolescent)

Sub-category: Feeling lonely from inadequate support: Most adolescent informants expressed that they had to fight with their own weaknesses and a feeling of loneliness and had no one to talk to or understand they could consider suicide. There were those who fought with their own feelings alone:

> *It seems that adolescents are surrounded by people who do not understand. They often feel that they are alone on this planet, being treated like a 'black sheep' that is different from others. It feels like they are isolated and lonely.* (Female adolescent)

> *Adolescents have no friends, no one to talk with, and this situation may bring adolescents more stress.......Adolescents may keep thinking*

> *about the same things and try too much to find a way out.........and are unable to deal with the problem, which may result in committing suicide.* (Male adolescent)

Some of the school teacher informants also mentioned that some of their students were born into broken families, had limited resources and limited support when confronting problems:

> *Some families are broken. The parents are separated, and some children do not even know who their parents are.* (School teacher, No. 01)

> *A broken family is a family separated through divorce. Some of these children don't know who their parents are.* (School teacher, No. 02)

Schools had limited resources for students to access when students encountered some problems.

> *Teenagers are looking for someone who can help them, someone who can answer their questions. This is a rare quality and hard to find. [Not having a trusted advisor] can cause them a high level of stress.........when adolescents seek help or cannot find a way out or can't solve a problem, it can be the cause of stress, and it can prove to be too much in their lives.* (School teacher, No. 01)

Sub-Category: Lack of parental skills: Most of the parents expressed that parents who lacked skills to deal with adolescents' behaviors did not listen but shouted at children and had inappropriate expressions even when they knew that children were sensitive, and needed attention and someone who would care and understand:

> *Parents don't want to listen to their children, even about small issues. Parents are concerned but they don't know how to express their feelings... Parents are worried about their children getting back late, at 3 a.m...but they expressed their worries by shouting at their children. It is very important to have a good level of conversation with children rather than shouting.* (Parent, No. 02)

> *Some parents love their children but insult their children, which causes disappointment in the children's lives. There is a communication problem because parents express what they want differently. Even though parents love their children, they insult their children and let their children feel down...* (Parent, No. 03)

> *Adolescents are sensitive and need attention; adolescents need someone who cares about them. Adolescents need someone who can understand them...* (Parent, No. 01)

Category 2: Prevention of adolescent suicide: The prevention of suicide among adolescents was summarized into four sub-categories, 1) cultivating self-esteem, 2) parental support and caring, 3) peer support, and 4) supportive school environment.

Sub-category: Cultivating self-esteem: The parents and school teacher informants believed that cultivating self-esteem for adolescents involved teaching, guiding, understanding and acknowledging, and was the method for preventing suicide among adolescents. Most parents mentioned that parents should guide and teach children to acknowledge their own worth, and teach children not to think about suicide and to be aware of the impacts of suicide. As two mentioned:

> *I think that parents should guide the children to acknowledge their own worth and teach them not to think about suicide.* (Parent, No. 01)

> *Instill self-care into the children by teaching them about the impacts of suicide. Teach them about the impact of having love at school age, friends, and the value of money.* (Parent, No. 03)

At the same time, school teacher informants mentioned that school teachers should help students by giving love, caring, guidance, and avoid any act that could ruin student's self-esteem and avoid blaming students' weak points. As three mentioned:

> *...Cultivate students' self-esteem as one kind of essential life skills...School teachers should let students acknowledge their own worth and encourage them to be proud of themselves. Even though students are alone on this planet, they will survive if they have a positive mind.* (School teacher, No. 01)

> *...Give students love, care, and teach students to acknowledge their own lives* (worth)*...School teachers should not ruin students' self-esteem by doing things such as oppressing or blaming students for their weak points.* (School teacher, No. 02)

> *School teachers should encourage students to acknowledge their own lives* (worth), *understand and accept what's on their mind.* (School teacher, No. 03)

Sub-category: Parental support and caring: Most of the adolescent informants expressed that parental support, both physical and psychological, is a significant protective factor in the prevention of suicide among adolescents.

> *... For the prevention of suicide among adolescents, mothers can help children because they are the ones who have been looking after children since they were young and until they grow up. For anything happening in their lives, children can ask for help... Children can even share secrets with their mothers such as problems with study courses, problems with friends...., and problems with boyfriend/girlfriend.* (Female adolescent)

> *Parents should give children mental support, provide counseling, take care of them, and understand them better than others.* (Female adolescent)

Most parent informants expressed that parenting and caring by talking, listening, spending time with children, try not to complain, not try to stop their growth and show the love and care to children and being a role model for children were protective factors to support and prevent of suicide for adolescents.

> *I think* (they should) *take good care of children by discussing things openly, not insulting them or having secrets, being honest, exchanging experiences, trying not to complain or be too fussy. Talk to them and do family activities together.* (Parent, No. 03)

> *I think* (they should) *be a mentor by talking to them, giving them advice, and spending more time with them when they have problems. Mothers can be both a parent and a friend for adolescents...Don't try to stop their growth — give them freedom." I also often notice that we can observe them to see whether they talk less, are quiet, rarely eat, or are sleepless. Observe their friends, and observe whether they chat online with anyone... Parent can behave and act as a role model for the children to follow and hence influence their lives.* (Parent, No. 04)

Sub-category: Peer support: Adolescent informants mentioned that peer support was a key to the prevention of suicide among adolescents. When encountering problems, most adolescents trusted their friends more than parents since there were some issues that they could not share with their parents. At the same time, most of the parent informants expressed that peer support was an essential protective factor to help and support children with stressful life events and suicide.

> *I think that friends can take a role in preventing adolescent suicide for sure because most adolescents spend their time with each other. Adolescents trust their friends more than parents because there are some stories that adolescents can't tell parents.* (Male adolescent)

> *Friends can be a tremendous source of support such as by helping to solve the problems when adolescents have a hard time in their lives. Friends don't gossip or blame when adolescents do something wrong. Friends should understand each other's problem and lead each other in a positive direction.* (Female adolescent)

Most of the parents reported that peer support was an essential way of helping and supporting their children to deal with stressful life events and suicide.

> *I think that their friends can help them. If they are true friends, they will help each other. I don't know that they will share their problems to each other or not. However, it depends on a friend whom they are living with. Parents sometimes can also get the information about their child from their friends.* (Parent, No. 03)

> *I believe that if my child is with a good friend, they will help each other. For example, they can teach or give advice on what is bad or give warning. Friend support is very important, if they are with a good friend, they will lead each other in a positive ways.* (Parent, No. 04)

Sub-category: Supportive school environment: School teacher informants mentioned that a supportive school environment, such as providing an optional counseling service and enhancing counseling ability for school teachers, is a crucial protective factor to prevent adolescent suicide in schools. Schools should provide recreational activities for students and offer optional services for students to access help and information support for parents. Schools are crucial to the prevention of suicide for adolescents.

> *I think that a home visit is one key to the success of suicide prevention activity as it can facilitate school teachers in the prevention of adolescent suicide..., to understand and help students. School teachers should know more details about students' personal profiles. Going to visit a student's family, school teachers can also advise parents about how to recognize the warning signs of depression and suicide....* (School teacher, No.01)

> *School teachers should provide optional services for helping students access mental health services in school... providing mental health service box at the school instead of providing only counseling for a walk-in case. School teachers cannot observe their students every time... I think this is one way of helping students. If schools can provide students with recreational activities, it may help students release their pressure.* (School teacher, No. 03)

Adolescent informants expressed that counseling from school teachers could help students solve their problems. Some mentioned that school teachers should prepare themselves to help students:

> *School teachers should provide students with counseling, help students solve problems, and talk in a simple way in order to better understand students' problems.* (Male adolescent)

> *School teachers should prepare themselves to be ready to talk with students, asking students about anything happening in their lives. For example, what is on their* (student's) *mind..... and so on. School teachers should also be a good listener.* (Female adolescent)

Meanwhile, most of the school teacher informants expressed that providing counseling was a significant protective factor to prevent adolescent suicide by mentoring while students are solving their problems.

> *I think that providing counseling should not be given only when students face problems. I will give them knowledge about how to build up their self-resilience... providing counseling is not only for students who are confronting problems but for normal students as well.* (School teacher, No. 02)

> *All school teachers like school counselors or classroom teachers must provide counseling, and help students solve problems. School teachers should also be a mentor while student are solving their problems.* (School teacher, No. 03)

Discussion

This is the first qualitative descriptive study on perception of adolescent, teachers and parents regarding the causes and prevention of suicide in secondary school students in Chiang Mai, Thailand. According to the focus group discussions with adolescents and the interviews with parents and school teachers, it was found that the main cause of adolescent suicide in Chiang Mai, Northern Thai secondary school context was parents' expectations. Adolescent informants described that most adolescents were pressured by parent regarding school achievement. This finding extends previous quantitative studies in Thailand which found that emotional distress was a strong predictor of adolescent suicide.[11] However, the finding in this study is different from Western countries because of the difference in social context and cultural sensitivity. The Thai family structure is different from that of Western families. Most Thai families are extended families while Western families are nuclear families.[38] Thai adolescents must respect and obey parents and elders in their family. This is like a family rule in Thailand. Furthermore, according to Thai cultural norm, Thai adolescents are taught not to express their feelings in particular when communicating with those who are older than them, while Western adolescents generally openly express their feelings and thoughts.[39] Most of the Thai adolescents who participated in this study expressed that they felt lonely from inadequate support and lack of useful skills when encountering problems such as an inability to make good adjustment and to solve problems. Similar findings were reported from previous studies in Thailand which found that rumination and emotional distress were strong predictors of adolescent suicide.[11,12,14] They might have unpleasant feelings deep down such as depression, hopelessness and anxiety, which are related to suicide risk behaviors.

In contrast, parents and school teachers indicated that a significant cause of adolescent suicide in Thai northern secondary school context in Chiang Mai, Thailand was breaking up with a boyfriend/girlfriend. This negative life event can be one cause of adolescent suicide risk behaviors in the Thai school context. In contrast, this finding may be different from Western societies Western society because of a Thai cultural belief that falling in love while studying in secondary level is inappropriate and that having sex at school age is unacceptable in Thai society.[39] Most of the school teachers indicated that an encounter with stress from class assignments was a significant cause of Thai adolescent suicide. School teachers also mentioned that most adolescents were struggling with their study and they might think that they would not pass their examination for further education. Similar findings from Singapore report that depression partially mediated the relationship between academic stress and suicidal ideation. Adolescents are often under a great deal of academic stress and therefore may be at risk for suicidal ideation and depression.[40] Furthermore, previous studies in Thailand demonstrated that perceived negative life events in particular students who confronted problems with study courses and academic limitation was a significant cause of suicide among Thai adolescents. However, those previous findings showed only the prediction between each variable related to adolescent suicide risk behaviors but there were no data to extend on what the most significant cause of suicide among Thai adolescents is today.[11,12,15] Furthermore, school teachers stated that lack of counseling was one cause of adolescent suicide. Having limited resources for students to access when encountering problems may cause students to feel stressed and commit suicide. This finding is similar to that of a previous study indicating that school support was a great resource in preventing adolescent suicide in Thailand.[11,24]

Given the clear influence of perceptions of adolescent, teachers and parents towards causes of suicide, and the findings from this study also provided the suicide prevention in secondary school students in Chiang Mai, Thailand. It is beneficial to involve adolescents, parents and school teachers in the development of effective suicide prevention programs for Thai adolescents.[11,12,15,20,21,24] First, most of the parents and school teachers mentioned that cultivating self-resilience was a significant protective factor for preparing and enhancing adolescents' ability to deal with problems. Second, adolescents and parents stated that peer support was a great source of mental health support for preventing adolescent suicide. Third, most of the adolescents expressed that parents could give both physical and mental support when adolescents face stressful life events. Parents also stated that parental support, parenting and caring were essential protective factors of preventing adolescent suicide. Finally, supportive environments of schools, including providing counseling services and enhancing counseling ability for school teachers in schools, were significant protective factors that could save adolescents from suicide. In Thailand, prior studies examined various interventions only for the purpose of reducing depressive symptoms among Thai adolescents.[33,34]

Limitations

This study had several limitations. It was conducted with the adolescents, parents, and school teachers living in Chiang Mai Province, and therefore was unable to fully capture the cultural diversity across Thailand or to represent a larger population of adolescents, parents and school teachers.

Conclusions and Implications for Nursing Practice

This study provided information and understanding of perception of adolescent, teachers and parents towards causes and prevention of suicide in secondary school students in Chiang Mai, Thailand. The findings could be used as baseline information for health care providers, especially nurses, to design and develop effective programs and strategies for reducing causes and enhancing protective factors that related to suicide among Thai secondary school students. Moreover, the findings showed that adolescents, parents, school teacher should be engaged in the designing, implementation and evaluation of suicide prevention program for Thai secondary school.

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Referrences

1. Calear AL, Brewer JL, Batterham PJ, Mackinnon A, Wyman PA, LoMurray M, et al. The Sources of Strength Australia Project: study protocol for a cluster randomised controlled trial. Trials. 2016;17(1):349

2. Swartz KL, Kastelic EA, Hess SG, Cox TS, Gonzales LC, Mink SP, et al. The effectiveness of a school-based adolescent depression education program. Health Education & Behavior. 2010;37(1):11-22.
3. Kann L. Youth risk behavior surveillance—United States, 2015. MMWR Surveillance Summaries. 2016;65.
4. Kittiteerasack P. Trends and assessment of suicidal behavior. Journal of Science and Technology [Internet] 2012. [Cited 2014, Oct27] at http://www.tci- thaijo.org/index.php/tstj/ article/view/12636/11364) (in Thai)
5. Rungsang B, Chaimongkol N. The Prevalence of Suicidal Ideation among High School Students in Thailand and Its Potential Related Risk Factors. Thai Pharmaceutical and Health Science Journal. 2017;12(1):31-5.
6. Tittabut J. Situation analysis of adolescent attempted suicide in Chaiprakarn District, Chiang Mai Province, Thailand: Chulalongkorn University; 2011.
7. Whitlock J, Wyman PA, Moore SR. Connectedness and suicide prevention in adolescents: pathways and implications. Suicide and life-threatening behavior. 2014;44(3):246-72.
8. Andriessen K, Krysinska K. Railway suicide in Belgium 1998–2009. Crisis. 2012.
9. Tasai S, Reuchutakuln P, Thumamaporn W. Stress and Stress Coping of the High School Students in Changwat Songkhla. Journal of Education (Prince of Songkhla University at Pattani Campus). (2009); (2): 101-114. (in Thai).
10. Ministry of Education. Education in Thailand [Internet]. 2010 [cited 2017 Nov 9]. Availible from http:// en.wikipedia.org/wili/Education_in_Thailand.
11. Thanoi W, Phancharoenworakul K, Thompson EA, Panitrat R, Nityasuddhi D. Thai adolescent suicide risk behaviors: testing a model of negative life events, rumination, emotional distress, resilience and social support. Pacific Rim Int J Nurs Res. 2010;14(3):187-202.
12. Boonyamalik P. Epidemiology of adolescent suicidal ideation: Roles of perceived life stress, depressive symptoms, and substance use: Johns Hopkins University; 2005.
13. Nintachan P. Resilience and risk taking behavior among Thai adolescents living in Bangkok. (Unpublished doctoral dissertation) Virginia Commonwealth University, Richmond, VA. 2007.
14. Peltzer K, Pengpid S. Suicidal ideation and associated factors among school-going adolescents in Thailand. International journal of environmental research and public health. 2012;9(2):462-73.
15. Chaimongkol N, Deoisres W, Wongnam P. Suicidal Ideation among Thai Adolescents: An Empirical Test of a Causal Model. Pacific Rim International Journal of Nursing Research. 2017;21(2):97-107.
16. Thompson EA, Mazza JJ, Herting JR, Randell BP, Eggert LL. The mediating roles of anxiety, depression, and hopelessness on adolescent suicidal behaviors. Suicide and Life-Threatening Behavior. 2005;35(1):14-34.
17. Tusaie K, Puskar K, Sereika SM. A predictive and moderating model of psychosocial resilience in adolescents. Journal of Nursing Scholarship. 2007;39(1):54-60.
18. Kleiman EM, Liu RT. Social support as a protective factor in suicide: Findings from two nationally representative samples. Journal of affective disorders. 2013;150(2):540-5.
19. Randell BP, Wang W-L, Herting JR, Eggert LL. Family factors predicting categories of suicide risk. Journal of Child and Family Studies. 2006;15(3):247-62.
20. De Luca SM, Wyman P, Warren K. Latina adolescent suicide ideations and attempts: Associations with connectedness to parents, peers, and teachers. Suicide and Life-Threatening Behavior. 2012;42(6):672-83.
21. LeCloux M, Maramaldi P, Thomas K, Wharff E. Family Support and Mental Health Service Use Among Suicidal Adolescents. Journal of Child and Family Studies. 2016; 25(8):2597-606.
22. Stone DM, Crosby AE. Suicide prevention: state of the art review. American Journal of Lifestyle Medicine. 2014; 8(6):404-20.
23. Kerr DC, Preuss LJ, King CA. Suicidal adolescents' social support from family and peers: Gender-specific associations with psychopathology. Journal of abnormal child psychology. 2006;34(1):99-110.
24. Shilubane HN, Bos AE, Ruiter RA, Borne B, Reddy PS. High school suicide in South Africa: teachers' knowledge, views and training needs. BMC public health. 2015; 15(1): 245.
25. Robinson J, Cox G, Malone A, Williamson M, Baldwin G, Fletcher K, et al. A systematic review of school-based interventions aimed at preventing, treating, and responding to suicide-related behavior in young people. Crisis. 2013.

26. Ciffone J. Suicide prevention: An analysis and replication of a curriculum-based high school program. Social Work. 2007;52(1):41-9.
27. Strunk CM, Sorter MT, Ossege J, King KA. Emotionally troubled teens' help-seeking behaviors: An evaluation of surviving the teens® suicide prevention and depression awareness program. The Journal of School Nursing. 2014;30(5):366-75.
28. Wyman PA, Brown CH, Inman J, Cross W, Schmeelk-Cone K, Guo J, et al. Randomized trial of a gatekeeper program for suicide prevention: 1-year impact on secondary school staff. Journal of consulting and clinical psychology. 2008;76(1):104.
29. Wyman PA, Brown CH, LoMurray M, Schmeelk-Cone K, Petrova M, Yu Q, et al. An outcome evaluation of the Sources of Strength suicide prevention program delivered by adolescent peer leaders in high schools. American journal of public health. 2010;100(9):1653-61.
30. Thompson EA, Eggert LL, Randell BP, Pike KC. Evaluation of indicated suicide risk prevention approaches for potential high school dropouts. American Journal of Public Health. 2001;91(5):742.
31. Tang TC, Jou SH, Ko CH, Huang SY, Yen CF. Randomized study of school-based intensive interpersonal psychotherapy for depressed adolescents with suicidal risk and parasuicide behaviors. Psychiatry and Clinical Neurosciences. 2009; 63(4):463-70.
32. Jordan JR, McMenamy J. Interventions for suicide survivors: A review of the literature. Suicide and life-threatening behavior. 2004;34(4):337-49.
33. Kaesornsamut P, Sitthimongkol Y, Williams RA, Sangon S, Rohitsuk W, Vorapongsathorn T. Effectiveness of the BAND intervention program on Thai adolescents' sense of belonging, negative thinking and depressive symptoms. Pacific Rim Int J Nurs Res. 2012;16(1):29-47.
34. Vuthiarpa S, Sethabouppha H, Soivong P, Williams R. Effectiveness of a school-based cognitive behavioral therapy program for Thai adolescents with depressive symptoms. Pacific Rim Int J Nurs Res. 2012;16(3):206-21.
35. Lambert VA, Lambert CE. Editorail: Qualitative descriptive research: An acceptable design. Pacific Rim Int J Nurs Res. 2012; 16(4): 255-6.
36. Miles MB, Huberman AM. Qualitative data analysis: An expanded sourcebook: sage; 1994.
37. Lincoln SY, Guba EG.Naturalistic inquiry. Newbury Park: Sage Publication; 1985.
38. Sukhawaha S, Arunpongpaisal S, Hurst C. Development and psychometric properties of the Suicidality of Adolescent Screening Scale (SASS) using Multidimensional Item Response Theory. Psychiatry research. 2016;243:431-8.
39. Page RM, Yanagishita J, Suwanteerangkul J, Zarco EP, Mei-Lee C, Miao N-F. Hopelessness and loneliness among suicide attempters in school-based samples of Taiwanese, Philippine and Thai adolescents. School psychology international. 2006;27(5):583-98.
40. Ang RP, Huan VS. Relationship between academic stress and suicidal ideation: Testing for depression as a mediator using multiple regression. Child psychiatry and human development. 2006;37(2):133.

การรับรู้ของวัยรุ่น ครู และผู้ปกครองต่อสาเหตุและการป้องกันการฆ่าตัวตายในนักเรียนชั้นมัธยมศึกษาศึกษาตอนปลายในจังหวัดเชียงใหม่

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บทคัดย่อ: การฆ่าตัวตายในวัยรุ่นนับว่าเป็นปัญหาที่สำคัญทางด้านการแพทย์และสาธารณสุขในระดับโลกรวมทั้งประเทศไทย การศึกษาเชิงคุณภาพครั้งนี้ มีวัตถุประสงค์เพื่อศึกษาการรับรู้ของวัยรุ่น ครู และผู้ปกครองต่อสาเหตุและการป้องกันการฆ่าตัวตายในนักเรียนชั้นมัธยมศึกษาศึกษาตอนปลายในจังหวัดเชียงใหม่ โดยใช้วิธีการคัดเลือกกลุ่มตัวอย่างแบบเฉพาะเจาะจง ในการเก็บข้อมูลโดยการทำสนทนากลุ่มในนักเรียนมัธยมศึกษาตอนปลาย จำนวน 40 ราย และ การสัมภาษณ์เชิงลึกในกลุ่มผู้ปกครองนักเรียน จำนวน 4 ราย และ ครู จำนวน 3 ราย จากเดือน ตุลาคม 2557 ถึง เดือน กุมภาพันธ์ 2558 การวิเคราะห์ข้อมูลใช้วิธีการวิเคราะห์เนื้อหา

ผลการศึกษาพบว่า การรับรู้ของวัยรุ่น ครู และผู้ปกครองต่อสาเหตุและการป้องกันการฆ่าตัวตายในนักเรียนชั้นมัธยมศึกษาศึกษาตอนปลายในจังหวัดเชียงใหม่ จัดกลุ่มเป็น 2 หัวข้อ ดังนี้ *1) สาเหตุของการฆ่าตัวตายในวัยรุ่น* ประกอบด้วย 4 สาเหตุที่เกี่ยวกับการฆ่าตัวตายในวัยรุ่น ประกอบด้วย ความคาดหวังของผู้ปกครอง วัยรุ่นขาดทักษะการแก้ไขปัญหาเมื่อเผชิญกับปัญหา วัยรุ่นรู้สึกโดดเดี่ยวอ้างว้างเนื่องจากขาดแหล่งสนับสนุนที่เหมาะสม และ ผู้ปกครองขาดทักษะในการเลี้ยงดูบุตรวัยรุ่น *2) การป้องกันการฆ่าตัวตายสำหรับวัยรุ่น* ประกอบด้วย 4 หัวข้อ ประกอบด้วย การสร้างความมีคุณค่าในวัยรุ่น การสนับสนุนจากครอบครัว การดูแลเลี้ยงบุตรวัยรุ่น การสนับสนุนจากกลุ่มเพื่อนนักเรียน และการสนับสนุนจากทางโรงเรียน ผลการศึกษานี้ สามารถเป็นหลักฐานเชิงประจักษ์ในการพัฒนาโปรแกรมการป้องกันการฆ่าตัวตายสำหรับนักเรียนมัธยมศึกษาตอนปลาย ตลอดจนช่วยให้ ผู้ปกครอง ครู และพยาบาลโรงเรียนเข้าใจความต้องการด้านอารมณ์ของนักเรียนได้ดียิ่งขึ้น

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Competitive Sexual Risk–taking Behaviors Among Adolescents in Northern Thailand

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Abstract: This paper reports the qualitative first phase of a community-based participatory research study that explored the perceptions of behaviors and factors related to sexual risk behaviors among adolescents in northern Thailand. Adolescent community and academic researchers conducted focus group discussions with 94 adolescents aged 10-19 years old, and in-depth interviews with five females who had been pregnant in adolescence and one male who had fathered an adolescent pregnancy. Data was audio-recorded and transcribed verbatim. Content analysis was employed to analyze the data.

Two themes emerged about the adolescents: 1) social situations to rationalize sexual behaviors, which comprised peer imitation regarding sexual intercourse, online sexual relationships, drinking alcohol before having sex, living with a boyfriend/girlfriend without marriage, and having multiple partners, and 2) factors related to sexual risk behaviors, including adolescent norms regarding sexual risk, misinformation regarding sexual risk prevention, uninvolved parenting style, lack of teaching skills to convey sex education, potential risk environment in the community, and community norms regarding males' sexual behavior. Results indicated that correct and effective sexually transmitted infection prevention methods, gender equality, and motivation for condom use are important to prevent adolescent sexual risk behaviors. In addition, community-based interventions are needed to focus on different parenting skills, sex education teaching skills, and addressing community norms in order to prevent sexual risk behaviors among Thai adolescents.

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Introduction

Adolescence is the time of physical and psychosocial change from childhood to young adulthood, including exploration of new sexual experiences that may place adolescents at risk for contracting a sexually-transmitted disease and unintended

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pregnancies.[1] According to a World Health Organization report in 2015, there were more than 1 million new cases of sexually transmitted infections (STIs) every day, and among these people, most were adolescents and young adults.[2] In addition, globally approximately 21 million adolescent females aged 15-19 years become pregnant and some 3.9 million females undergo unsafe abortions every year.[3] In Thailand, the number of STIs among adolescents aged 10-19 years rose continually from 21.0 cases per 100,000 population in 2008 to 34.5 cases per 100,000 population in 2014.[4] The number of adolescent females who gave birth increased from 24.5 cases per 1,000 population in 2006 to 28.5 case per 1,000 population in 2013.[5] Early pregnancy has serious and sometimes fatal effects for some of these adolescent mothers and their babies, with some mothers dropping out of school;[6] pregnancy-induced hypertension; postpartum hemorrhage;[7] and stillbirths, abortion, and preterm birth among the infants.[8]

Adolescents are girls and boys between the ages of 10-19.[9] The 2015 National Youth Risk Behavior Survey indicated that about 41.2% of students in grades 9-12 in the United States engaged in sexual intercourse, and among these sexually-experienced adolescents, 43.1% reported not using a condom during their last sexual intercourse, and 11.5% had four or more sexual partners in their lifetime.[10] In Thailand, a report from the Bureau of Reproductive Health, Ministry of Public Health in 2014, showed that 25.9% and 17.2% of eleventh-grade male and female students had sexual intercourse, and of these, 38.8% and 35.9%, reported not using a condom during their sexual debut, respectively. In northern Thailand, a study by Aurpibul and colleagues found that 17.9% of adolescents aged 16-19 years from lowland Thai and ethnic minorities had experienced sexual intercourse. Among the sexually experienced students, 44.7% had multiple partners and 22.6% reported using condoms consistently.[11]

International and Thai studies have identified that adolescent sexual risk behaviors relate to individual, interpersonal, and environmental factors. At the individual level, lack of knowledge about sexual risk behavior prevention,[12] attitudes toward sexual risk behaviors,[13] low sexual self-efficacy,[14] being a boy,[15] and having boyfriends/girlfriends[14] influenced adolescents' engagement in sexual risk behaviors. At the interpersonal level, higher sexual risk behaviors were associated with less parental closeness,[14] low parent-adolescent communication,[16] less parental monitoring,[17] and high perceived peer norms towards engaging in sexual activity.[18] Moreover, at the environmental level, poor school connectedness,[19] exposure to pornographic media,[14] and living in disadvantaged neighborhoods[20] correlated with higher sexual risk behaviors among adolescents.

In order for Thailand to develop effective interventions to reduce the increasing rate of STIs and pregnancies among adolescents in rural community, multiple determinants, including individual, interpersonal, and environmental factors, need to be considered for better understanding of how and why Thai adolescents engage early sexual risk behaviors. In this study a community-based participatory research approach based on basic assumption of critical social theory, was the guiding theoretical framework to identify situations of adolescent sexual risk behaviors for their own community. This approach can uncover social, historical, and ideological forces and social structures to change any constraints.[21]

Methods

Design:

This paper reports the findings of a qualitative approach employed at the community assessment phase, of a larger community-based participatory research (CBPR) project, to explore adolescents' perceptions toward sexual behaviors and issues influencing adolescent sexual risk behaviors in one rural community in northern Thailand.

Study Setting and Informants:

The study informants were recruited from one community with 10 villages in Chiang Mai, Thailand during the period September 2015 and January 2016. The participants were recruited for focus group discussion

(FGDs) through purposive and snowball sampling. Inclusion criteria were: 1) males and females aged 10 to 19 years old; 2) living in the community; 3) speaking the Thai language fluently; and 4) being willing to participate.

In addition, five females who were pregnant during adolescence, and one male who fathered an adolescent pregnancy were purposively selected for in-depth interviews. Inclusion criteria were: 1) females who had been pregnant in adolescence period (10-19 years old) or males who fathered an adolescent pregnancy; 2) living in the community; 3) speaking the Thai language fluently; and 4) being willing to participate.

Ethical Considerations:

This study was approved by the Research Ethical Committee of the Faculty of Nursing, Chiang Mai University (Study code: Full-008-2558). Permission to conduct the research was also obtained from the chief executive of the sub-district administrative organization. All participants were informed about the study's purpose, the research process, and participants' rights, including confidentiality, and had opportunities to ask questions before giving informed consent. In case of participants under 18 years of age, their parents gave written consent. Before interview, permission was obtained for recording of the sessions.

Data Collection

According to key principles of CBPR of facilitating collaborative and equitable community partnerships in all research phases,[22] 11 adolescent community researchers aged 10-19 years were recruited by using a flyer in order to work with academic researchers for developing the research process plan, creating the interview guides, and data collection and analysis. All adolescent community researchers took part voluntarily and were trained to be the researchers in the community such as leadership skills, conducting an interview, and analyzing qualitative data.

After that, 23 FGDs were conducted in a meeting room in the community. The adolescent community researchers recruited the groups and took the role of interviewer, while the academic researcher arranged the room and took the role as a facilitator to assist informants in sharing their ideas and experiences. The FGDs were divided by gender (male, female, gay), age (10-13 years, 14-16 years, 17-19 years), having boyfriends/girlfriends (yes, no), and location of school (community school, urban school). The FGD guides were used to explore adolescent sexual risk behaviors nowadays, factors related to sexual risk behaviors among adolescents, and contraceptive use. Interviewers encouraged the informants to voice their opinions or their friends' experiences without telling their own stories, enabling them to more comfortably express their perspectives. Each FGD included 2-7 participants, lasted 60-90 minutes and before beginning the ground rules of focus group were agree on, in terms of respecting each other's views and confidentiality.

Six in-depth interviews were conducted at participants' preferred locations using in-depth interview guides. The questions were open-ended in nature and used to explore sexual risk behaviors, factors related to sexual risk behaviors among adolescents, and contraceptive use. The interviews lasted approximately 60-90 minutes.

Data Analysis

Content analysis was used for data analysis with the aim of identifying themes.[23] All FGDs and in-depth interviews transcribed verbatim by the principal researcher (PI). Adolescent community researchers and the PI created the coding and identified the categories; then, two co-researchers verified the categories, identified the main themes, and chose the excerpts supporting the themes to present the results.

To ensure the rigor of the study, the principles of trustworthiness of Lincoln and Guba was applied.[23] Credibility was enhanced by prolonged engagement (7 months before collecting the data) and using methodological triangulation including participant observation and interviews. Confirmability was enabled by using MP3 recorder and transcribing word by word and analyzing the data simultaneously to deeply understand the meaning of the information gained. In addition, research findings were confirmed with the co-researchers to verify accurate interpretation.

Results

Characteristics of Informants:

There were 94 adolescents who participated in FGDs, consisting of 54 females, 37 males, and 3 who identified as gay, with an average age of 14.9 years. The majority were single (n=91) and the remainder lived with a boyfriend or girlfriend. More than half attended high school (n=55), followed by elementary school (n=19), studied vocationally or for a bachelor degree (n=16), and religious school (n=4). There were 65 adolescents who studied in a community school and 29 of those studied in an urban school. A total of 35 informants reported having had a boyfriend/girlfriend and five reported engaging in sexual intercourse.

In addition, five women who had become pregnant as adolescents and one man who fathered an adolescent pregnancy participated in in-depth interview. They were 18-26 years old with an average age of 20.6 years. Three informants were pregnant at the age of 17 years and three informants were pregnant or had pregnancy at 18 years. A total of two informants graduated high school from a community school.

Sexual Risk-taking Behavior Findings:

Findings about the adolescents emerged in two main themes: 1) social situations to rationalize sexual behaviors, and 2) factors related to sexual risk behaviors.

Theme 1: Social situations to rationalize sexual behaviors

All informants perceived that current sexual risk-taking behaviors among Thai adolescents have changed compared to experiences from the past, where sex was only allowed between married couples. Compared to past methods of seeking sexual encounters, which included going to bars, attending festivals, or engaging the services of a prostitute, today's sexual behaviors have shifted towards peer imitation regarding the onset and frequency of sexual intercourse, engaging in more online sexual relationships, frequently drinking alcohol before having sex, living with a boyfriend/girlfriend without marriage, and having multiple sex partners without further personal commitment.

Peer imitation regarding sexual intercourse

All informants recognized that friends influenced them on the timing to initiate in sexual behaviors, including encouraging them to have a boyfriend/girlfriend, to plan and engage in sexual intercourse, rationalize having multiple partners, and discourage condom use. They explained that adolescents often shared their experiences in their peer groups about having boyfriends or girlfriends, and their physical feelings during sexual intercourse, which encouraged those not yet sexually active to imitate those behaviors, for example:

> *Among my friends, we discuss having sex with girls; for example, about how many girls have you had sexual intercourse with? How did you feel? Did you have fun? That makes others want to do it like that... want to know if it is fun or not... my friends say that I have to try not to use a condom... they say that using a condom during sexual intercourse is not fun.* (14-16 year-old boy)

> *We learn from our friends. One friend told us that she went out with her boyfriend and had sex last night. So we, as her friends, want to know, want to try to do it like her with our boyfriends.* (A 23-year-old woman who had been pregnant as an adolescent)

Moreover, having sexual intercourse was a competition among members of the peer group to show their popularity or attractiveness. Both adolescent males and females had to have sexual intercourse with multiple partners in order to be the winner in their group.

> *Now, there is a game called "Collecting a point* (La Tam)*" in a peer group... that means everyone in the group has to have sex with a boy. If you have sex with one boy, you will get one point. The one who gets the highest point will be the winner and will get a gift from their friends.* (14-17 year-old gay)

> *Adolescents' language calls this type of behavior, increasing the level of sexual encounters, as an "up-level." This means that with every sexual encounter, you attempt to "go up a level" from your previous encounter. For example, after finishing college, I called a girl and picked her up to have dinner and asked her to have sex. After we had sex, my friend called me to talk and drink at a bar. I met another girl there and had sex with her. So, I had sex with two girls in one day. That brought my level up to two.* (17-19 year-old boy)

Online sexual relationships

Most informants perceived that online social networks were an important tool for starting new relationships and maintaining interpersonal relationships among adolescents today. They explained that adolescents chatted or posted their marital status as single via social networks such as Facebook, and Line, and used a chat application in order to find a new boyfriend or girlfriend. Then, they continued their relationships by texting messages and made an appointment to meet each other, which placed them at risk for sexual intercourse.

> *We use Facebook and Line to chat or flirt with boys or girls. During texting messages, a boy sometimes wants to meet a girl in person, and once they see each other, the boy takes the girl to a motel to have sex.* (14-16 year-old girl)

> *At that time, he asked me to accept him to be his friend* [i.e., on Facebook]. *When I added him to be my friend, he always chatted and commented on my posted pictures... We then used the text box to chat and make a date to see each other. He picked me up at my home to go to his house. I went with him because I thought that he wanted me to see his house, I did not think of anything else. In his house, he prevented me from getting out and raped me.* (An 18 year-old girl who had been pregnant)

In addition, some focus group informants talked about how adolescents who intended to have sexual intercourse with a casual partner used chat rooms to show their body or sexual behavior and arrange for a place to have sex.

> *Chat rooms are the best. It's used for finding sexual relationships. You can both see them and hear their voice. Boys masturbate. Girls show their breasts or other parts of their body. And then they make a date to have sex.* (14-17 year-old gay)

> *In a chat room, some men took a photo of their body, and asked for having sex... but some men sent video clips while chatting.* (14-16 year-old girl)

Drinking alcohol before having sex

Some adolescents drank alcohol, such as sparkling wine, beer or spirits before having sexual intercourse. They indicated that drinking alcohol was a social behavior that they performed while going out with friends or boyfriends/girlfriends at night. Adolescents drank alcohol to make relationships easy and to increase their courage to have sex. Most of them talked about how heavy alcohol consumption caused memory loss, and caused some to engage in unintended sex:

> *Going out at night to a pub or bar and drinking alcohol improves the atmosphere. I think that having sex for the first time does not come only from love, but also from the desire to make love. Drinking alcohol can lead adolescents to have more courage to have sex.* (17-19 year-old boy)

> *I went out with my boyfriend and drank beer and spirits until I was drunk. At that time, I forgot I went home with him; I had not had sex with him before this. I don't remember much. My boyfriend took me to his bedroom... When I woke up, we did not have any clothes on in the morning. I cannot remember how I felt about my sexual debut.* (A 26-year-old woman who had been pregnant as an adolescent)

Living with a boyfriend/girlfriend without marriage

Most informants pointed out that there were several adolescent couples living together in boys' or girls' home in the community or a dormitory in town. They explained that living with a boyfriend/girlfriend was the way to express their love; thus, they used protection inconsistently.

> *There are a lot of adolescents living with their boyfriends/girlfriends now ... When I was studying at high school, my friend took her boyfriend to live together at her home. She lived with her parents, too.* (17-19 year-old girl)

> *During a school break, I asked my parents for permission to live with my boyfriend. They told me to protect myself but I and my boyfriend did not use condoms regularly... We lived together, for about two or three weeks, we lived together every day. So, my boyfriend did not use condoms every time... I forgot to take contraceptive pill. This caused me to become pregnant.* (A 20-year-old woman who had been pregnant as an adolescent)

Having multiple partners

The majority of informants stated that adolescents nowadays had sexual intercourse with multiple partners and that some of them switched their partner with their friends to have sex. They defined having multiple partners as having sexual intercourse with their boyfriends/girlfriends and others who they might meet one time or whom they were flirting with as "Kik". Some believed that having sexual intercourse with strangers was fun, and that they learned new sexual behaviors.

> *My friend called me to go his room at a dormitory in town. Another friend went there but I didn't go... There were three girls and three boys drinking alcohol and having sex together. Some of them didn't know each other... Maybe, they were bored with their girlfriends or wanted to do something new.* (14-16 year-old boy)

> *When I heard from a friend how good she felt during having sex, I wanted to find a new partner to also have sex. When I felt dissatisfied because his penis was small, I found another partner. When I met a boy whose penis fit me, I continued to look for someone else better than him.* (A 23-year-old woman who had been pregnant as an adolescent)

Theme 2: Factors related to sexual risk behaviors

Several personal, family, school, and community factors lead Thai adolescents to engage in sexual risk behaviors, including adolescent norms regarding sexual risk behavior, misinformation regarding sexual risk behaviors prevention, uninvolved parenting style, lack of teaching skills to convey sex education, potential risk environment in the community, and community norms regarding males' sexual behavior.

Adolescent norms regarding sexual risk behavior

Adolescent norms in regards to having sex and not using a condom was the factor that posed the greatest risk for contracting a sexual transmitted disease or carrying an unwanted pregnancy. Most informants felt that having sex during this period of their lives was a normal behavior, especially having sex around holidays such as Valentine's Day or the Loi Krathong festival, demonstrating that the couples loved each other.

> *I have friends in town. It's a normal behavior. For them, having sex among adolescence period is a normal.* (17-19 year-old girl)

> *In the past, if a boy and a girl wanted to have sex, they had to be engaged or married, but it's not like that in the present... because of this new era, everything has changed. When an adolescent boy and girl have sex, then they separate, no ties, they don't have to be married. It's fun. You see! It's normal that adolescents have sex with their boyfriends or girlfriends.* (An 18-year-old boy who fathered an adolescent pregnancy)

Moreover, informants mentioned that adolescents had the attitude towards not using a protection, especially condom use. Some of the adolescents believed that having their first sexual intercourse would not make them pregnant. Adolescent females explained that they believed that when an adolescent is entering puberty, his or her sexual capabilities are not fully developed enough to cause pregnancy. Therefore, some adolescents did not use contraceptive methods at their sexual debut.

> *Not using a condom. Just one time. Something bad couldn't happen... Most boys think that having sex without a protection for one time can't make a girl pregnant.* (17-19 year-old boy)

> *At the first time [of having sex], I asked him how we would continue if I became pregnant. He answered that I could not become pregnant because it was the first time we had sex. You see? No one is pregnant after the first sex.* (A 20-year-old woman who had been pregnant as an adolescent)

Some explained that they do not usually use a condom during sexual intercourse because it will dull their sexual feeling and decrease physical contact.

> *Most boys don't use condoms... Their sexual feeing may be less. It means if boys stop sexual activity to find and use a condom, their sexual feeling may discontinue.* (14-16 year-old girl)

> *It's a different feeling. I cannot explain how I feel during using a condom; it's strange, not fun. Having sex without condoms is more fun than with using condoms.* (An 18-year-old boy who fathered an adolescent pregnancy)

Misinformation regarding sexual risk behaviors prevention

Most informants stated that adolescent males used the withdrawal method (coitus interruptus) as a means to prevent pregnancy, for example:

> *I asked him [her boyfriend] about condoms. He answered, 'I don't have any condoms. We don't need to use condoms.' He said that he would withdraw his penis from my vagina before ejaculation. He told me that this method can prevent pregnancy. He can feel it before the fluid will come out.* (10-13 year-old girl)

> *Using the withdrawal method can't make a girl pregnant... A boy will ejaculate semen outside, not inside. A girl cannot be pregnant.* (14-16 year-old boy)

In addition, some females in in-depth interviews mentioned that females usually were not aware of their sexual risk exposure when they went home with their boyfriends. They thought that the boys would respect them if the girls did not want to engage in a certain behavior.

> *We learned sexual and reproductive health superficially, or just the basics, such as the reproductive system and conception. I did not know what risks to expect when I began living with a boyfriend. I did not know how I can protect myself. I did not know how to avoid pregnancy until I faced the situation by myself.* (A 26-year-old woman who had been pregnant as an adolescent)

> *At the first time, I stayed at my house. He asked to talk to me outside. I trusted him. We talked near his house. Then, he invited me in for a while. I said no but he didn't listen to me. He carried me to go his room.* (A 20-year-old woman who had been pregnant as an adolescent)

Uninvolved parenting style

Most informants said that parents in Thailand today worked hard to earn enough money to support their families and had no time to monitor their children's behavior outside of the home. This parenting style led adolescents to spend a great deal of time with friends, and their boyfriends/girlfriends, in order to share their personal experiences and feel love and warmth. And some of them exchanged sex for money with strangers.

> *I have a close older friend, age 14, who was pregnant. At that time, I went to find her at her house to figure out the reason she was absent from school for the past two weeks. She told me she was pregnant and did not know who the father of her child was. I know she works at night and some days she is alone at home because her parents work at night too. She told me that she wanted to be rich and she had sex with men whom she met one time. Now, she aborted the baby.* (10-13 year-old girl)

> *Parents don't pay attention to their children, so they go to their friends' house and have sex... They told their parents that they would do homework at their friends' house. Parents didn't know. (10-13 year-old boy)*

Lack of teaching skills to convey sex education

Most informants believed that sex education in school was an important information source for adolescents to learn about sex and risk prevention, but some teachers were limited when they taught about sexual issues by low confidence, poor explanations, and not enough up-to-date information in their teaching approaches.

> *When I was a student in a community school, I learnt sex education such as sexual risk behaviors but I didn't learn about prevention... Maybe the teacher didn't know the detail of sex education or teaching methods. So, how can the students understand?* (17-19 year-old girl)

> *They [the teachers] don't teach everything in sexual education because they are too shy to say anything about sex issues. And their teaching style is often boring, which make us lose interest in the subject.* (An 18-year-old boy who fathered a teenage pregnancy)

Potential risk environments in the community

Many informants mentioned that there were sexual risk locations in their community, where adolescents get together to drink alcohol and have sex, for example:

> *There are a lot of places in the community where adults usually don't go, such as the woods next to a community street, or by the dam. At these places, we go to drink alcoholic beverages and smoke. Some of us take the girls to these places to have sex... There is no guard or anyone else to monitor us. There is only one person to open and close the dam entrance.* (14-16 years-old boy)

> *At my school, there were some young adolescents who had sex in the restroom. The teacher caught them and expelled them... Adolescents go to have sex in the restroom because there is no light and very few people go to the restroom. So, teachers usually don't know about this.* (14-16 years-old girl)

Community norms regarding males' sexual behavior

Many informants in this community believed that sexual intercourse experience for males was a normal behavior. Engagement in sexual risk behavior among males had been accepted since the past because males's experience of sexual intercourse was not derogatory. Conversely, females' engagement in sexual intercourse would make them and their families miserable. Therefore, having sexual intercourse among males was not prohibited, and parents and teachers did not teach them much about sexual risk prevention.

> *We are boys. We don't have anything to lose. We can have sex with anyone. Parents are not worried. But the girls cannot act like this. They can be pregnant. Boys cannot be pregnant.* (14-16 years-old boy)

> *When the boys have sex with the girls, the boys cannot get pregnant, right? Boys don't lose anything, but the girls do... everyone always says that when parents have a female baby, it is like having a toilet in the front of the house, which is a bad thing in Thailand. But parents don't talk like this when they have a male baby.* (A 26-year-old woman who had been pregnant as an adolescent)

Discussion

Findings support previous studies that demonstrate that social situations play an important role in the decision-making process of adolescents in their sexual behaviors. These include observing and imitating sexual behaviors among their peer groups,[24, 25] using the Internet to find an anonymous partner,[26] drinking alcohol to lower sexual anxiety and inhibitions, and having multiple sex partners to increase status among their peers.[11] The informants explained that both boys and girls usually shared with their peers such details as initiation and frequency of sexual intercourse and having multiple sex partners. A study found that adolescent females in eastern Thailand who reported having pregnant friends were 2.2 times more likely to have unintended repeat pregnancies than those who did not have such friends.[27] Drinking alcohol before engaging in high-risk sexual intercourse was a frequent occurrence;[28] specifically, in these situations, the females consumed more alcohol than the males.[29]

Our results confirmed that Thai adolescents' sexual risk behaviors frequently were based on inappropriate sexual risk prevention knowledge,[30, 31] uninvolved parenting style,[32] lack of teaching skills to convey sex education,[33] and different community norms regarding males' sexual behaviors.[34] We found that community norms around the males' sexual behaviors were more accepting of premarital sexual activity. However, the females perceived that the community norms were a double standard for them; while it was acceptable for males to have sex, it was not acceptable for females to do the same. The situation for the females had more significant social consequences, because community members would put shame and blame on them for becoming pregnant at an early age, and parents and community members actively tried to prevent females from having sexual intercourse. These findings were consistent with traditional norms among adolescents aged 15 to 19 years in three villages in northeast Thailand. The researchers found that losing virginity before marriage was unacceptable for females, and that community and family members made the females feel guilty and embarrassed.[34] In this community, both males and females primarily focused on pregnancy prevention rather than STIs/HIV prevention. They also believed that coitus interruptus was a method which could prevent females from becoming pregnant. From a survey of 425 adolescent females aged 15 to 18 years old in the city of Chiang Mai, nearly 10% of girls who ever had sex reported using coitus interruptus as a contraceptive method in their first sexual intercourse.[30]

Our study discovered that adolescent females and males in northern Thailand competed with each other in having multiple partners to demonstrate their popularity and acceptance by their peers. In addition, we found that not using condoms among these adolescents quickly became the norm as the means to experience greater sexual closeness and satisfaction. They also shared the mistaken belief that having sex for the first time could not make them pregnant, because they thought that their sexual organs were not mature enough to cause a pregnancy.

The study has some limitations. First, informants in this study were collected from a single community in northern Thailand, which does not allow us to generalize to other areas of the country. Second, informants were recruited by adolescent community researchers, who presented sexual risk behaviors from a rural perspective. Last, most of informants were not sexually active so some might feel reluctant to voice their opinions toward sexual risk-taking behaviors in the focus groups. These limitations are offset by the important findings which will contribute to recommendations not only to local policymakers but also contribute to informing the national agenda to reduce teen pregnancy and lower the rates of sexually-transmitted infections.

Conclusions and Implications for Nursing Practice

Thai adolescent sexual risk behaviors revealed in our focus groups included peer imitation regarding sexual intercourse, online sexual relationships, drinking alcohol before having sex, living with a boyfriend/girlfriend without marriage and having multiple sex partners. These sexual risk behaviors are strongly influenced by personal, interpersonal, and community norms. Interventions need to focus on debunking the myths surrounding pregnancy prevention, addressing gender equality, and educating adolescent peers, parents, teachers, and other community members in order to prevent or reduce sexual risk behaviors in this young and vulnerable population.

This findings suggested that nurses should consider gender sensitivity and community norms in providing accurate information and strengthen effective skills, particularly sexual refusal self-efficacy among female adolescents, for pregnancy prevention, and promoting positive condom use.

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References

1. Steinberg L. Risk taking in adolescence new perspectives from brain and behavioral science. Curr Dir Psychol Sci. 2007; 16(2): 55-9.
2. World Health Organization. Global estimates shed light on toll of sexually transmitted infections. 2015 [cited 2018 Feb 21]. Available from: http://www.who.int/reproductivehealth/news/stis-estimates-2015/en/
3. World Health Organization. Adolescent pregnancy. 2018 [cited 2018 Feb 15]. Available from: http://www.who.int/mediacentre/factsheets/fs364/en/
4. Areechokchai D. Sexually transmitted disease (STD) in teenage, Thailand, 2010-2017. Weekly Epidemiological Surveillance Report, Thailand. 2015; 46(5): 65-7 [in Thai].
5. Bureau of Reproductive Health, Department of Health, Ministry of Public Health. Statistics on adolescent birth, Thailand 2013. 2014 [cited 2016 Nov 15]. Available from: http://rh.anamai.moph.go.th/ewt_dl_link.php?nid=34

6. Lloyd CB, Mensch BS. Marriage and childbirth as factors in dropping out from school: An analysis of DHS data from sub-Saharan Africa. Popul Stud. 2008; 62(1): 1-13.
7. World Health Organization. The sexual and reproductive health of younger adolescents: Research issues in developing countries. Geneva: World Health Organization; 2011.
8. Prakash R, Singh A, Pathak PK, Parasuraman S. Early marriage, poor reproductive health status of mother and child well-being in India. J Fam Plann Reprod Health Care. 2011; 37(3): 136-45.
9. World Health Organization. Strengthening the adolescent component of HIV/AIDS and reproductive health programmes: A training course for public health managers. Geneva: World Health Organization; 2011.
10. Centers for Disease Control and Prevention. Youth risk behavior surveillance-United States, 2015. Morbidity and Mortality Weekly Report. 2016; 65(6): 1-180.
11. Aurpibul L, Tangmunkongvorakul A, Musumari PM, Srithanaviboonchai K, Tarnkehard S. Patterns of sexual behavior in lowland Thai youth and ethnic minorities attending high school in rural Chiang Mai, Thailand. PLoS ONE. 2016; 11(12): e0165866.
12. Chamratrithirong A, Kaiser P. The dynamics of condom use with regular and casual partners: Analysis of the 2006 National Sexual Behavior Survey of Thailand. PLoS ONE. 2012; 7(7): e42009.
13. Oluwole DA, Adeyemi MA, Oyebiyi DA. Predictive influence of factors predisposing secondary school adolescents dropouts to sexual risk behaviour in Ogun State. Ife Psychologia. 2013; 21(1): 361-86.
14. Atwood KA, Zimmerman R, Cupp PK, Fongkaew W, Miller BA, Byrnes HF, et al. Correlates of precoital behaviors, intentions, and sexual initiation among Thai adolescents. J Early Adolescence. 2012; 32(3): 364-86.
15. Townsend JM, Wasserman TH. Sexual hookups among college students: Sex differences in emotional reactions. Arch Sex Behav. 2011; 40(6): 1173-81.
16. Harris AL, Sutherland MA, Hutchinson MK. Parental influences of sexual risk among urban African American adolescent males. J Nurs Scholarsh. 2013; 45(2): 141-50.
17. Rhucharoenpornpanich O, Chamratrithirong A, Fongkaew W, Rosati MJ, Miller BA, Cupp PK. Parenting and adolescent problem behaviors: A comparative study of sons and daughters in Thailand. J Med Assoc Thai. 2010; 93(3): 293-300.
18. Bingenheimer JB, Asante E, Ahiadeke C. Peer influences on sexual activity among adolescents in Ghana. Stud Fam Plann. 2015; 46(1): 1-19.
19. Mmari KN, Kaggwa E, Wagman J, Gray R, Wawer M, Nalugoda F. Risk and protective correlates of young women's first sexual experiences in Rakai, Uganda. Int Perspect Sex Reprod Health. 2013; 39(3): 153-62.
20. Lindberg LD, Orr M. Neighborhood-level influences on young men's sexual and reproductive health behaviors. Am J Public Health. 2011; 101(2): 271-4.
21. Chinn PL. Critical theory and emancipatory knowing. In Butts JB, Rich KL. Philosophies and theories for advanced nursing practice. 2nd ed. Burlington: Jones & Bartlett Learning; 2015, pp. 139-158.
22. Israel BA, Eng E, Schulz AJ, Parker EA. Methods for community-based participatory research for health. San Francisco: Wiley; 2012.
23. Lincoln YS, Guba EG. Naturalistic inquiry. London: SAGE; 1985.
24. Piumwattanasup A, Chantaluk S. Factors relating to sexual behaviors of early adolescents: Case of adolescents in Pattaya City's school, Chon Buri Province, 2007. Office of Disease Prevention and Control 3 Chonburi Journal. 2009; 2(2): 56-68 [in Thai].
25. Ali MM, Dwyer DS. Estimating peer effects in sexual behavior among adolescents. J Adolesc. 2011; 34(1): 183-90.
26. Hong Y, Li X, Mao R, Stanton B. Internet use among Chinese college students: Implications for sex education and HIV prevention. Cyberpsychol Behav. 2007; 10(2): 161-9.
27. Aeamsamarng P, Srisuriyawet R, Homsin P. Risk factors of unintended repeat pregnancy among adolescents. The Public Health Journal of Burapha University. 2013; 8(1): 55-66 [in Thai].
28. Apakupakul N. Sexual relation and condom use in teenagers and young adults at teens clubs: A case study in Bangkok. Songklaagarind Medical Journal. 2006; 24(6): 475-82 [in Thai].
29. Morrison-Beedy D, Grove L, Ji M, Baker E. Understanding the "why" for high-risk behavior: Adolescent girls' motivations for sex. J Assoc Nurses AIDS Care. 2017; 28(6): 877-87.
30. Muangjai T. Predictability of self-control, knowledge in sex education and family communication concerning opposite sex friends on sexual risk behaviors of female adolescent students [master's thesis]. [Chiang Mai (Thailand)]: Chiang Mai University; 2012. 104 p. Thai.

31. Bozicevic I, Stulhofer A, Ajdukovic D, Kufrin K. Patterns of sexual behaviour and reported symptoms of STI/RTIs among young people in Croatia--implications for interventions' planning. Coll Antropol. 2006; suppl 2: 63-70.
32. Okhakhume AS. Influence of self-esteem, parenting style and parental monitoring on sexual risk behaviour of adolescents in Ibadan. Gender & Behaviour. 2014; 12(2): 6341-53.
33. Timmerman G. Teaching skills and personal characteristics of sex education teachers. Teaching and Teacher Education. 2009; 25(3): 500-6.
34. Sridawruang C, Crozier K, Pfeil M. Attitudes of adolescents and parents towards premarital sex in rural Thailand: A qualitative exploration. Sex Reprod Healthc. 2010; 1(4): 181-7.

การมีพฤติกรรมเสี่ยงทางเพศที่ท้าทายของวัยรุ่นไทยในภาคเหนือของประเทศไทย

เสาวลักษณ์ เศรษฐีกุล วารุณี ฟองแก้ว นงค์คราญ วิเศษกุล วราภรณ์ บุญเชียง Joachim G. Voss*

บทคัดย่อ : การวิจัยเชิงปฏิบัติการแบบมีส่วนร่วมโดยใช้ชุมชนเป็นฐานครั้งนี้มีวัตถุประสงค์เพื่อศึกษาพฤติกรรมและปัจจัยที่เกี่ยวข้องกับพฤติกรรมเสี่ยงทางเพศของเด็กวัยรุ่นในพื้นที่ภาคเหนือของประเทศไทย โดยได้มีการพัฒนาศักยภาพแกนนำนักวิจัยวัยรุ่นในชุมชนในการรวบรวมข้อมูลด้วยการสนทนากลุ่มวัยรุ่นที่มีอายุ 10-19 ปีจำนวน 94 ราย และการสัมภาษณ์เชิงลึกผู้หญิงที่เคยตั้งครรภ์ในช่วงวัยรุ่นจำนวน 5 ราย และผู้ชายที่ทำให้วัยรุ่นหญิงตั้งครรภ์จำนวน 1 ราย ข้อมูลที่ได้มาจากการบันทึกเทปเสียงระหว่างการสนทนาและถอดเทปแบบคำต่อคำ สำหรับการวิเคราะห์ข้อมูลได้ใช้วิธีการวิเคราะห์เชิงเนื้อหา

ผลการวิจัยจำแนกเป็น 2 ประเด็นคือ 1) สถานการณ์ทางสังคมที่เกี่ยวข้องกับพฤติกรรมทางเพศของเด็กวัยรุ่น ประกอบด้วย การเลียนแบบการมีเพศสัมพันธ์ในกลุ่มเพื่อน การมีสัมพันธ์ทางเพศแบบออนไลน์ การดื่มแอลกอฮอล์ก่อนการมีเพศสัมพันธ์ การอยู่ร่วมกันกับแฟนก่อนแต่งงาน และการมีคู่นอนหลายคน และ 2) ปัจจัยที่เกี่ยวข้องกับพฤติกรรมเสี่ยงทางเพศ ประกอบด้วย ค่านิยมทางเพศของเด็กวัยรุ่น การมีความรู้เกี่ยวกับการป้องกันพฤติกรรมเสี่ยงทางเพศที่ไม่ถูกต้อง การเลี้ยงดูของผู้ปกครองแบบปล่อยปละละเลย การขาดทักษะการถ่ายทอดความรู้เรื่องเพศ การมีพื้นที่เสี่ยงต่อการมีเพศสัมพันธ์ในชุมชน และบรรทัดฐานของชุมชนเกี่ยวกับการมีพฤติกรรมทางเพศของผู้ชาย ผลการวิจัยครั้งนี้แสดงให้เห็นว่า การให้ความรู้เกี่ยวกับการป้องกันการติดเชื้อทางเพศสัมพันธ์ที่ถูกต้อง ความเสมอภาคทางเพศ และการกระตุ้นให้เกิดการใช้ถุงยางอนามัยเป็นสิ่งสำคัญอย่างยิ่งต่อการป้องกันพฤติกรรมเสี่ยงทางเพศในเด็กวัยรุ่น ดังนั้น การพัฒนารูปแบบและกลยุทธ์เพื่อป้องกันพฤติกรรมเสี่ยงทางเพศในเด็กวัยรุ่นในสังคมไทยจึงต้องเน้นการพัฒนาทักษะการเลี้ยงดูของผู้ปกครอง การถ่ายทอดความรู้เรื่องเพศของครูสอนเพศศึกษา และต้องคำนึงบรรทัดฐานของชุมชนนั้นๆ

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คำสำคัญ: เด็กวัยรุ่น, การวิจัยเชิงปฏิบัติการโดยใช้ชุมชนเป็นฐาน, พฤติกรรมเสี่ยงทางเพศ, ประเทศไทย

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Effectiveness of Diabetes Self – Management Education in Thais with Type 2 Diabetes

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Abstract: Diabetes is a major health problem and economic burden around the world including Thailand. Patient self-management is an important key to help patients control their disease and prevent complications. This study aimed to evaluate a self-management education program in Thais with type 2 diabetes. A retrospective cohort study was performed in 488 people with type 2 diabetes attending the diabetes self-management education program by multidisciplinary team and 488 people who did not attend the program. Mean differences in hemoglobin A1c and diabetes medication utilization as dispensed from the hospital's pharmacy (adjusted to define daily dose) between baseline and follow ups were computed using mixed-effect regression analyses. Cost-benefit was analyzed as a difference between the direct cost of conducting the program and the benefit. Satisfaction, diabetes knowledge and behavioral changes were collected in the intervention group.

Results revealed that during the two-year follow up, mean differences in hemoglobin A1c reduction were similar between the two groups. However, the intervention group had a statistically significant reduction in diabetes medication utilization, compared to non-intervention group, especially during the second year. Cost-benefit analysis demonstrated that the diabetes self-management education program provided a cost saving. The intervention group increased their diabetes knowledge, changed diabetes self-care behaviors, and had high satisfaction with the program. Thus, this Diabetes Self-Management Education Program in Type 2 Diabetes is effective and associated with cost savings. Self-management program should be integrated as a routine nursing practice to improve outcomes in people with type 2 diabetes.

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Introduction

Diabetes mellitus is one of the most common non-communicable diseases affecting people around the world. The International Diabetes Federation (IDF) estimated that 451 million people worldwide

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had diabetes in 2017 and the number is expected to rise to 693 million by 2045[1]. Unfortunately, most people with diabetes live in low- and middle-income countries. Uncontrolled diabetes can lead to macrovascular and microvascular complications, including stroke, heart disease, blindness, renal failure, and lower limb amputation[2]. In 2017 an estimated 5.0 million deaths worldwide were directly caused by diabetes[1]. World Health Organization (WHO) reported that 2.2 million deaths were attributable to high blood glucose[3]. Diabetes also causes a significant economic burden. In 2012, an estimated 245 billion USD was spent on diabetes in the United States alone[4]. Thailand, an upper-middle income country, experiences a similar burden from diabetes. The prevalence has risen from 7.5% in 2009 to 8.9% in 2014 [5,6]. The cost of diabetes care in 2010 was estimated at 906,374 USD in Thailand or 11% of the total global health expenditure[7]. The most recent survey in 2014 revealed that only 23% of people with type 2 diabetes were considered under good glucose control[6].

Strong evidence suggests that good glucose control can significantly reduce or delay microvascular complications.[8] While there are numerous available diabetes medications, lifestyle modification consisting of diet and exercise remains a cornerstone in achieving good glycemic control.[2] The person's knowledge and ability to self-manage their disease is a vital part of diabetes care. Therefore, it is recommended that people with diabetes receive Diabetes Self-Management Education (DSME), usually delivered by diabetes educators or a multidisciplinary team, to enhance essential skills and knowledge in managing their diabetes[2]. As medication cost contributes to a significant expense in diabetes care, patients who are empowered in their self-care and adopt a healthy lifestyle could lead to reduced medication utilization[2]. This, along with potential reduction in complications as a result of improved glycemic control, can lead to cost savings. Therefore, cost benefit analysis and medication utilization should be a part of DSME program's evaluation[9].

Review of Literature

DSME provides people with diabetes and caregivers or family members with knowledge and skills to perform self-care and lifestyle changes in order to manage diabetes more effectively[2]. In a systematic review, DSME was associated with a significant reduction in hemoglobin A1c (Hb A1c) levels, a marker of glycemic control, by 0.57%. [10] If maintained in the long term, this could translate to a significant decrease in complications since a 1% reduction in HbA1c was associated with 25% reduction in microvascular complications and 21% for death-related to diabetes[8]. In addition, a meta-analysis of randomized controlled trials found that the delivery of DSME program was cost-effective.[11] Hendrie and colleagues [12] studied the cost and effectiveness of the diabetes management education program (DMEP) in person with type 2 diabetes. The cost for the 6 month intervention period was 356 USD per person. They found that an individualized DMEP was effective in reducing the number of hyperglycemia and hypoglycemia episodes with incremental cost effectiveness ratio (ICER) of 39 USD per glycemic-symptoms day avoided, compared with usual care. The study by Prezio and colleagues [13] explored the long term effects of DSME intervention program led by community health worker in uninsured Mexican Americans on health outcomes and cost effectiveness. The results revealed a significant reduction in HbA1c levels and development of foot ulcers, compared to usual care. There was an average of 0.056 quality-adjusted life year (QALYs) gained per person over 20 years with an ICER of 355 USD per QALY, compared with usual care. [13]

Despite the growing burden of diabetes care and evidence supporting the effectiveness of DSME, such programs in Thailand are not uniform and the national standard has not been established.[14] A few studies have explored the efficacy of DSME programs in Thailand, up to 6-month follow up. There were three studies that found a significant reduction in HbA1c levels, between 0.14-0.59%.[15-17] But, the other studies did not find improvements.[18-19] Self-efficacy, self-management, knowledge and quality of life increased.[18,19] Wattana and colleagues [16] studied the effects of a DSME program on glycemic control, coronary heart disease risk, and quality of life in 147 persons with type 2 diabetes. The findings indicated that the intervention group, who received DSME program, had a significant reduction in HbA1c level and coronary heart disease risk, and an increase in quality of life compared to the non-intervention group. Another DSME program study in Thais with type 2 diabetes by Jaipakdee and colleagues[15] found that the DSME program was associated with a significant reduction in HbA1c level (-0.14%), fasting plasma glucose (-6.37 mg/dl), along with an increase in health behavior scores and quality of life.

When evaluating for health economic aspects, four approaches are available[20], cost-minimization, cost-benefit, cost-effectiveness, and cost-utility analysis. Each of these methods has the same input and cost. The four techniques are different in output or outcome; same outcome for cost-minimization, benefits in monetary term for cost-benefit analysis, efficacy or effectiveness in natural units (e.g. life years gained or clinical values) for cost-effectiveness analysis, and natural units adjusted by utility (e.g. quality-adjusted life years (QALYs) or disability- adjusted life years (DALYs) for cost-utility analysis. However, there has not been a study evaluating cost-benefit of such programs in Thailand, or a study with a longer follow up period. This is an essential component of the program's evaluation, especially at the current study site which is a tertiary care hospital in a university setting, providing care for over 10,000 people with diabetes each year.

Research Question:

Is structured DSME program in Thailand associated with cost savings, reduced medication utilization, improved glycemic control, increased diabetes knowledge, behavioral changes and satisfaction in people with type 2 diabetes?

Study Aim:

The aim of this study was to evaluate the effectiveness of the structured DSME program on cost-benefit, medication utilization, glycemic control, diabetes knowledge, behavioral changes and satisfaction in Thais with type 2 diabetes in a tertiary medical center in Thailand.

Methods

Design: Economic evaluation research design by a retrospective cohort study was used.

Sample and Setting: Participants in this study had type 2 diabetes and were being followed up at one university hospital in Bangkok, Thailand from January 2014- December 2015. The inclusion criteria including having HbA1c values at follow up by attending physicians at least once during this period. Exclusion criteria were people with non-type 2 diabetes (i.e. gestational diabetes, type 1 diabetes, or other types of diabetes) and those without HbA1c values. The intervention group was composed of those who met the inclusion criteria and attended the DSME program in addition to routine care. The non- intervention group was composed of those who met the same inclusion criteria but received only routine care without DSME program.

During this period, there were 613 people with type 2 diabetes who received the DSME program. Of these, 448 met all the inclusion criteria and were allocated to the intervention group. The non-intervention group was retrieved by electronic medical records. For this, electronic medical records from January 2014- December 2015 were searched for persons with diagnosis code ICD-10 E1. This yielded 11, 134 persons. They were matched with each individual in the intervention group at a 1:1 ratio by age (± 5 years), gender and the same time of follow up at the clinic. In addition, further matching of HbA1c levels was attempted to minimize the differences between the two groups. The sample and setting are shown in **Figure 1.**

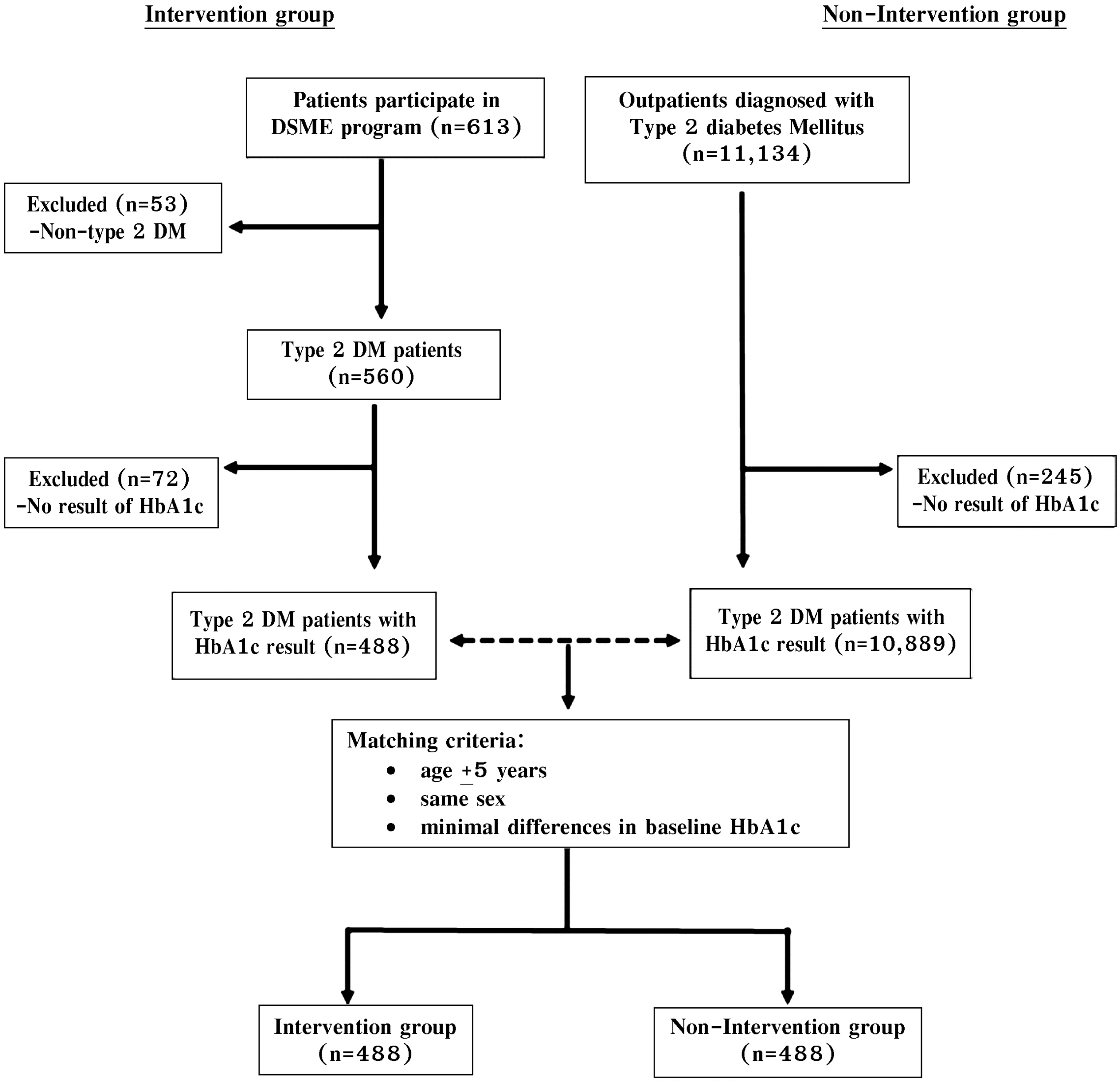


Figure 1 Flow of the study

Ethical considerations: The study protocol was approved by the Institutional Review Board Committee, Faculty of Medicine Ramathibodi Hospital, Mahidol University. (The approval number COA no. 04-59-60, date May 13, 2016).

Instruments and outcomes Measure:

Medical records of the intervention groups were retrospectively reviewed regarding their diabetes knowledge scores (before and after the class), satisfaction scores, and whether they met their behavioral goals upon follow ups. Ramathibodi's Diabetes Self-Management Education record form developed by two advanced practice nurses (APNs) and one physician who specialized in diabetes for use in routine practice in DSME program, consist of 4 parts:

1) **Personal information sheet**, used to obtain data on the demographic characteristic such as age, sex, education background, duration of disease, complications, comorbidities including the diagnoses of hypertension, dyslipidemia, diabetes retinopathy and ischemic heart disease/ stroke.

2) **DSME/S sheets**, used to obtain data on any prior diabetes education, outline the DSME contents along with behavior goal setting/ evaluation.

3) **Satisfactory evaluation sheet**, a one-item survey asking the participants to rate their overall satisfaction of the program with a score ranging from 0 to 5, with 5 being most satisfied.

4) **Diabetes knowledge** assessment (pre/ posttest), simple 10 multiple choices/ true-false questions (total 10 points) to assess the participants' diabetes knowledge before and after the session. Higher scores indicate higher knowledge. The reliability measured using Kuder-Richardson (KR-20) formula in 30 persons with type 2 diabetes was 0.80. The content of Ramathibodi's DSME record form was validated by a endocrinologist, two advanced practice nurses and a nursing faculty who specialized in diabetes care

HbA1c levels were obtained from laboratory database of the same university hospital. HbA1c assays were performed using the Turbidimetric inhibition immunoassay (TINIA) method, which has been certified by where there have a standardization and quality control from the National Glycohemoglobin Standardization Program (NGSP). The unit of measurement was reported in percent (%).

Diabetes medications used (i.e., drugs under the Anatomical Therapeutic Chemical group A10A or A10B), both oral and injectable forms, were obtained from the electronic medical records. This was derived from the actual filled medications at the hospital's pharmacy. It was a normal practice for most, but not all patients at our hospital. The medication utilization was adjusted to defined daily dose (DDD). DDD was calculated as (items issued x amount of drug per item) / World Health Organization (WHO) DDD; where WHO DDD is the assumed average daily maintenance dose for a medication utilization for its main indication in adults, independently of price and dosage form.[21]

Cost of daily diabetes medications per patient was calculated at 8 time points. The direct cost of conducting the DSME program was calculated as cost per patient per program and consisted of the following: facility cost, teaching supplies, office equipment, telephone follow-up cost, staff's salaries and data management cost. Other potential costs including pre and post admission costs were not included in this analysis.

Intervention: The DSME program activities are shown in Table 1. The program was delivered by a multidisciplinary team including endocrinologists, two APNs, staff nurses, and dieticians. The content was based on the 7 skills of self-management, including healthy eating, being active, monitoring, taking medications, problem solving, reducing risks, and healthy coping, as defined by the American Association of Diabetes Educators[9]. Delivery techniques were a combination of lecture-based strategy and individual assessments. The content took approximately half a day to deliver, after which the participants were given 1-2 behavior goals according to their medical and personal needs. The participants were then asked to follow up within 2-3 months, usually with their next physician appointments. During the follow up visits, they met with an APN to discuss the individual goal achievements and assess any barriers. The APN continued to empower and motivate any further behavioral changes as needed, or encourage the participants to maintain their self-care behaviors. Lastly, additional information and resources, and plan for the future self-care goal were offered as needed. The patients continued to receive their usual diabetes care from their physicians during this period (**Table 1**).

Table 1: Content and activities of the DSME program

Session/time (7skill of self-management)	Content/Activity	**Multidisciplinary**
FIRST VISIT		
Session1 (30 min) -What is diabetes? -Reducing risks	**Activity**: Lecture with PowerPoint presentation. Question and answer session at the end, using two way communication **Content**: The pathophysiology of diabetes , complications, treatments, self-management, sick day care, Immunization, reducing risk and monitoring	Endocrinologist APN
Session 2 (30min) -Foot care	**Activity**: watching VDO on foot care **Content**: Diabetic foot complication and foot care	Nurse Foot care VDO
Session 3 (30min) -Being active/Exercise	**Activity**: Exercise practice led by APN, along with supplemental exercise VDO **Content**: The benefits of exercise and physical activity, type of exercise, discussing barriers, exercise cautions, encourage participants to choose an appropriate exercise/physical activity, and practice exercising	APN Exercise VDO
Session4 (70 min) (15 min/station) 4 training stations -Healthy eating -Taking medication -SMBG/hypoglycemia (Monitoring) -Foot screening (Monitoring)	**Activity**: Skill training / practice **Content**: participants were divided into 4 groups for skill training and practice. Each station contains behavior assessments, barriers and facilitator evaluation, educating and skill training based on individualized needs. **Healthy eating**: Food 24 hr recall, food exchange, healthy plate, and individualized meal plan. **Taking medication**: Action of oral medications and insulin as used by the participants, food and drug relationship, proper medication taking and compliance, insulin injection techniques. **SMBG/hypoglycemia**: SMBG skill and technique, interpret and record SMBG data, hypoglycemia recognition and treatment: 15 -15 rule, preventing and monitoring hypo/hyperglycemia. **Foot screening**: risk assessment of diabetic foot ulcer, self-monitoring skill. Those deemed at high risk of diabetic foot complication were referred to surgical clinic specializing in diabetic foot at the same hospital	Multidisciplinary -APN -Nurses -Dieticians
Session 5 (10 min) -Problem solving -Healthy coping -Reducing risks	**Goal setting**: two behavioral goals were set in mutual agreement with each participants. These goals were based on individual problems as evaluated from the sessions. One goal is typically related to dietary intake, and the other was based on individual needs. The participant received a short note containing these goals as a reminder. **Participants completed knowledge assessment test and satisfaction survey before leaving.**	Multidisciplinary -APN -Nurses -Dieticians
SECOND VISIT (FOLLOW UP VISIT: in 2-3 months)		
Session 6 (30 min) -All skill evaluation	**Follow up**: discuss the individual goal achievements and assess any barriers. APN continued to empower and motivate any further behavioral changes as needed, or encourage the participants to maintain their self-care behaviors. Additional information and resources, and plan for the future self-care goal were offered as needed.	APN

Data collection

Since this study was a retrospective cohort study all information was extracted from medical records. Data related to personal information was extracted once at the beginning of the first visit (session 1-4 of the program). The diagnoses of hypertension, dyslipidemia, diabetes retinopathy and ischemic heart disease/ stroke were obtained from ICD10. Diabetic knowledge was obtained before and after the first visit of the program, whereas satisfaction with the program was obtained at the end of the program. HbA1c levels, diabetes medication utilizations were extracted from medication records every 2-3 months at the time of follow up till 24 months for eight times. Estimated glomerular filtration rates (eGFR) were extracted from laboratory database.

Statistical analyses:

Data are presented as mean ± SD or frequency (%). Independent t-tests or Chi square were used to compare differences in characteristics between groups, as appropriate.

Mixed-effect regression analyses were performed, adjusting for hypertension and dyslipidemia, to evaluate the mean differences (MD) between intervention and non-intervention groups in their changes in HbA1c levels and DDD between baseline and each time point. The analyses were performed using Stata, version 14.2.

Cost-benefit analysis was performed from the hospital perspective to compare direct cost of conducting the DSME program as input or incremental cost, and difference of diabetes medication cost in monetary term as outcome or incremental benefit. The direct cost included the staff's salaries, calculated in proportion to the time they devoted to the program, facility cost, and any miscellaneous cost of conducting the program. The difference between the incremental benefit and the incremental cost was then calculated per person and compared. In detail, the incremental benefit was the difference in diabetes medication cost between baseline and 24 months in the intervention and non-intervention groups, as follows: [(average daily medication cost in the intervention group at 24 month - baseline) - (average daily medication cost in the non-intervention group at 24 month- baseline)] x 730. Costs are expressed in Thai Baht (THB) and converted to USD using 35 Baht/US$[22].

In addition, one-way sensitivity analysis was performed by varying the cost of diabetes medications (generic vs. original formula), staff salaries (±10%), facility cost (±10%), and the number of patients (±10%).

Results

The study flow chart is shown in **Figure 1** and the characteristics of the participants in the intervention and non-intervention group are shown in **Table 2**. There were no statistically significant differences between groups with the exception that more participants in the intervention group had retinopathy than those in the non-intervention group (p<0.001).

Table 2: Characteristics of the participants

Characteristics	Control (n = 488)	Intervention (n =488)
Age, years, mean ±SD	59.6 ± 12.1	59.8 ± 12.4
Male, n (%)	198 (40.6)	198 (40.6)
Baseline HbA1c (%), mean±SD	8.4 ± 2.0	8.4 ± 1.9
Baseline eGFR , mL/min/ 37.1m^2, mean ±SD	78.4 ± 29.7[a]	74.1 ± 30.9[b]
Comorbidity diagnosis, n (%)		
Diabetic retinopathy	77 (15.8)	149 (30.53)
Hypertension	341 (69.9)	328 (67.2)
Dyslipidemia	318 (65.2	319 (65.4)
Chronic ischemic heart disease and Stroke	80 (16.39)	84 (17.21)

[a]n=369, [b]n=391

For the intervention group, diabetes knowledge increased significantly after the education session (8.9 ± 2.0 vs. 9.9 ± 1.4, $p<0.001$, n=331). Satisfaction with the program was high with 96.9% of participants scoring their satisfaction at 4 or 5 (out of 5, n=387). Ninety-two percent of those with complete available data (n=347) reported that they met one or more of the behavioral goals during their follow up visits.

HbA1c reduction

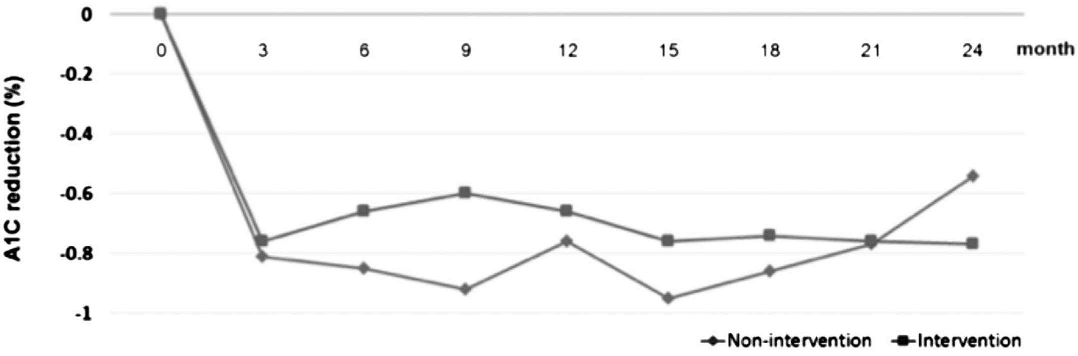
Figure 2 illustrates HbA1c reduction during follow up period, compared to baseline. Both groups had improvements in their glycemic control as reflected by a reduction in HbA1c levels. There were no significant differences in adjusted mean differences (MD) in HbA1c between groups throughout the follow up period, with the exception of a better glycemic control in the non-intervention group at 9-month.

Diabetes medication utilization

Figure 3 reports changes in diabetes medication utilization in the two groups of participants, 369 participants in the non-intervention group and 391 participants in the intervention group. At baseline, the intervention group had significantly higher diabetes medication utilization than the non-intervention group. Overall, the intervention group had a reduction in their DDD during a follow up period, while the non-intervention group had an increase. The intervention group had a significant reduction in their DDD compared to the non-intervention group at 9, 15, 18, 21, and 24 month.

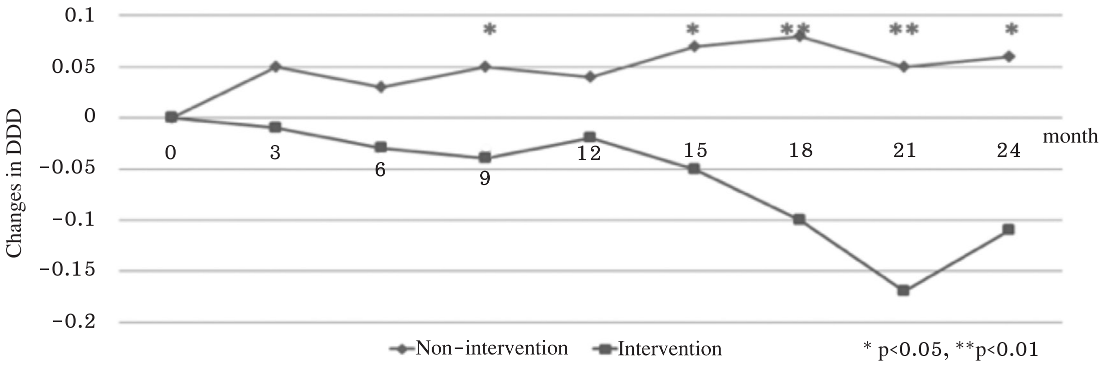
Medication cost savings

Changes in the cost of diabetes medications are illustrated in **Figure 4**. Both groups had increased in diabetes medication cost overtime, especially during the first 12 months. However, during the second year, the cost of the medication in the intervention group remained relatively steady, while it continued to increase in the non-intervention group. At 24 months, the increased cost of the medication in the intervention group was 11.57 THB/person/day (approximately 0.33 USD) (at 24 months of 70.68 vs. baseline of 59.11 THB/person/day), and in the non-intervention group was 20.50 THB/person/day (approximately 0.59 USD)(at 24 months of 64.24 vs baseline 43.74 THB/person/day). Therefore, the intervention group had a smaller increase of their diabetes medication cost, compared to the non-intervention group, with a saving of 8.93 THB/person/day at 24-month (approximately 0.26 USD). This is equivalent to saving 6,517.37 THB/person over the 2-year period (approximately 186.21 USD).



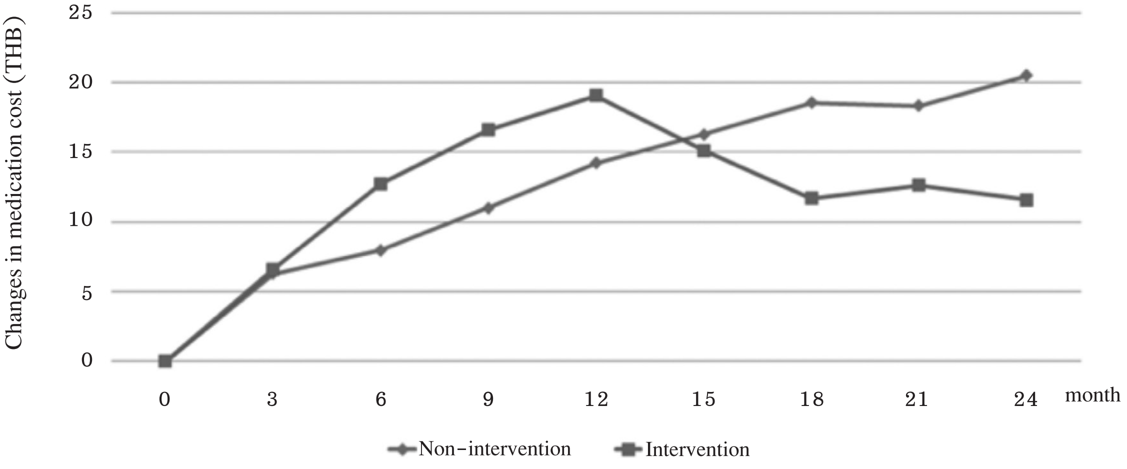
Adjusted mean difference in A1c	0.01	0.21	0.26	0.10	0.17	0.14	-0.01	-0.24
95% Confidence interval	-0.21, -0.23	-0.03, 0.46	0.00, 0.52	-0.15, 0.35	-0.11, 0.46	-0.13, 0.42	-0.33, 0.32	-0.61, 0.11
N Intervention	414	394	391	378	316	253	208	159
N Non-intervention	310	305	294	281	272	241	255	221

Figure 2 Changes in HbA1c levels during the follow up period



Adjusted mean difference in DDD	-0.05	-0.07	-0.10	-0.06	-0.13	-0.19	-0.23	-0.16
95% Confidence interval	-0.11, 0.01	-0.15, 0.02	-0.19, -0.01	-0.16, -0.03	-0.24, -0.02	-0.32, -0.06	-0.37, -0.08	-0.32, -0.01
N Intervention	455	441	432	425	415	358	288	226
N Non-intervention	331	316	303	291	283	270	256	242

Figure 3 Changes in diabetes medication utilization, expressed as defined daily dose (DDD) during the follow up period



Difference in Cost (THB)	-0.30	-4.79	-5.58	-4.88	-1.14	6.85	5.71	8.93

Figure 4 Changes in the cost of diabetes medications during the follow up period

Cost-benefit analysis

The cost of conducting the DSME program per person was calculated at 3,382.29 THB/person (approximately 97 USD). Thus, considering the saving from diabetes medication cost, the program provided a saving of 3,135.08 THB/person/program (approximately 90 USD).

Sensitivity analysis of the program's net benefits was performed. The range of saving had the greatest variation when considering the formulas of the medications:

generic vs. original formula, saving 202.84 THB (approximately 6 USD) vs. 16.516.62 THB (approximately 472 USD). The savings did not vary greatly when considering staff's salaries, facility cost and the number of the patients (±10%).

Discussion

In this retrospective cohort study of 976 people with type 2 diabetes in a tertiary care setting in Thailand, we found that those receiving structured DSME had improved glycemic control, which was sustained during a 2-year follow up, similarly to those who did not receive DSME but were receiving care at the same facility during the same period. However, the DSME program was associated with a reduction in daily diabetes medication utilization, and cost savings of 3,135.08 THB/person/program (approximately 90 USD) over the 2-year period. Additionally, satisfaction with the program was high, diabetes knowledge increased, and behavioral goals were met in a majority of the participants. This result supported the feasibility, effectiveness and cost-benefit of a structured DSME program in Thailand, an upper-middle income country with growing burden of diabetes care.

In the current study, the degree of glycemic improvement associated with DSME, 0.6-0.7% reduction in HbA1c, was similar to those previously reported in Western countries[10], as well as in Thailand.[16] This effect size could translate into a significant reduction in microvascular complications if maintained in the long term[8], and is equivalent to the potency of some of diabetes medications.[2] The efficacy was maintained during the 2-year follow up, which consistent with some previous studies[23,24], although not all demonstrated such long-lasting effects.[25] However, the glycemic improvement seen in the intervention group was not different from those not attending DSME but who were receiving care at the same hospital. The improvement in glycemic control in the non-intervention group, however, was achieved at the expense of a continuous increase in diabetes medication utilization, especially during the second year. This is consistent with a known progressive nature of type 2 diabetes mellitus. While the actual reasons for a lesser increase in medication utilization in the intervention group were not explored in this study, this was likely due to behavioral changes and a better understanding of their diabetes, as reflected by increased diabetes knowledge and reportedly meeting the behavioral goals among the participants (although the details of how each participant monitored their diabetes were not available). Previous research demonstrated that that DSME led to better self-care including diet, exercise and improved medication adherence[26]. Reduction in medication utilization could be possibly associated with less adverse effects including hypoglycemia, which should be explored in future studies.

Given the reported average cost of diabetes care in Thailand between 1,328- 6,331 THB per patient per year (37.94-180.89 USD)[7,27], this cost-saving could be quite significant, especially if confirmed in a larger study involving other health care facilities in the country. This saving varies depending upon the formula of the medications, which in this study was calculated as the actual medication cost, and to a lesser degree the administrative cost of the program delivery. This finding was consistent with those previously reported in Mexican Americans that diabetes education delivered by community health workers was associated with an incremental cost-effectiveness ratio of USD 355 per quality-adjusted life year gained[13], attributed by better glycemic control, lower foot ulcerations and amputations. In our study, only medication utilization was considered, therefore, the potential savings could include further reduction in complications and hospitalization cost, especially if the glycemic control is maintained. This should be further explored.

Strengths and Limitation:

Our study has strengths of being the first to explore the cost-saving of DSME program in Thailand, including a relatively large number of participants, and a follow up period of 2 years. However, there are limitations. This was not a randomized controlled trial as we did not feel that not delivering DSME in research participants was appropriate. Despite the attempt to match the participants, the intervention groups appeared to have more severe disease, as they had more medication utilization at baseline despite having similar HbA1c levels to the non-intervention group. Nevertheless, the study revealed that they had a smaller increase in their medication utilization over the two-year period, compared to the non-intervention group. Data on diabetes medication utilization were not available in all participants, which could be due to the fact that they were diet-controlled or received their medications outside our hospital. However, the numbers of participants without medication utilization information were similar between the two groups. Nonetheless, the study demonstrated effectiveness of the DSME program in our patient group. In addition, the current structured DSME program was established in late 2013. Prior to that, DSME was delivered but not in a systematic fashion. We could not exclude the possibility that the non-intervention participants had received DSME prior, or from other sources outside the program. The expense of the program also did not include indirect costs from the patients and their families. The study was conducted in only one tertiary medical center and the findings may not be generalized to other patient groups. Lastly, other outcomes such as quality of life or other complications were not explored in the current study.

Conclusion

A structured DSME program in Thailand was associated with a slower increment in diabetes medication utilization and cost-savings, along with increased patients' diabetes knowledge and satisfaction. This could serve as a model for developing countries where diabetes continues to be a significant health and economic burden. Further research should explore the benefit of such program in other parts of Thailand, along with other outcomes such as complications and quality of life.

Implications for Nursing Practice:

The diabetes self-management education program should be a part of diabetes care in hospitals at all levels in Thailand, and should be adopted as a policy at the national level. Currently, some hospitals have diabetes nurses or advance practiced nurses but some do not. However, to provide effective DSME, all hospitals should be staffed with a diabetes nurse, along with a multidisciplinary team, who are trained in diabetes self-management education and support. This will allow individualized support for people with diabetes as they have different characteristics, problems and need different nursing interventions. The current program could also serve as a model of care for other chronic diseases.

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Reference

1. Cho NH, Shaw JE, Karuranga S, Huang Y, da Rocha Fernandes JD, Ohlrogge AW, et al. IDF Diabetes Atlas: Global estimates of diabetes prevalence for 2017 and projections for 2045. Diabetes research and clinical practice. 2018.
2. American Diabetes Association. Standards of medical care in diabetes-2017. Diabetes Care. 2017;40:S1-S142.
3. World health organization. Global report on diabetes 2016. [cited 2017 March13]. Available form http://apps.who.int/iris/bitstream/10665/204871/1/9789241565257
4. Centers for disease control and prevention. diabetes 2014 report card. .[cited 2017 April 4]. Available form http://www.cdc.gov/diabetes/pdfs/library/diabetesreportcard2014.pdf
5. Aekplakorn W, Chariyalertsak S, Kessomboon P, Sangthong R, Inthawong R, Putwatana P, et al. Prevalence and management of diabetes and metabolic risk factors in Thai adults: the Thai National Health Examination Survey IV, 2009. Diabetes Care. 2011;34(9):1980-5.

6. Aekplakorn W. Thai national health examination survey V. Institute. Nonthaburi: Health Systems Research; 2016
7 Zhang P, Zhang X, Brown J, Vistisen D, Sicree R, Shaw J, et al. Global healthcare expenditure on diabetes for 2010 and 2030. Diabetes research and clinical practice. 2010; 87(3):293-301.
8. UK Prospective Diabetes Study (UKPDS) Group. Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33). Lancet 1998;352(9131):837-53.
9. American Association of Diabetes Educators. The art and science of diabetes self-management education desk reference. 2nd ed. Chicago: American Association of Diabetes Educators; 2011.
10. Chrvala CA, Sherr D, Lipman RD. Diabetes self-management education for adults with type 2 diabetes mellitus: A systematic review of the effect on glycemic control. Patient Educ Couns. 2016;99(6):926-43.
11. Lian JX, McGhee SM, Chau J, Wong CKH, Lam CLK, Wong WCW. Systematic review on the cost-effectiveness of self-management education programme for type 2 diabetes mellitus. Diabetes Res Clin Pract. 2017;127:21-34.
12. Hendrie D, Miller TR, Woodman RJ, Hoti K, Hughes J. Cost-effectiveness of reducing glycaemic episodes through community pharmacy management of patients with type 2 diabetes mellitus. The Journal of Primary Prevention. 2014;35(6):439-49.
13. Prezio EA, Pagán JA, Shuval K, Culica D. The community diabetes education (CoDE) program: cost-effectiveness and health outcomes. Am J Prev Med. 2014;47(6):771-9.
14. Reutrakul S, Deerochanawong C. Diabetes in Thailand: Status and Policy. Curr Diab Rep. 2016;16(3):28.
15. Jaipakdee J, Jiamjarasrangsi W, Lohsoonthorn V, Lertmaharit S. Effectiveness of a self-management support program for Thais with type 2 diabetes: Evaluation according to the REAIM framework. Nurs Health Sci. 2015;17(3):362-9.
16. Wattana C, Srisuphan W, Pothiban L, Upchurch SL. Effects of a diabetes self-management program on glycemic control, coronary heart disease risk, and quality of life among Thai patients with type 2 diabetes. Nurs Health Sci. 2007;9(2):135-41.
17. Saengtipbovorn S, Taneepanichskul S. Effectiveness of lifestyle change plus dental care (LCDC) program on improving glycemic and periodontal status in the elderly with type 2 diabetes. BMC Oral Health. 2014;14(1):72.
18. Wichit N, Mnatzaganian G, Courtney M, Schulz P, Johnson M. Randomized controlled trial of a family-oriented self-management program to improve self-efficacy, glycemic control and quality of life among Thai individuals with Type 2 diabetes. Diabetes Res Clin Pract. 2017;123:37-48.
19. Ounnapiruk L, Wirojratana V, Meehatchai N, Turale S. Effectiveness of a behavior modification program for older people with uncontrolled type 2 diabetes. Nurs Health Sci. 2014;16(2):216-23.
20. Drummond MF SM, Claxton K, Stoddart GL, and Torrance GW. Methods for the economic evaluation of health care programmes. New York: Oxford University Press; 2015.
21. Norwegian Institute of Public Health .Guidelines for ATC classification and DDD assignment 2017. [cited 2017 May 13]. Available from https://www.whocc.no/filearchive/publications_guidelines_web.pdf.
22. Bank of Thailand. Rates exchange of commercial banks [cited 2017 May 13]. Available from https://www.bot.or.th/english/_layouts/application/exchangerate/exchangerate.aspx
23. Williams IC, Utz SW, Hinton I, Yan G, Jones R, Reid K. Enhancing diabetes self-care among rural African Americans with diabetes: results of a two-year culturally tailored intervention. The Diabetes Educator. 2014;40(2):231-9.
24. Piatt GA, Anderson RM, Brooks MM, Songer T, Siminerio LM, Korytkowski MM, et al. 3-Year follow-up of clinical and behavioral improvements following a multifaceted diabetes care intervention. The Diabetes Educator. 2010;36(2):301-9.
25. Tang TS, Funnell M, Sinco B, Piatt G, Palmisano G, Spencer MS, et al. Comparative effectiveness of peer leaders and community health workers in diabetes self-management support: results of a randomized controlled trial. Diabetes Care. 2014;37(6):1525-34.
26. Murray CM, Shah BR. Diabetes self-management education improves medication utilization and retinopathy screening in the elderly. Primary Care Diabetes. 2016; 10(3):179-85.
27. Riewpaiboon A, Pornlertwadee P, Pongsawat K. Diabetes cost model of a hospital in Thailand. Value Health. 2007;10(4):223-30.

ประสิทธิผลของโปรแกรมการสร้างความรู้และทักษะการดูแลตนเองในผู้เป็นเบาหวานชนิดที่ 2 ของไทย

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สาวิตรี ชาญชาติ** อารยา หาอุปละ** ประไพ อริยประยูร** พัชรวีร์ ทันละกิจ** ปิยานุช ไมตรีจร
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บทคัดย่อ: โรคเบาหวานเป็นปัญหาสุขภาพ และภาระเศรษฐกิจทั่วโลกและประเทศไทย การดูแลจัดการตนเองของผู้เป็นเบาหวานเป็นกุญแจสำคัญในการควบคุมโรค และป้องกันภาวะแทรกซ้อน การวิจัยนี้เพื่อศึกษาประสิทธิผลของโปรแกรมการสร้างความรู้และทักษะการดูแลตนเองในผู้เป็นเบาหวานชนิดที่ 2 เป็นการศึกษาวิเคราะห์ย้อนหลังในผู้เป็นเบาหวานชนิดที่ 2 จำนวน 488 รายที่เข้ารับโปรแกรมโดยทีมสหสาขาวิชาชีพ และผู้ที่ไม่ได้รับโปรแกรม เพื่อเปรียบเทียบค่าน้ำตาลเฉลี่ยสะสม และการใช้ยาของผู้ป่วย (แปลงเป็นหน่วยขนาดยามาตรฐานต่อวัน) ระหว่างก่อน และหลังเข้าโปรแกรม ความคุ้มค่าของการบริการ และเก็บข้อมูลความพึงพอใจ ความรู้ และการปรับเปลี่ยนพฤติกรรม วิเคราะห์ข้อมูลโดยสถิติถดถอยการเปรียบเทียบตัวแปรแบบผสม

ผลการศึกษาพบว่าหลังได้รับโปรแกรม 2 ปี ค่าน้ำตาลเฉลี่ยสะสมลดลงใกล้เคียงกันทั้ง 2 กลุ่ม กลุ่มที่ได้รับโปรแกรมมีการใช้ยาเบาหวานลดลงอย่างมีนัยสำคัญเมื่อเทียบกับกลุ่มที่ไม่ได้รับโปรแกรม โดยเฉพาะในปีที่ 2 โปรแกรมนี้ประหยัดค่าใช้จ่ายเมื่อเทียบต้นทุนและประโยชน์ที่ได้รับ กลุ่มที่ได้รับโปรแกรม มีความรู้เพิ่มขึ้น มีการปรับเปลี่ยนพฤติกรรมการดูแลตนเอง และมีความพึงพอใจสูงขึ้น ดังนั้นโปรแกรมการสร้างความรู้และทักษะการดูแลตนเองในผู้เป็นเบาหวานมีประสิทธิภาพและลดค่าใช้จ่าย จึงควรบูรณาการโปรแกรมนี้สู่การปฏิบัติการพยาบาล เพื่อพัฒนาผลลัพธ์ในการดูแลผู้เป็นเบาหวานชนิดที่ 2

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คำสำคัญ: ค่าใช้จ่าย, ความคุ้มค่าของการบริการ, ประสิทธิผล, ค่าน้ำตาลเฉลี่ยสะสม, การใช้ยา, สร้างความรู้และทักษะการดูแลตนเอง, เบาหวานชนิดที่ 2

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Predictors of Perceived Quality of Care in People with Heart Failure

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Abstract: Understanding patients' perception of quality of care is a crucial step in improving healthcare service, but understanding patients' experiences of quality of care is limited, including those with heart failure. This predictive descriptive study aimed to: describe perceptions of quality of care among people with heart failure and determine factors influencing their perception of quality of care including preferences for participation in care, symptom distress, and patient-related factors of age, gender and education. Convenience sampling was used to recruit 92 participants with heart failure at one tertiary university hospital in Bangkok, Thailand. The measures used were Personal Characteristics Questionnaire, Control Preference Scale, Memorial Symptom Assessment Scale-Heart Failure and the Quality of Care from Patients' Perspectives Questionnaire.

The results revealed that most participants reported balanced-high quality of care. The most distressing symptom was difficulty when lying flat, and symptom distress and preference for participation in care were significant predictors of patients' perception of quality of care. Participants with high preference for participation (passive-shared, collaborative) perceived quality of care lower than participants with low preference for participation (passive). The findings of this study can be used to design nursing intervention programs for managing symptom distress and promoting patient participation in care to improve perceived quality of care among patients with heart failure during hospitalization.

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Keywords: Care participation, Heart failure, Patient-related factors, Quality of care Symptom distress

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Introduction

Heart failure (HF) is an increasingly prevalent health problem that affects 1-3% of the global adult population (over 26 million people).[1] In Thailand HF exerts a major burden on health resources; despite low prevalence of 0.4% of the adult population, it accounts for 19% of total hospitalizations,[2] with high rates of readmission.[3] High rates of readmission for HF are associated with the progression of the underlying

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disease and the reporting of poor perceived quality of care (QOC) during hospitalization.[4]

The World Health Organization[5] (WHO) considers QOC to be a serious concern even in well-developed heath care systems. According to WHO, QOC is defined as "the extent to which health care services provided to individuals and patient populations improve desired health outcomes" (p.9[5]). QOC is, therefore, an essential element to achieve successful outcomes in patient care. Importantly, patients as service users are considered as a vital source of information for reflecting the existing care received.[6] QOC from patients'perspectives is the most influential component and is increasingly used as an indicator of QOC in general.[6-8] Studies consistently support that improved patient perception of QOC is associated with higher QOC.[4, 9-11] Better perceptions of QOC are associated with shorter length of stay[10] and lower risk of hospital readmission.[4, 11]

QOC is a multidimensional concept in its nature, and the relative importance of its dimensions vary according to the context, such as in terms of time and culture; the individual, organizational or social levels; and the perspectives involved, including those of patients, relatives, medical personnel, policy makers and researchers.[7, 8]

Patients'perceptions of QOC have been widely studied in many populations such as cancer,[12, 13] and diabetes.[14] However, there is a dearth of research on persons with HF perceived QOC, despite HF being one of the most prolific critical challenges facing hospitals.[2] Moreover, many studies evaluated the service care quality in terms of satisfaction with care,[15-17] which may have different meanings, and global satisfaction questions cannot measure all important aspects of perception of QOC.[18]

Previous studies found that perception of QOC was influenced by individuals'preferences for participation,[15, 19] person-related factors and illness characteristics such as age,[17, 20] gender,[17, 20, 21] education,[20] and symptom distress.[12, 16, 22] However, research findings have been inconclusive across research studies to date. Knowledge regarding QOC from persons with HF perspectives is very limited. Furthermore, no reports of perceived QOC and its influencing factors conducted among Thai persons with HF were found. Thus, the current study investigated the perceived QOC and the factors influencing it in Thais with HF during hospitalization in order to address this research gap.

Conceptual Framework and Review of Literature

The conceptual framework used to guide this study was based on the theoretical model for QOC from patients' perspectives developed by Wilde,[8] and the literature review of patients' perceived QOC. This model was formative in shifting the measurement of QOC away from health professionals' evaluation toward patient perceptions, which has subsequently guided research in numerous patient populations, such as diabetes,[14] palliation,[23] and operative.[24] According to Wilde,[8] QOC from patients'perspectives is formed by patients' norms, expectations and experiences and by previous and current encounters with care. The two core elements of this model are patients' preferences and resource structure of care organization. The resource structures are person-related qualities pertaining to the caregivers, and physical and administrative environmental qualities that refer to infrastructural components of the care environment, such as organizational rules and technical equipment. Patients' preferences consist of a rational aspect that refers to the patient's wish for order, predictability and calculability in life, and a human aspect that refers to the patient's expectations that her/his unique situation is taken into account.[8] In the context of patients with HF receiving care during hospitalization, patients' preference refers to their expectations of wanting to take a role in their situation at a particular level; for instance, some patients benefit from more active participation in hospital care, such as contributing to their care plan, in terms of improving their perceived QOC.[15] Patients' preferences for participation in their own care has been increasingly recognized as a key component for QOC improvement to date.[25] Patients who prefer to actively participate in treatment tend to rate their QOC as better than patients who prefer passive participation,[19] although some studies were reported that preference for participation in care was not associated with perception of QOC in persons with cancer.[12, 13] However, there is a lack of data accordance with preference for participation in care on persons with HF focusing on their perception of QOC. Moreover, patients' preference for participation in care is highly subjective, depending on the context and circumstance.[25] Therefore, the influence of patients' preference for participation in care on patients' perception of QOC among Thai persons with HF is an interesting and important research area that needs further exploration.

Previous studies indicate patients' perception of QOC differs according to patient-related characteristics such as age,[17, 20] gender,[17, 20, 21] education,[20] and illness-related factors such as symptom distress.[12, 16, 22] Older patients have a more positive perception of QOC.[20, 21] Females tend to rate QOC higher than males,[20, 21] and patients with higher education tend to rate QOC lower than patients with lower education.[20] Low symptom distress is generally associated with improved perceptions of QOC.[16, 22] However, QOC from persons with HF perspectives has received little scientific attention. Consequently, this study aimed to describe perception of QOC, and investigate the predictive relationship of patients' preference for participation in care, symptom distress, age, gender, education and perceived QOC in persons with HF during hospitalization.

Methods

Design: A predictive descriptive study.

Sample and Setting: The sample size was estimated using the G* power program version 3.1. Based on previous similar studies[19, 26] the average probability of perceived high QOC was 0.77 and odd ratio was 2.93. In this study, using an alpha of 0.05, and power of 0.90, the estimated required sample size was 94. Two medical units at one tertiary university hospital in Bangkok, Thailand were used to collect data. Convenience sampling was used based on the following inclusion criteria: aged 18 years and older, admitted at least three days before collecting data (in order for them to have sufficient exposure by which the meaningfully evaluate QOC) and with stable symptoms on the day of data collection (to avoid any burden or distress for participants). Participants with documented psychiatric illness and/or severe complications were excluded.

Initially, 96 in-patients with HF were invited to participate. One potential participant declined due to discomfort in answering the Quality of Care from Patients' Perspectives (QPP) Questionnaire. Three participants were excluded before completing the QPP questionnaire as they died during the data collection period. Over nine months of the data collection period only 92 participants were finally able and eligible to be included. The final sample of 92 was sufficient to determine the factors influencing perception of QOC in persons with HF with power equal to 0.973, giving an alpha of 0.05 by G* power program. Thus, the sample used in this study was 92.

Ethical Considerations: This study was conducted with the approval of the Ramathibodi Hospital Institutional Review Board (Certificate of Approval no. MURA2015/157). Each potential participant was informed regarding the study objective, their right to withdraw, and assurance of privacy and confidentially. Those who agreed to participate were asked to sign consent form.

Instruments: The instruments for data collection were: (1)The Personal Characteristics Questionnaire; (2) The Control Preference Scale (CPS); (3) Memorial Symptom Assessment Scale-Heart Failure (MSAS-HF); and (4) The Quality of Care from Patients' Perspectives (QPP) Questionnaire.

The Personal Characteristics Questionnaire was developed by the principal investigator (PI) to gather general demographic information concerning age, gender, education, medical payments, cause of admission, underlying disease, and New York Heart Association (NYHA) classification at admission and the data collection time. Age was measured by participants' self-reported age in years. Education referred to the highest educational level obtained.

The CPS developed by Degner et al.,[27] consists of one item with five statements indicating varying degrees of preference for participation in care. Participants were asked to choose the statement which represents their preferred role for participation in care from passive =1, passive-shared = 2, collaborative=3, active-shared=4, and active participation=5. The Thai version of the CPS was translated and verified using the back-translation method by Pongthavornkamol et al.[12] and has been used in populations with cancer during hospitalization. It has high (acceptable) validity with a test-retest value of 1.0.[12] For this study, the test-retest was used to examine reliability among 10 participants. The test-retest value of CPS was 0.98.

MSAS-HF was modified from the original MSAS by Zambroski et al. for persons with HF. MSAS-HF measures the distress associated with 32 symptoms.[28] For the Thai version, the translated and back-translated process by Suwanratsamee et al. was used.[29] Participants were asked to respond "yes" or "no" regarding whether they experienced each symptom during the past week before collecting data. A positive response to any given symptom led to a request to rate the distress of the respective symptom. The level of symptom distress was rated on a 5-point Likert scale ranging from "0 = not at all" to "4 = very much". To obtain a total score, the values for symptom distress were summed and the average was calculated, whereby higher mean scores indicate greater symptom distress.[28] MSAS-HF was pilot-tested with 10 participants, and found to have internal consistency reliability with a Cronbach's alpha coefficient of 0.72 for symptom distress. For the main study, the Cronbach's alphas coefficient was 0.78.

The Short-Version QPP was developed by Wilde-Larsson and Larsson.[30] For the Thai version, the QPP was translated into Thai using the back-translation process by Pongthavornkamol et al.[12] QPP assesses patients' perceptions of QOC using 24 items. Evaluation is performed based on the patient's perception in two parts: (1) perceived reality of QOC (PR), which represents patients' perceptions of the actual care received; and (2) subjective importance of care (SI), which represents the relative importance of various aspects of care for individual patients.The items cover four dimensions: the medical-technical competence of the caregivers, the care organization's physical-technical condition, the identity-orientation approach of the caregivers, and the care organization's socio-cultural atmosphere (**Table 5**). To measure perception of QOC, perceived reality (PR) was measured using a 4-point Likert scale ranging from "1 = do not agree at all" to "4 = fully agree". For subjective importance of care (SI), a 4-point Likert scale was used ranging from "1 = of little or no importance" to "4 = of the very highest importance". The four QPP dimension scores were calculated by summing the raw scores for each dimension (PR and SI) and dividing it by the number of items in each dimension. In order to derive a score representing the overall perception of QOC, the Personal QOC Index (PQI) is calculated based on the rank order of the combination between SI and PR part. PQI for every item is then summed and the level of QOC assessed into one of seven categories ranging from "1 = inadequate quality" to "7 = excess quality".[31] For dichotomous outcome, variables reflecting high or low perception of QOC were performed on PR, according to the median: scores below or equal to the median formed a low category and scores above the median formed a high category.[32] A Cronbach's alpha coefficient was 0.94[12] for the Thai version of QPP. For this study, QPP was pilot-tested with 10 participants, obtaining Cronbach's alpha coefficients of 0.96 for PR and 0.91 for SI.

In the actual study, the Cronbach's alpha coefficients were 0.91 for PR and SI.

Data Collection: Before approaching the participants, PI collected information regarding their health status from their medical record, then potential participants according to the inclusion criteria were approached by the PI at their bedside and the objectives and nature of the study were explained. Those who were willing to participate were asked to sign the informed consent form. Participants were instructed to complete Personal Characteristics Questionnaire, CPS, and MSAS-HF by themselves after 3 days of hospitalization. Each participant completed all three instruments within 30-45 minutes, then the PI retrieved the complete questionnaires and checked to verify the completeness of data. When missing data items were identified, the PI asked the respective participant to respond. QPP questionnaires were given to the participants on the day of discharge. The PI coded the number of QPP questionnaire matching with the three instruments which were completed. The participants were instructed to complete the questionnaires by themselves and return it in a sealed envelope by mail within two weeks. After the first week the PI followed up by telephone. If the QPP questionnaire was not returned within the stipulated fortnight, follow-up strategies at OPD were employed to ensure all QPP questionnaires were returned. If missing data were identified, the PI asked the participants to respond by telephone or during the follow-up visit at OPD.

Data analysis: Descriptive statistics including frequencies, percentages, means, and standard deviations were used to describe personal characteristics, preference for participation, symptom distress, and perception of QOC. Logistic regression was used to determine factors influencing perception of QOC. Prior to logistic regression analysis, the multicolinearity was tested among five independent variables comprising age, gender, education, symptom distress, and preference for participation in care. This assumption was accepted by tolerance close to 1 and IVF not exceeding 2, indicating five independent variables were not highly correlated with one another. Univariate logistic regression analysis was used to screen the influencing of five independent variables on perception of QOC, then the variables with a p-value < 0.25[33] were included in multivariate analysis by the enter method. Age and symptom distress were coded as a continuous variable, while gender, education, and preference for participation were coded as a categorical scale.

Results

Participant characteristics: There were 92 participants in this study and 50% were male. The largest proportion of participants were primary school educated. The majority were married and Buddhists. At the time of data collection, most participants had NYHA functional class II (**Table 1**).

Table 1 Demographic and clinical characteristics of the participants (n=92)

Demographic	N	(%)	Clinical	N	(%)
Gender			**NYHA at admission**		
Male	46	50	I	-	-
Female	46	50	II	2	2.2
Age			III	43	46.7
Range = 27-87 years			IV	47	51.1
Mean = 68.2					
S.D. = 11.14					

Table 1 Demographic and clinical characteristics of the participants (n=92) (Cont.)

Demographic	N	(%)	Clinical	N	(%)
Ethnicity			**NYHA at the time for collecting data**		
Thai	91	98.9	I	8	8.7
Other	1	1.1	II	72	78.3
Marital status			III	12	13.0
Single	7	7.6	IV	-	-
Married	64	69.6	**Cause of admission**		
Widow	21	22.8	Dyspnea	65	70.7
Education attained			Chest pain	17	18.5
No study	4	4.3	Fever	7	7.6
Primary school	40	43.5	Others	3	3.3
Secondary school	17	18.5	**Co-morbid disease**		
Diploma	10	10.9	No	3	3.3
Bachelor's degree and more	21	22.8	Yes	89	96.8
Religion			**Length of stay**		
Buddhism	83	90.2	Range = 3-49 days		
Islam	6	6.5	Mean = 14.4		
Other	3	3.3	S.D. = 10.0		

Preference for participation in care: The highest proportion of persons with HF preferred a "passive-shared" role for participation in care. Only two participants preferred an active participation role (**Table 2**).

Symptom distress: Participants reported a number of symptoms ranging from 2 to 27 (mean = 10.4, SD = 4.7). The most prevalent symptom was "shortness of breath" while "difficulty when lying flat" was the most distressing symptom. Ten symptoms ranked in order of reported distress (between somewhat to very much levels) are shown in **Table 3.**

Perception of QOC: The majority of participants reported balanced high QOC whereas no participants reported inadequate QOC and excess QOC. Most of the participants perceived high reality of QOC. The overall perception of QOC and perceived reality of QOC is shown in **Table 4.**

As shown in **Table 5**, participants reported their perceptions of PR and SI in four dimensions. The dimension of medical-technical competence achieved the highest score on PR and SI. The items of physical and medical care, useful information, and opportunity to participate had lower scores of PR than SI.

Table 2 Preference for participation by patients with HF (n = 92)

Preference for participation	N (%)
Passive	12 (13)
Passive-shared	40 (43.5)
Collaborative	24 (26.1)
Active-shared	14 (15.2)
Active	2 (2.2)

Table 3 Symptoms ranked in order of distress (n = 92)

Symptom	Prevalence N (%)	Distress Mean (SD)
1.Difficulty breathing when lying flat	46 (50.0)^{7}	**3.11 (0.76)**
2. Shortness of breath	**86 (93.5)**^{1}	3.01 (0.96)
3.Waking up breathless at night	54 (58.7)^{6}	2.92 (0.92)
4. Chest pain	38 (41.3)^{8}	2.88 (0.94)
5. Other pain	23 (25.0)^{15}	2.75 (1.05)
6. Palpitations	22 (23.9)^{19}	2.55 (1.00)
7. Itching	22 (23.9)^{17}	2.47 (1.02)
8. Cough	68 (73.9)^{2}	2.46 (0.97)
9.Dizziness	23 (25.0)^{16}	2.43 (0.82)
10.Change in the way food tastes	12 (13.0)^{29}	2.40 (0.96)

$^{n =}$ Ranking of symptom distress; the first ranking of the two dimensions are emboldened

Table 4 Overall perceptions of QOC and perceived reality of QOC (n = 92)

Perception of QOC	N (%)
1. Inadequate quality	0 (0)
2. Somewhat inadequate quality	2 (2.2)
3. Balance low quality	8 (8.7)
4. Balance acceptable quality	33 (35.9)
5. Balance high quality	39 (42.4)
6. Somewhat excess quality	10 (10.9)
7. Excess quality	0 (0)
Perceived reality of QOC (range 49-96, mean 76.84, SD 10.37, median 77)	**N (%)**
High	47 51.1
Low	45 48.9

Table 5 Perceived reality care received and subjective importance on four dimension of QPP (n = 92)

Dimension and items	Perceived reality Mean (SD)	Subjective importance Mean (SD)
Medical-technical competence* (4 items)	3.39 (0.56)	3.53 (0.47)
- I received the best possible physical care	3.36 (0.74)	3.40 (0.58)
- I received the best possible medical care	3.51 (0.66)	3.59 (0.68)
- I received effective pain relief	3.36 (0.74)	3.59 (0.60)
- I received examinations and treatment within the waiting time	3.34 (0.76)	3.54 (0.60)

Table 5 Perceived reality care received and subjective importance on four dimension of QPP (n = 92) (Cont.)

Dimension and items	Perceived reality Mean (SD)	Subjective importance Mean (SD)
Physical-technical conditions* **(3 items)**	3.10 (0.56)	3.09 (0.53)
- I received food and drink that I like	2.63 (0.93)	2.58 (0.93)
- I had access to the apparatus and equipment that were necessary for my medical care	3.41 (0.60)	3.46 (0.56)
- I had a comfortable bed	3.27 (0.73)	3.25 (0.75)
Identity-orientated approach* **(12 items)**	3.21 (0.46)	3.32 (0.41)
- I received useful information on how examination and treatment would take place	3.17 (0.82)	3.46 (0.67)
- I received useful information on the results of examinations and treatments	3.27 (0.76)	3.49 (0.67)
- I received useful information on self-care	3.27 (0.65)	3.40 (0.63)
- I received useful information on which doctor was responsible for my medical care	3.15 (0.76)	3.41 (0.56)
- I received useful information on which nurses was responsible for my nursing care	3.14 (0.79)	3.15 (0.81)
- I had good opportunities to participate in the decisions applied to my medical care	3.14 (0.76)	3.30 (0.72)
- The doctors showed commitment	3.35 (0.64)	3.39 (0.65)
- The nurses and assistant nurses showed commitment and cared about me	3.17 (0.75)	3.23 (0.65)
- The doctors seemed to understand how I experienced my situation	3.25 (0.71)	3.37 (0.71)
- The nurses and assistant nurses seemed to understand how I experienced my situation	3.09 (0.74)	3.13 (0.70)
- The doctors were respectful towards me	3.32 (0.65)	3.32 (0.68)
- The nurses and assistant nurses were respectful towards me	3.18 (0.69)	3.18 (0.66)
Socio-cultural atmosphere*(5 items)	3.09 (0.50)	3.11 (0.55)
- I talked to the doctors in private when I wanted to	3.15 (0.77)	3.25 (0.74)
- I talked to the nurses in private when I wanted to	3.07 (0.78)	2.97 (0.81)
- There was a pleasant atmosphere on the ward	3.22 (0.81)	3.32 (0.69)
- My relatives and friends were treated well	3.25 (0.79)	3.09 (0.81)
- My medical care was determined by my own requests and needs	2.76 (0.84)	2.92 (0.87)

Predictors of perception of QOC in persons with HF: This study focused only on perception of QOC in terms of the actual care received (PR). Five independent variables were used to predict perception of QOC in persons with HF: preference for participation in care, symptom distress, age, gender, and education. Three variables including preference for participation in care, symptom distress, and gender were significantly associated with perception of QOC in persons with HF.

As shown in **Table 6**, multivariate analysis using the three remaining factors revealed that symptom distress and preference for participation in care were found to be significantly associated with perception of QOC. The result indicated that after controlling for the effect of other variables, the odds ratio of symptom distress was 3.281. For the factor of patients' preference for participation in care, participants who preferred a passive-shared role and collaborative role reported lower perceived score of QOC than participants who preferred a passive role for participation by 0.128 and 0.189 times. These three factors in this model accounted for 21.9% of the variance of QOC. Gender was not a significant predictor of perception of QOC in persons with HF.

Table 6 Multiple logistic regression of perception of QOC

Variables	Coefficients (B)	S.E.	Wald	p-value	Odds ratio (OR)	95% CI
Symptom distress	1.188	.496	5.733	.017	3.281	1.241-8.679
Gender						
Male		Ref				
Female	-.710	.469	2.296	.130	.492	.196-1.232
Preference for participation						
Passive		Ref	10.015	.040		
Passive-shared	-2.056	.802	6.572	.010	.128	.027-.616
Collaborative	-1.665	.846	3.875	.049	.189	.036-.993
Active-shared	-.334	.924	.131	.718	.716	.117-4.378
Active	-1.299	1.592	.666	.414	.273	.012-6.173
Constant	-.970	1.270	.583	.445	.379	

-2Log likelihood = 110.990, Nagelkerke R square = 0.219

Discussion

Most participants in this study perceived the QOC they received to be acceptable. This reflects that the setting was a tertiary care hospital with advanced technology and high levels of expertise among healthcare personnel in caring for persons with HF, consistent with previous studies conducted in tertiary care hospitals in Thailand.[12, 13] Moreover, the findings showed that the participants'rated actual care received QOC (PR part) for each dimension as "mostly to fully agree" perception of QOC, congruent with the SI part as "high to very highest importance". Consequently, the overall perceptions QOC were rated as acceptable. However, some items of actual care received QOC (in the PR part) were reported less than in the SI parts, such as "physical and medical care", "useful information", and "opportunity to participate". The results of this study indicate that although the perception of actual care received was mostly to fully agree, participants' experience of engagement in their care was less than they expected. Thus, the issues of providing care and information as well as opportunities for patient participation in their care during hospitalization should be improved.

For the factors influencing perception of QOC, symptom distress was found to be a significant predictor of QOC, inconsistent direction with previous studies[16, 22]. In the present study, the participants reported high symptom distress including difficulty breathing when lying flat, shortness of breath, and waking up breathing at night consistent with a prior study on persons with HF during hospitalization.[34] These symptoms are hallmarks of patients with HF and they are often the main reason they seek treatment.[35] All three of these distressing symptoms are serious problems and life-threatening issues in their own right for persons with HF, and healthcare professionals need more awareness and have to provide more intensive cure about such symptoms and appropriate responsive care.[36] Thus, the participants who had high symptom distress were likely to perceive higher QOC. In addition, the time for collecting data with QPP was post-discharge, while symptom distress was collected during admission. Consequently, the perception of QOC might be affected by the time of reporting relative to the experience of perception symptom distress, which was high during admission and less severe immediately after discharge.

Preference for participation in care was found to be a predictor of perception of QOC. Participants with a high preference for participation (passive-shared, collaborative) perceived QOC to be lower than for participants with a low preference for participation (passive). This finding supports that patients' preferences for participation comprise an important element in their perception of QOC. However, the direction of relationship was found to be inconsistent with a previous study.[19] This might be explained by the fact that the previous study evaluated perceived overall QOC, unlike in the current study. Moreover, most participants in the previous study highly preferred participation in care, while in our study most participants preferred a passive-shared role in terms of participation, due to the impact of reported symptoms such as shortness of breath and cough, which might decrease the functional capacity of persons with HF.[29,37] In addition, participants who had high preference for participation were more likely to actively participate in care and have higher expectations to participate in care, which influences their perception of QOC.[15] Active-shared and active role for participation were not significantly associated with perceived QOC, which could be explained by a small distribution of the participants preferring active or active-shared participation.

Gender was not a predictor of perception of QOC in persons with HF, unlike in previous studies.[20, 21] This might be due to gender being a variable inherent in the interaction between healthcare professionals and patients. Healthcare professionals may be intrinsically aware of the different characteristics and needs of male and female patients when they provide care.[38] Additionally, this study collected data from two medical units which separated male and female patients, thus the care provided to the participants might be considered intrinsically different between male and female.

Age and education were not significantly associated with perception of QOC, inconsistent with the findings of previous studies.[20, 21] This may be explained by the uneven distribution of participants within age and education groups in this study, which may have been a factor in the failure to find an association between perceptions of QOC.

Limitations

This study has some limitations. First, patients' preference for participation in care and symptom distress was collected at only one data point. Thus, we did not capture change in variables over time regarding the perception of QOC. Second, generalization of the findings is limited by the single site study and convenience sampling. Moreover, this study was also limited in the exploration of the resource structure of care organizational element, which was another core element of patients' perceived QOC.

Conclusions and Implications for Nursing Practice and Future study

This study can be used for improving QOC. The information on perceptions of QOC indicated need for quality improvements in numerous dimensions, including physical and medical care, useful information provision and opportunities for participation. Moreover, this is the first Thai study to clarify the component of patients' preference to explain the perception of QOC based on the perceptions of people with HF. Symptom distress and preference for participation were found to influence the perception of QOC. Thus, nurses must increase awareness of symptom assessment and develop HF symptom management programs for relief of symptom distress. Also, preference for participation should be assessed during hospital stay and nurses should give opportunities for participation according to a patient's preference.

For future research based on preliminary data, other factors about organizational structure and the combination of patients' preference component and organization structure component need to be examined concerning the impact on perception of QOC. Moreover, symptom distress and preference for participation can change overtime. Thus, collecting data at different time points on patients' longitudinal journeys, and repeated measures to monitor system performance over time, must be implemented to determine perceptions of QOC relative to actual health resources and care provision.

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References

1. Savarese G, Lund LH. Global public health of heart failure. Card Fail Rev. 2017;3(1):7-11.
2. Reyes EB, Ha J, Firdaus I, Ghazi AM, Phrommintikul A, Sim D, et al. Heart failure across Asia: same healthcare burden but differences in organization of care. Int J Cardiol. 2016;223:163-7.
3. Roger VL. Epidemiology of heart failure. Circ Res. 2013; 113:646-59.
4. Carter J, Ward C, Wexler D, Donelan K. The association between patient experience factors and likelihood of 30-day readmission: a prospective cohort study. BMJ Qual Saf. 2018.
5. World Health Organization. Quality of care: a process for making strategic choices in health systems. Geneva: WHO; 2006.
6. Siriwardena AN, Gillam S. Patient perspectives on quality. Qual Prim Care. 2014;22(1):11-5.
7. Donabedian A. Evaluating the quality of medical care. Milbank Q. 1966;44(3):166-206.
8. Wilde B, Starrin B, Larsson G, Larsson M. Quality of care from a patient perspective : a grounded theory study. Scand J Caring Sci. 1993;7(2):113-20.
9. Stein SM, Day M, Karia R, Hutzler L, Bosco III JA. Patients' perceptions of care are associated with quality of hospital care:a survey of 4605 hospitals. Am J Med Qual. 2015; 30(4):382-8.
10. Borghans I, Kleefstra SM, Kool RB, Westert GP. Is the length of stay in hospital correlated with patient satisfaction? Int J Qual Health Care. 2012;24(5):443-51.
11. Dy SM, Chan KS, Chang HY, Zhang A, Zhu J, Mylod D. Patient perspectives of care and process and outcome quality measures for heart failure admissions in US hospitals: how are they related in the era of public reporting? Int J Qual Health Care. 2016;28(4):522-8.
12. Pongthavornkamol K, Lekdamrongkul P, Siritanara N, Siripum S. Relationship between patients' preference for participation in care, gender, age, symptom burden, and perceived quality of care of hematological cancer patients during hospitalization. J Nurs Sci. 2016;34(2):45-57. [in Thai].
13. Kanrat K, Pongthavornkamol K, Wattanakitkrilleart D. Factors associated with perception of quality of care in cancer patients during hospitalization. Chula Med J. 2016; 60(5):523-34. [in Thai].
14. Mehica L, Gershater MA, Roijer CA. Diabetes and infected foot ulcer: a survey of patients' perceptions of care during the preoperative and postoperative periods. Eur Diabetes Nursing. 2013;10(3):91-5.
15. Hozel LP, Kriston L, Harter M. Patient preference for involvement, experienced involvement, decisional conflict, and satisfaction with physician: a structural equation model test. BMC Health Serv Res. 2013;13:231.
16. Feyer P, Kleeberg UR, Steingraber M, Gunther W, Behrens M. Frequency of side effects in outpatient cancer care and their influence on patient satisfaction-a prospective survey using the PASQOC questionnaire. Support Care Cancer. 2008;16(6):567-75.
17. Chen H, Li M, Wang J, Xue C, Ding T, Nong X, et al. Factors influencing inpatients' satisfaction with hospitalization service in public hospitals in Shanghai, People's Republic of China. Patient Prefer Adherence. 2016;10:469-77.
18. Beattie M, Murphy DJ, Atherton I, Lauder W. Instruments to measure patient experience of healthcare quality in hospitals: a systematic review. Systematic Reviews. 2015;4:97.

19. Weingart SN, Zhu J, Chiappetta L, Stuver SO, Schneider EC, Epstein AM, et al. Hospitalized patients' participation and its impact on quality of care and patient safety. J Qual Health Care. 2011;23(3):269-77.
20. Laal M. Inpatient' s perspective on nursing care; affecting factors Procedia Soc Behav Sci. 2013;84:243-7.
21. Grondahl VA, Karlsson I, Hall- Lord ML, Appelgren J, Wilde-Larsson B. Quality of care from patients' perspective: impact of the combination of person-related and external objective care conditions. J Clin Nurs. 2011;20:2540-51.
22. Koberich S, Feuchtinger J, Farin E. Factors influencing hospitalized patients' perception of individualized nursing care: a cross-sectional study. BMC Nursing. 2016; 15(14).
23. Sandsdalen T, Hoye S, Rystedt I, Grondahl VA, Hov R, Wilde-Larsson B. The relationships between the combination of person- and organization-related conditions and patients' perceptions of palliative care quality. BMC Palliat Care. 2017;16(1):17-24.
24. Forsberg A, Vikmam I, Walivaara B, Engstrom A. Patients' perceptions of quality of care during the perioperative procedure. J Perianesth Nurs. 2015;30(4):280-9.
25. Näsström L, Jaarsma T, Idvall E, Årestedt K, Strömberg A. Patient participation in patients with heart failure receiving structured home care - a prospective longitudinal study. BMC Health Serv Res. 2014;14(1):633.
26. Wilde-Larsson B. Patients' view on quality of care: age effects and identifications of patient profile. J Clin Nurs. 1999;8:693-700.
27. Degner LF, Sloan JA, Venkatesh P. The control preferences scale. Can J Nurs Res. 1997;29(3):21-43.
28. Zambroski CH, Lennie T, Chung ML, Heo S, Smoot T, Ziegler C. Use of the Memorial Symptom Assessment Scale-Heart Failure in heart failure patients. Circ. 2004; 25(4):110.
29. Suwanratsamee W, Pinyopasakul W, Charoenkitkarn V, Dumavibhat C. Symptom experiences, symptom management, and functional status in patients with heart failure. Thai Journal of Cardio-Thoracic Nursing 2013;24(1):1-16. [in Thai].
30. Wilde-Larsson B, Larsson G. Development of a short form of the Quality form the Patient' s Perspective (QPP) questionnaire J Clin Nurs. 2002;11(5):681-7.
31. ImproveIT. Revised quality index. 2015 [cited 2015]; Available from: http://www.improveit.se/kupp.
32. Wilde-Larsson B, Larsson G, Starrin B. Patients' view on quality of care: a comparison of men and women. J Nurs Manag. 1999;7:133-9.
33. Hosmer DW, Lemeshow S. Applied logistic regression. 2nd, editor: Wiley- Interscience, NY: John Wiley & Sons; 2000.
34. Alkan S, Nural N. Evaluation of symptoms and predictors in patients with heart failure in Turkey. J Hosp Palliat Nurs. 2017;19(5):404 -12.
35. Xu J, Abshire M, Han H. Decision-making among persons living with heart failure. J Cardiovasc Nurs. 2016;31(5).
36. Cowie MR, Anker SD, Cleland J, Felker GM, Filippatos G, Jaarsma T, et al. Improving care for patients with acute hart failure: before, during and after hospitaization. ESC Heart Fail. 2014; 1(2):110-45.
37. Chiaranai C, Salyer J, Best A. Self-care and quality of life in patients with heart failure. Thai J Nurs Res. 2009;13(4): 302-17.
38. FitzGerald C, Hurst S. Implicit bias in healthcare professionals: a systematic review. BMC Medical Ethics. 2017;18.

ปัจจัยทำนายการรับรู้คุณภาพการดูแลในบุคคลที่มีภาวะหัวใจล้มเหลว

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บทคัดย่อ:คุณภาพการดูแลผู้ป่วยตามมุมมองของผู้ป่วยเป็นประเด็นที่มีความสำคัญในการพัฒนาคุณภาพการบริการ อย่างไรก็ดีประเด็นนี้ยังมีการศึกษาจำกัด รวมทั้งสำหรับบุคคลที่มีภาวะหัวใจล้มเหลว การศึกษาเชิงบรรยาย ทำนาย ครั้งนี้มีวัตถุประสงค์เพื่อ อธิบายการรับรู้คุณภาพการดูแลในบุคคลที่มีภาวะหัวใจล้มเหลว และศึกษาปัจจัยทำนายการรับรู้คุณภาพการดูแลในบุคคลที่มีภาวะหัวใจล้มเหลว ได้แก่ ความต้องการมีส่วนร่วมในการดูแล ความทุกข์จากอาการ และปัจจัยส่วนบุคคล (อายุ เพศ และระดับการศึกษา) เลือกกลุ่มตัวอย่างบุคคลที่มีภาวะหัวใจล้มเหลวโดยสะดวกจำนวน 92 รายในโรงพยาบาลระดับตติยภูมิแห่งหนึ่งในกรุงเทพมหานคร ประเทศไทย เครื่องมือที่ใช้ประกอบด้วย แบบสอบถามลักษณะส่วนบุคคล แบบสอบถามความต้องการมีส่วนร่วมในการดูแล แบบประเมินอาการผู้ป่วยภาวะหัวใจล้มเหลว แบบสอบถามคุณภาพการดูแลตามการรับรู้ของผู้ป่วย

ผลการศึกษาพบว่ากลุ่มตัวอย่างรับรู้คุณภาพการดูแลอยู่ในระดับคุณภาพสูงตรงกับความต้องการ (balanced high quality of care) อาการหายใจลำบากเมื่อนอนราบเป็นอาการที่มีความทุกข์มากที่สุด ความทุกข์จากอาการและความต้องการมีส่วนร่วมในการดูแลสามารถทำนายการรับรู้คุณภาพการดูแลได้ ผลการศึกษาสามารถนำไปใช้ออกแบบโปรแกรมการจัดการความทุกข์จากอาการและส่งเสริมความต้องการมีส่วนร่วมในการดูแลของผู้ป่วยเพื่อเพิ่มการรับรู้คุณภาพการดูแลของบุคคลที่มีภาวะหัวใจล้มเหลวระหว่างรับการรักษาในโรงพยาบาล

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คำสำคัญ: ภาวะหัวใจล้มเหลว ปัจจัยส่วนบุคคล การรับรู้คุณภาพการดูแล ความต้องการมีส่วนร่วมในการดูแล ความทุกข์จากอาการ

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Editorial: A Way Forward for Palliative Care Nursing

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The growing need for palliative care has paralleled the increasing number of people with chronic conditions and ever-rising aging populations around the world. Recently, it was estimated that there are approximately 40 million people in need of palliative care every year.[1] Such increasing demand makes it challenging for health care professionals, including nurses, to serve patients with life-threatening and life-limiting conditions, as well as their families and the health care system as a whole.

In this editorial review, I would like to focus on two main points. Firstly, the key milestones of global efforts for palliative care development will be described, then a way forward for palliative care nursing to support the palliative care development will be highlighted.

Global palliative care movement

Palliative care was first advocated as a universal human right in the 1990s.[2] The right to palliative care focuses on the right to health and freedom from suffering and ill treatment. Since then, the need for palliative care development has been echoed at international and national levels. In 2007, the WHO proposed a public health model that would enable the development and integration of palliative care into a country's health care system. This consists of a combination of policy development, medication availability, public and professional education, and implementation of palliative care at all levels of care.[3] Later on, palliative care was addressed in the WHO global action plan for the prevention and control of NCDs 2013-2020[4] and in the 2014 World Health Assembly (WHA) resolution 67.19[5] as an ethical responsibility of the health system and an essential component of comprehensive care throughout one's life span.

Despite an increasing awareness of and growing advocacy efforts for palliative care development worldwide, accessibility to quality palliative care remains poor for many people, particularly those who live in low- and middle-income countries. A disparity in the stage of palliative care development exists across the world, ranging from no known palliative care activity (32% of 234 countries) to an advanced integration of palliative care in the mainstream health care system (8.6% of 234 countries).[6] Highlighting this variation, a report on the Quality of Death Index (QDI), which reflects the availability of palliative care in 80 countries, described consistent results. The high-income countries were in the top ten positions of the highest QDI. On the contrary, the QDI in both low- and middle-income countries was lower than 60 marks.[7] Recently, the Lancet Commission on Global Access to Palliative Care and Pain Relief reported that 35.5 people living with life-threatening or life-limiting health conditions experience serious health-related suffering (SHS), and the majority of these people live in low-income and middle-income countries where there is no or little access to pain medications or palliative care.[8]

In order to overcome the issues related to accessibility and equality, the WHO has released a guide on integrating palliative care into primary care. The primary health care setting is considered to be the first place where people can have access to palliative care from the early course of the disease. This practical guide will be useful to planners, implementers and managers to set up the primary palliative care in their health system.[9] The successful integration of palliative care into the primary health care results in the early identification of patients eligible for palliative care,[10] the decline in emergency visits and hospital admissions, and home deaths.[11] Recently, the integration of palliative care into the primary health care was endorsed in the 2018 Astana Declaration at the global conference on primary health care in October.[12]

A way forward for palliative care nursing

Nurses, the largest group of the health workforce, are acknowledged as the backbone of the healthcare system. We can contribute greatly to not only palliative care clients but also the health care system at large. We provide care and support for both patients and their families throughout the illness trajectory. We are always there for them when they are healthy, sick, in deteriorating health, and dying. We are by the side of family members also during the bereavement period. At the public health level, we who work at the frontline of primary care settings orchestrate community-based palliative care by working with communities to increase public awareness on the topic of death and dying and creating compassionate communities that are able to support dying persons at home. According to the International Council of Nurses,[13] palliative care is a nurse-driven approach, which requires complex decision-making and leadership skills. Nurses collaborate with various stakeholders such as patients, families, health and social care professionals as well as managers, policy makers and planners to advance palliative care.

In an era of growing needs for palliative care, we, as nurses, are at the pivotal position to support a global movement for the advancement of palliative care for all. Notwithstanding the remarkable contributions of nurses to the health care system, several challenges lie in wait. Appropriate responsive strategies to overcome these challenges would result in a flourish for palliative care nursing. Three main strategic recommendations toward that end are addressed here.

Investing in palliative care nursing education

Palliative care education is recommended as one of the four most important public health strategies for the development of palliative care worldwide. WHO recommends that nurses working in primary health care should possess basic palliative care nursing competences and be able to provide primary palliative care to their patients.[9] However, previous studies have revealed that nurses are not well-prepared for palliative care.[14,15] Often, nurses report that they feel incompetent and reluctant to care for dying patients and their families, particularly as it regards the aspect of care related to communication. In order to enhance the quality of palliative nursing care, it is essential for nurses to acquire knowledge and skills on these matters. Recently, a call to action with the aim of integrating palliative care content into the undergraduate nursing curricula and preparing the next generation of nurses to care competently for patients at the end-of-life stage has been echoed.[16-18]

In addition, professional development programs on palliative care via short-course training or workshops are essential to the enhancement of knowledge and skills required for the advancement of palliative care practices, ensuring patients received up-to-date nursing care. Educational interventions with innovative approaches in order to promote accessibility to palliative care as well as ongoing education and training are also recommended.[19-22] Following this strategy, specialist nurses in palliative care can navigate caring for patients with complex palliative care needs while coaching community nurses to provide care for dying patients at home.

Strengthening evidence-based practices in palliative care nursing

Palliative care nursing reflects the quality of palliative nursing care service.[23] As evidence-based practices have promoted better patient care, palliative care delivery should also be incorporated based on evidence. Despite the growing research on palliative care interventions, high quality evidence is limited,[24] particularly in low-resource settings.[25] Sound intervention research studies are needed to advance the knowledge development regarding palliative care nursing. In addition, it is apparent that assessing palliative nursing care is challenging due to a lack of objective instruments[23] and the complexity of measurements concerning the quality of palliative care.[26] Developing tools to measure the quality palliative nursing care is also very much needed. The patient-reported outcome measurements must be sensitive to patient complexity. Mixed methods can be used to comprehensively capture the patients' perspectives related to being cared for both subjectively and objectively. The results from patient-reported outcome reports can help us to identify areas for improvement in palliative nursing care.

Expanding roles of nurses in primary health care

Nurses play crucial roles in primary health care. The call to integrate palliative care into the primary health care has presented us with the opportunity to take actions to lead the care delivery in communities.[27] Nevertheless, palliative care at the primary health care level is challenging. Several studies have identified barriers to palliative home care like the complexity of chronic conditions, primary health care providers' incompetences, poor communication and coordination of care, limited accessibility to equipment, services, and medications, and time constraints related to GPs.[28-31] These barriers led to fragmented care and, consequently, result in unmet needs among both patients and caregivers.[32]

To bridge the gap in the fragmentation of the care system and to promote a seamless care service able to respond to the complex care needs of patients with chronic illness and their families, the role of nurses at primary care settings has to be expanded and enhanced. The nurse as a navigator is another role that fits the primary health care approach.[33] The nurse navigator model has been implemented in countries like USA, Canada and Australia. This model has had positive impacts on patient outcomes and has improved the care process.[34-36] In addition, several nursing scholars have proposed that, in the future, nurses delivering primary care will focus more on chronic disease management.[27, 37] Their responsibilities will include managing patients with chronic conditions, leading complex care management teams to improve the quality of care, and coordinating care between primary care settings and the other levels of care.[38] This current trend in enhancing the role of nursing reflects the need to improve the preparation of nurses working in primary care settings. Hence, new curricula and practices that will adequately equip the future nurses to serve as leaders in the organization of the primary care practice as well as play chief roles within inter-professional teams is recommended.[27]

Conclusion

Nurses play a profound role in palliative care. The high demands for palliative care in the future call for us to take proactive steps in order to affect the development of palliative care. Building the necessary capacities among future nurses by means of palliative nursing education, tailoring rigorous research studies to expand our knowledge regarding palliative care as well as incorporating evidence-based practices in nursing care, and expanding the role of nurses in the primary health care setting are recommended to advance palliative care nursing for all.

References

1. World Health Organization. Palliative care. Geneva: World Health Organization; 2018 [cited 2018 Dec 4]. Available from: https://www.who.int/news-room/fact-sheets/detail/palliative-care.
2. Ezer T, Lohman D, de Luca GB. Palliative care and human rights: a decade of evolution in standards. J Pain Symptom Manage. 2018;55(2S):S163-9.
3. Stjernswa¨rd J, Foley KM, Ferris FD. The public health strategy for palliative care. J Pain Symptom Manage. 2007;33(5):486-93.
4. World Health Organization. Global action plan for the prevention and control of noncommunicable disease 2013 – 2020. Geneva, Switzerland: the WHO Document Production Services; 2013 [cited 2018 Dec 4]. Available from: http://apps.who.int/iris/bitstream/handle/10665/94384/9789241506236_eng.pdf;jsessionid=07258A055E8B06E281A89F6A91314DC8?sequence=1.
5. World Health Organization. Strengthening of palliative care as a component of comprehensive care throughout the life course Geneva, Switzerland 2014 [cited 2018 Dec 4]. Available from: http://apps.who.int/medicinedocs/documents/s21454en/s21454en.pdf.
6. Connor SR, Bermedo MCS, editors. Global atlas of palliative care at the end of life. London: Worldwide Hospice Palliative Care Alliance; 2014.
7. The Economist Intelligence Unit. The 2015 Quality of Death Index Ranking palliative care across the world 2015 [cited 2018 Dec 4]. Available from: https://www.eiuperspectives.economist.com/healthcare/2015-quality-death-index.
8. Knaul FM, Farmer PE, Krakauer EL, Lima LD, Bhadelia A, Kwete XJ, et al. Alleviating the access abyss in palliative care and pain relief—an imperative of universal health coverage: the Lancet Commission report. Lancet Oncol. 2018;391(10128):1391-454.
9. World Health Organization. Integrating palliative care and symptom relief into primary health care A WHO guide for planner, implementers, and managers. Geneva, Switzerland: WHO publications; 2018.
10. Llobera J, Sans N, Ruiz A, Llagostera M, Serratusell E, Serrano C, et al. Strengthening primary health care teams with palliative care leaders: protocol for a cluster randomized clinical trial. BMC Palliat Care. 2017;17(1):4.
11. Spilsbury K, Rosenwax L, Arendts G, Semmens JB. The impact of community-based palliative care on acute hospital use in the last year of life is modified by time to death, age and underlying cause of death. A populationbased retrospective cohort study. PLoS One. 2017;12(8):e0185275.
12. World Health Organization. Declaration of Astana 2018 [cited 2018 Dec 10]. Available from: https://www.who.int/docs/default-source/primary-health/declaration/gcphc-declaration.pdf.
13. International Council of Nurses. Nursing matters palliative care. Geneva: International Council of Nurses; 2009 [cited 2018 Nov 28]. Available from: http://www.icn.ch/images/stories/documents/publications/fact_sheets/8b_FS-Palliative_Care.pdf.
14. Pesut B, Greig M. Resources for educating, training, and mentoring nurses and unregulated nursing care providers in palliative care: a review and expert consultation. J Palliat Med. 2017;20(S1):S50-6.
15. Gillan PC, van der Riet PC, Jeong S. End of life care education, past and present: a review of the literature. Nurse Educ Today. 2014;34(3):331-42.
16. O'Connor B. CARES: Competencies and recommendations for educating undergraduate nursing students preparing nurses to care for the aeriously ill and their families. J Prof Nurs. 2016;32(2):78-84.
17. Ferrell B, Malloy P, Mazanec P, Virani R. CARES: AACN's New competencies and recommendations for educating undergraduate nursing students to improve palliative care. J Prof Nurs. 2016;32(5):327-33.
18. Ferrell B. Preparing the next generation of nurses. J Hospice Palliat Nurs. 2016;18(1):1-2.
19. Carr CH, Musselman E. Hospice & palliative care education for advanced practice registered nurses: are more programs needed? J Fam Med. 2016;3(2):1053.
20. Bakitas MA, Elk R, Astin M, Ceronsky L, Clifford KN, Dionne-Odom JN, et al. Systematic review of palliative care in the rural setting. Cancer Control. 2015;22(4):450-64.

21. Bassah N, Seymour J, Cox K. A modified systematic review of research evidence about education for pre-registration nurses in palliative care. BMC Palliat Care. 2014;13:56.

22. Phillips JL, Piza M, Ingham J. Continuing professional development programmes for rural nurses involved in palliative care delivery: an integrative review. Nurse Educ Today. 2012;32(4):385-92.

23. Kirkpatrick AJ, Cantrell MA, Smeltzer SC. A concept analysis of palliative care nursing advancing nursing theory. Adv Nurs Sci. 2017;40(4):356-69.

24. Henoch I, Carlander I, Holm M, James I, Sarenmalm EK, Hagelin CL, et al. Palliative care research - a systematic review of foci, designs and methods of research conducted in Sweden between 2007 and 2012. Scand J Caring Sci. 2016;30:5-25.

25. Potts M, Cartmell KB, Nemeth L, Bhattacharjee G, Qanungo S. A systematic review of palliative care intervention outcomes and outcome measures in low-resource countries. J Pain Symptom Manag. 2018;55(5):1382-97.

26. Dudgeon D. The impact of measuring Patient-Reported Outcome Measures on quality of and access to palliative care. J Palliat Med. 2017;20(S1):S76-80.

27. Smolowitz J, Speakman E, Wojnar D, Whelan E-M, Ulrich S, Hayes C, et al. Role of the registered nurse in primary health care: meeting health care needs in the 21st century. Nurs Outlook. 2015;63(2):130-6.

28. Saito DYT, Zoboli ELCP. Palliative care and primary health care: scoping review. Rev bioét. 2015;23:591-605.

29. Rubin G, Berendsen A, Crawford SM, Dommett R, Earle C, Emery J, et al. The expanding role of primary care in cancer control. Lancet Oncol. 2015;16(12):1231-72.

30. de Brito M, Gomes B. Non-cancer palliative care in the community needs greater interprofessional collaboration to maintain coordinated care and manage uncertainty. Evid Based Nurs. 2015;18(3):79.

31. Kaasalainen S, Brazil K, Wilson DM, Willison K, Marshall D, Taniguchi A, et al. Palliative care nursing in rural and urban community settings: a comparative analysis. Int J Palliat Nurs. 2011;17(7):344-52.

32. Ventura AD, Burney S, Brooker J, Fletcher J, Ricciardelli L. Home-based palliative care: a systematic literature review of the self-reported unmet needs of patients and carers. Palliat Med. 2014;28(5):391-402.

33. McMurray A, Cooper H. The nurse navigator: an evolving model of care. Collegian 2017;24(2):205-12.

34. Pautasso FF, Zelmanowicz AdM, Flores CD, Caregnato RCA. Role of the nurse navigator: integrative review. Rev. Gaúcha Enferm. [Internet]. 2018 [cited 2019 Jan 06]; 39: e2017-0102. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1983-14472018000100503&lng=en. Epub July 23, 2018. http://dx.doi.org/10.1590/1983-1447.2018.2017-0102.

35. McBrien KA, Ivers N, Barnieh L, Bailey JJ, Lorenzetti DL, Nicholas D, et al. Patient navigators for people with chronic disease: a systematic review. PLoS One [Internet]. 2018 [cited 2018 Dec 1]; 13(2):[e0191980 p.]. Available from: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0191980.

36. Carter N, Valaitis RK, Lam A, Feather J, Nicholl J, Cleghorn L. Navigation delivery models and roles of navigators in primary care: a scoping literature review. BMC Health Services Research. 2018;18:96.

37. Bauer L, Bodenheimer T. Expanded roles of registered nurses in primary care delivery of the future. Nurs Outlook. 2017;65(5):624-32.

38. Lamb G, Newhouse R, Beverly C, Cropley S, Kurtzman E, Rantz M, et al. Policy agenda for nurse-led care coordination. Nurs Outlook. 2015;63(4):521-30.

Thai Community Perspectives on Suburban Smoke–free Homes: Qualitative Findings from a Mixed Method Study

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Abstract: A smoke-free home is defined as one where people are not allowed to smoke anywhere inside the home. Smoking inside the home leads to second-hand smoke for all household members, a health hazard that needs to be addressed. This study explored the perspectives of community members toward a smoke-free home in a suburb of Bangkok metropolitan area, Thailand. This paper describes the qualitative descriptive phase of a sequential mixed method study which employed four focus groups interviews with 29 key informants, including community committee members, smokers' family members, and current smokers. Focus group guidelines centred on understanding second-hand smoke and its effects on family health, how to ban smoking inside homes, and how communities get involved in promoting smoke-free homes.

Content analysis was applied for data analysis and the findings on community perspectives on smoke-free home had three categories: 1) negative attitudes toward second-hand smoke inside homes; 2) effect of second-hand smoke on health problems; and 3) feasibility of smoke-free homes. Participants believed it was possible to develop a smoke-free home by setting a community agenda that required participation and coordination among community members, family members, and current smokers.This should entail strengthening family negotiations, setting smoking ban rules, and providing smoking areas outside homes, as well as supporting current smokers to quit. Public health nurses have a role to play in promoting smoke-free homes by their advocating, encouraging, and empowering smokers in reducing or quitting their smoking, as well as providing guidance to their families. In turn this helps to strengthen community action to prevent second-hand smoking and smoking reduction.

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Introduction

Second–hand smoke (SHS) has the highest prevalence at home[1,2] and significantly increases tobacco–related illness.[3] Moreover, smokers with chronically high nicotine levels have a greater physical reaction to SHS exposure which makes them feel more stressed.[4] Smoking inside homes is the

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indicator to assess SHS exposure.[5] Evidence shows that children in contact with SHS affects their long term survival and development.[6] Therefore, SHS prevention and control in households are critically important.

Most people agree on anti-smoking legislation in public areas and are concerned that SHS is serious threat to health.[7] Social reactions when smokers smoke outside the house or in a public place, includes them being met with negative nonverbal reactions, such as people covering their noses and mouths.[8] They may also receive verbal abuse from members of the public who do not like smoking. Not surprisingly, a significant number of smokers (45.5%) agree more than non-smokers that everyone has the right to smoke in public places.[7] Social reactions to smokers may push the majority of smokers to smoke in their homes. Smoking cigarette reduces anxiety, relaxing, calm down, and makes smokers feel good.[9] About one-half of any tobacco users report having smoke-free rules in a private setting.[10] In low-income countries like Bangladesh, it has been found that a significant proportion of second-hand smoking occurs due to smoking being allowed at home.[11] Moreover, family members especially wives, are often powerless to discuss this issue with a smoker,[12] so in many cases family members alone may not be able to solve the problem of SHS in the home.

The home where smoking is not allowed is called a smoke-free home (SFH).[10, 13, 14] A SFH is the goal for decreasing SHS in the home and needs the cooperation and concerted efforts of family and community involvement. Studies have found that there are varying approaches for the SFH such as determining smoke-free rules in the home,[13,15] raising awareness of community people and family,[16] and educating people to establish a smoke-free policy.[1,12] The core essence of tobacco control implementation especially regarding SFH requires collaboration with people, the public health community, health care practitioners, and other organizations at multi-levels.[11, 13, 16, 17]

Monitoring tobacco control policies is required for better planning and implementation of necessary public health intervention. The Royal Thai government has enacted the Tobacco Control Act, combined with the Health Care Act for non-smokers which indicated that smoking decreased over the period 2004-2017 (B.E.2547-2560).[18] However, the Thai laws cannot cover smoking at home so the prevalence of this continues.[19, 20] The concept of a SFH is new for many in Thailand communities and previous studies have usually focused on helping individuals or specific groups of the smokers about smoking cessation.[14, 21] The knowledge about community views on SFH and the linkage between this and SHS in the family context is limited, especially in Thailand.

Aim

To explore community perspectives on SFH in a suburban area of Thailand.

Theoretical framework

Community participation is a principle of primary health care which can improve health outcomes, equity, service access, relevance, acceptability, quality and responsiveness.[22] Evidence for applying SFH includes the concept of participation, a commitment to democratic principles, and has been used for practice and research[23] but participation by community members is not easy to achieve.[24] Community participation should develop and engage in the beginning to the end of the process. Therefore, involvement by healthcare provider with community partnerships is a key for success for sustainability.[25]

Community needs assessment, which is the first step in community development, is very important. This is a process to identify and prioritize opportunities for collaborative action in the community.[26] The evidence recommends that to achieve anti-tobacco strategies requires strengthening of legislation and reducing social acceptability of smoking.[27] All of the stakeholders should get involved as health partners combined with the coalition strategies by relying on data-based and ongoing assessment in which sustainability is built.[28] A suburban community is a place where a large number of people come together for a special purpose that lacks the features of a city.[29] Community-engaged approaches are employed including establishing co-learning opportunities, participatory procedures for community-academic involvement, community and clinical capacity building[30] which is an input to guide the next implementation. Therefore, community understanding and realization are the first steps for a community to solve its problems.

Methods

Design

This paper presents findings of the descriptive qualitative first phase of a larger sequential mixed-method study.

Sample and setting

The setting was a suburban area of Bangkok Metropolitan, located in the north of Bangkok, Thailand. The prevalence of smokers in population aged 15 years and over was 1,135 people.[31] This community was selected based on its proximity to the suburban area, its active community leaders group which expressed interest in working with the research team, and the community-based intervention activities targeting SHS and SFH issues had not been implemented before at the time of project initiation.

Participants comprised community committee members, the families of current smokesr, and smokers as follows: Community committee members (8 people) were recruited by the head of a community committee, a village headman, 3 representatives of community committee members, a head of the healthcare volunteers, and 2 representatives of the healthcare volunteers. Participants' recruitment was guided by inclusion criteria of residency in the community for at least 6 months, and working in their position in the community no less than 2 years. Community committee members were representative of people in the community, working with different kinds of community policy, and activities in the community.

There were 15 family members of current smokers who were divided into 2 groups (7-8 people/group). All were recruited from family members who live with a current smoker and were exposed to SHS in the homes and were invited to join the study by the community committee.

To ensure diverse perspectives on SHS exposure inside a home, the six current smokers who smoked at home were included but had no serious health problems, and no substance use co-mobidity.

Ethical considerations

This study was approved by the Ethical Review Committee for Human Research, Faculty of Public Health, Mahidol University (COA. No. MUPH 2016-114). All participants took part voluntarily after being informed about the study verbally, and signed a consent form. Participants were free to withdraw at any time from the study. All information was kept strictly confidential and anonymous in the publication of their responses.

Data collection

Focus groups interview were utilized for data collection from December 2016 to January 2017 with one group of community committee members, two groups of current smokers' family members, and one group of current smokers. All participants gave permission for note-taking and audio-recording of interviews. The focus group guidelines were based on attitudes toward smoking inside the home, its effects on health, and the feasibility for developing SFH in communities. All questions were reviewed by five experts and these totaled 10 items (Table 1). Interviews were approximately 40-60 minutes in length per group and were stopped when no new categories emerged and all question were completed, reaching consensus on the meaning and importance of analytic categories. A complete review of categories continued until data saturation.

Table 1 Topic guide for focus group interviews.

Objective	Probing Questions
To explore the participants' opinions about SHS and its effects.	What is second-hand smoke?
	How does second-hand smoke affect people in the home?
	How do you think of people who smoke inside their home?
To find methods based on participants' viewpoint about feasibility, and develop smoke-free home interventions.	What does a smoke-free home look like?
	How can people prevent exposure to cigarette smoke in the home?
	How is the community and family members work together to create smoke-free homes in the community? Which local organizations can help to develop smoke-free homes in our community.
	In the past, what strategy did you prefer to avoid second-hand smoke? What do you think community committee or your family can do to help you to quit smoking? (current smokers only) In which area of the home could you stop smoking? Why? (current smokers only)

Data analysis

Researchers reviewed and checked the transcripts against the audio-recordings for accuracy. Content analysis steps were implemented as follows: transcripts read line by line, extracting the underlying content of the texts; coding the meaning units; clustering similar words, phrases, and concepts in relation to the content of each text; and compiling categories out of those subcategories. Description and interpretation were completed alongside reading and rereading.

Trustworthiness

Criteria of credibility, confirmability, dependability, and transferability accumulatively contributed to trustworthiness.[32] Engagement in establishing rapport and spending time immersed in community members' activities help to establish credibility. The interviewer avoided using ideas and experiences to lead or direct the participants to express their experiences and feelings. The reflexive data and community committee members checking methods were carefully applied to make the study process with confirmability. Dependability was enhanced through debriefing data collection and analysis with the advisory committee and sharing emerging ideas, codes, and interpretations. The reflective notes and narrative analysis were carefully applied not only to ensure that the study process was transparent and consistent but also verify key findings with supporting data. The thick description of participants' perspectives helped to assist validity of findings.

Findings

The 29 participants' characteristics were divided into three sub-groups: 1) community committee members (CC) (n=8) (male =4, female=4); 2) smokers' family members (FM) (n=15) (male =7, female=8); and 3) current smokers (SM) (n=6) (male =4, female=2). Females (n=14) and males (n=15) participated in this study. Most participants were married and age range between 18-85 years old, with the average age of 56.54 years.

The perspectives of communities are presented below in three categories: negative attitudes toward SHS inside home; the effects of SHS on health problems; and feasibility of SFH (Table 2).

Table 2 Categories and sub-categories regarding community members' perspectives on smoke-free home.

Categories	Sub-categories
Negative attitudes toward SHS inside the home	- Hate smoking inside home - Current smokers have some problems - Bad habit and selfish - Loss of money
Effect of SHS includes health problems	- Smoking causes lung diseases - Respiratory illnesses - Smoking creates diseases - Cigarette smoking like a drug addict
Feasibility of smoke-free home.	- Agree with developing the smoke-free home - Community agenda - Health education - Home smoking-ban rules - Negotiate with smokers - Smoking in somewhere outside the home - Support smokers to quit smoking - Participation of the community with a local coordination

SHS=second-hand smoke

Category 1: Negative Attitudes Toward Second-hand Smoke Inside Home

Most of participants disliked cigarette smoke because of its adverse smell. However, they believed that current smokers may be experiencing some problems or that smoking relieves stress. Participants felt sympathetic toward smokers because of a law enforcement ban on smoking in public places and social disapproval.

> *...smelly...* (CC4)
>
> *I hate smoking. ...feel annoyed...* (FM4, 11, 13)
>
> *Smokers are not bad; they smoke because they may have some problems.* (CC2, 4, 5)
>
> *When I felt more stress, then I smoked more. ...it was my habit.* (SM5, 6)
>
> *I think that a smoker is blamed too much by society.* (FM12)
>
> *I sympathize with him.* (CC4)

Some family members claimed smokers were selfish. They were also fearful that smokers may commit violence after drinking alcohol. Also, smoking was claimed to be a waste of money.

> *I am so sad that he does not love his family.* (FM3, 11)
>
> *He is selfish.* (FM11)
>
> *He is smoking and drinking alcohol. He might hurt me.* (FM10, 12)
>
> *Smoking loses your money, ...he is burning money...* (FM8, 11)

When smoking outside the home, the smoker is often criticized by the society, therefore, the home provides a safe place for smoking. Smoking in restrooms was found to be a typical habit. Some smokers revealed that family members never discussed or requested them to stop smoking in the home, so they carried on smoking indoors. Comments in this category included:

> *Smoker was blamed by society...* (FM12)
>
> *Smoking at home is safe. It is my home.* (SM4)
>
> *I would love to smoke in the toilet... it was my habit.* (SM5, 6)
>
> *No one complained to me...so I carried on smoking at home...* (SM2, 5)

Category 2: Effect of Second-hand Smoke on Health Problems

In regard to the effects of SHS, most participants stated that cigarette smoking affected their health. Smoking causes lung diseases, allergies, coughing, uncomfortable breathing, and respiratory illnesses. Smoking can also cause carcinoma. SHS may worsen the health of patients with chronic diseases and adversely affect the general health of smokers. Interestingly, smoking cigarettes was seen as a significant pathway to illegal drugs. SHS involves the same health risks as smoking and was perceived as perhaps being more harmful to health than actually smoking.

> *It is bad for health.* (FM1)
>
> *It is worse for people nearby than for the smoker.* (FM12)
>
> *...difficult breathing and nasal congestion. I have a sore throat. ...smoking creates diseases...* (FM12)
>
> *A cigarette smoking causes me to cough.* (CC3)
>
> *I had rhinitis. It causes complication, high blood pressure, and cholesterol.* (CC4)
>
> *Smoke causes irritated eyes and chest pain. There is both cigarette smoking and sie-koon-roi (a substance that is composed of illegal ingredients which are kratom leaf (mitragynine), energy drink, anti-tussive with codeine, and soft drink), like a drug addict)* (CC7)
>
> *I think smoking creates more diseases.* (CC8)
>
> *It causes carcinoma.* (SM2)

Category 3: Feasibility of Smoke-free Homes

Participants revealed that maintaining a SFH was feasible in communities and gave suggestions as to how this could be implemented. The community committee suggested that a SFH initiative should be initiated through the coordination among related organizations.

> *It's good.* (FM7-8,10, 13)
>
> *I agree to develop smoke-free homes in this community.* (CC4)
>
> *We should help each other. We are the community committee and we wish to volunteer.* (CC3, 7)
>
> *We are in contact with secondhand smoke every day. We advised to stop smoking at home. We encourage them to keep going (stop smoking).* (CC3-5)
>
> *Everyone in the system should be involved in this tobacco-free home...* (CC5-6)

Implementation actions described by the participants is summarised below.

1) Community actions. Community committee members concluded that SFH should be placed on the community agenda and worked on together with academic support from related organizations such as local hospitals, public health organizations, and social agencies in a community context to create a sustainable solution to deal with the problem.

> *The agencies and related organizations should be responsible for it and be involved.* (FM7, 11)
>
> *For developing smoke-free homes, it might take time. For example, in a big community event, set the campaign of smoke-free homes. At various meetings such as community committee meeting or wedding parties, advise to stop smoking at home and encourage smokers to keep quit smoking.* (CC3, 8)

2) Regarding the reinforcing of negotiation skills for family members, the results showed that non-smoking family members were wives who did not feel confident to tell their husband, neighbor, or guest to stop smoking inside their home.

> *I'm afraid, he might get angry, and he would throw the knife at me.* (FM3)
>
> *We could not prohibit visitors to stop smoking in our houses.* (FM7, FM11)
>
> *It is my business to tell him to stop smoking, it is his health. Every time we fight. He always abuses me.* (FM10)

When talking with smokers one must consider the appropriate time and exhibit calm manners were important during negotiations. Raising an individual smoker's awareness was important, but people also need to beware of unfavorable reactions.

> *It must be discussed. We should speak directly, while we also should understand his emotional state, use the right time and use pleasant words, ...ask him to smoke somewhere else, and not to smoke near me ...It needs enough time to present a sincere request for the smoker to quit...* (CC8)

The participants described a SFH and applying smoke-free rules by placing no smoking signs, stickers, and posters in the household as a reminder to the smokers. Most of them said that smoking should be prohibited in the home. Some members stated that smoking should not be allowed in some places.

> *He should smoke outside.* (FM4, FM7-8, 12-14)
>
> *I will smoke outside.* (SM4, SM6)
>
> *We should show the smoke-free home poster inside the house. There should be signs to show where there is a smoking ban.* (CC5)
>
> *I think it should be a total smoking ban inside homes.* (CC1, CC5)
>
> *...also, do not smoke in the restroom...* (FM10)

3) Participation of community and related organizations: The community committee members concluded that they had to become involved to help family members create a SFH and also support smokers who needed to quit smoking. The committee anticipated inviting officers of sub-district health promoting hospital to advise them on methods to quit smoking. The community healthcare volunteers and other volunteers are further important agents for community mobilization.

> *We should work with a healthcare professional in a sub-district health promoting hospital. They would help current smokers to stop smoking.* (CC6-7)

Participants suggested endorsing community participation and self-empowerment, which represented the people's sense of concern and belonging. Trust and unity were important keys to success:

> *We should have self-empowerment. Let's help each other like at King Rama 9's funeral. We will find the time and persuade the villagers to come and share in all the activities together.* (CC4, CC 7-8)

Quit smoking support: Some family members maintained that those who smoked for a long time would find it most difficult to quit and often times had no intention to quit. Family members felt discouraged. Health professionals should help current smokers to quit smoking.

> *He has been smoking for a long time. We may have to talk to him until we all die.* (FM10)
>
> *He has no intention to quit. A health care professional in the hospital should help.* (CC7)

In summary, most participants disliked smoking inside home and they were concerned about SHS exposure. It was considered feasible for smoking-bans at homes in this community. Participants described how to develop SFH and set an agenda for this, participate with community members and local organizations, practice negotiation skills with current smokers, stop smoking at home, and persuade current smokers to quit smoking.

Discussion

To the best of our knowledge, this is the first exploratory study to examine SFH among community members, current smokers and family members in suburban Thailand. The qualitative descriptive method enhanced our understanding of suburban SFH within Thai community perspectives. There is a strong prospect that smoking behaviors inside the home present negative attitudes on cigarette smoke consistent with prior research that noted unfavorable attitudes toward smoking, cigarette odor,[8] and when smokers smoke in front of children.[33] Cigarette smoking is a bad habit.[12] Hence, probably most non-smokers are concerned with the effect of SHS on their health and perceive this as very harmful,[8, 34] but Saw et al.[33] stated a conflicting view that smokers and non-smokers are concerned about the harmful effects on the health of the smoker, not the household members impacted by SHS exposure.[33] This suggests that SHS should be more emphasized by all families and community members.

Smoking inside home occurs because of several possible reasons. These may be that people in a public area have a negative reaction to smokers, and smoking in public does not receive favourable views.[8] Our study has found that community members sympathize with their family members who blamed the smokers. The home is a private setting and smokers need to relax and feel safe to smoke, as shown in a previous study of smokers reaching for cigarettes while under stress, and cigarette smoking is pleasurable.[9, 35] This may be explained by the fact that nicotine addiction is analogous to other pharmacological addictions (also referred to as brain rewards).[36]

Even though nearly all family members shared a concern for the smoker's health and wanted them to quit smoking, they allowed smoking and kept quiet because they did not want family conflict, given that Thai people's habits generally are very cautious not to create conflict in the household. Family conflict in the home about smoking will help to stop smoking cessation.[8] For this reason, family members do not talk about the danger of smoking.[9] Nevertheless, a smoker does not want to be blamed by family members who should provide support, and speaking reasonably as scolding is not good for smokers.[8] Therefore, there needs to be encouragement of negotiations between family members as one tactic for treating the smoker with sincere respect and in a calm manner.

People agree on developing SFH in communities using a few strategies such as raising awareness about the harms of SHS with the strongest comment for the family's health, and especially that of children.[12] Previous studies commented that concern about the harm of smoking is also a predictor of cessation.[37] This study suggests that to stop smoking at home should involve talking with and giving cautions to inform smokers that smoking is dangerous as well as practicing to speak intelligently about this.

Smoke-free homes implementation should begin with the coordination of local networks and family participation.[16] Sharing information about the SHS issue to people could increase the number of SFH.[16] The use of SFH signs acts as a passive yet visible enforcement to discourage smoking in the home. Similarly, an intervention with a no-smoking sign is needed to eliminate SHS at home, including a complete agreement to ban smoking at home.[12]

Community members commented on participation and self-empowerment which is derived from people's sense of concern and belonging. Similarly, the involvement of community leaders, a healthcare profession, and people in the community is proposed for enhancing SFH.[16] These strategies illustrate that awareness of the duties in a role of community members through the interaction between public health personal integrated with the highest level of participation. This can affect their thoughts, beliefs, values, and change their behaviour toward better health.

Therefore, community participation is an important strategy for maintaining a SFH and reducing SHS. It was considered possible by the participants to implement SFH in this suburban area with the involvement of the community members.

Limitation

This study is limited as it was conducted with community members in a suburban area. Thus, the findings may not reflect the perspective of city dwellers or other communities.

Conclusion and Implications for Nursing Practice

Our findings provide evidence of community members' willingness to establish SFH with a community agenda and to implement this through the participation of committees, family members, and smokers. To strengthen community members against the burden of diseases and premature death, public health nurses should provide support, advocate, and empower people. Also, the public health nurse is a health partner who works in collaboration with community leaders for mobilizing community action, protecting members from SHS and implementing SFH in the future.

As the World Health Organization states, understanding patterns and trends in tobacco use and exposure to tobacco smoke helps policy-makers design stronger, more targeted tobacco control policies.[5] This can be applied by policy-makers in government and nongovernmental organizations to plan second-hand smoking control in the household at the communities. Thailand National Tobacco Control has applied for smoke-free zone in public places, workplaces, and (public) transportation to protect the health of non-smokers. These should also emphasize SFH, not only the control of smoking in public places.

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References

1. Bonevski B, Paul C, Jones A, Bisquera A, Regan T. Smoky homes: Gender, socioeconomic and housing disparities in second hand tobacco smoke (SHS) exposure in a large population-based Australian cohort. Preventive Medicine. 2014 60:95-101.
2. Gallus S, Lugo A, Gorini G, Colombo P, Pacifici R, Fernandez E. Voluntary home smoking ban: prevalence, trend and determinants in Italy. European Journal of Public Health. 2016 26(5):841-4.
3. Iloh GUP, Collins PI. Awareness of health effects of exposure to secondhand smoke from cigarettes: A cross-sectional study of never-smoked adult primary care patients in Eastern Nigeria. Avicenna Journal of Medicine. 2017 7(4):164-70.
4. Seung Ju K, Kyu-Tae H, Seo Yoon L, Sung-Youn C, Eun-Cheol P, Kim SJ, et al. Is secondhand smoke associated with stress in smokers and non-smokers? BMC Public Health. 2015 15(1):1-10.
5. World Health Organization. WHO Report on the Global Tobacco Epidemic, 2017: monitoring tobacco use and prevention policies: WHO; 2017 [cited 2018 September 25]. Available from: http://www.who.int/tobacco/global_report/2017/en/.
6. David AM, Mercado SP, Klein JD, Kaundan MsoK, Koong HN, Garcia E. Protecting children and families from tobacco and tobacco-related NCDs in the Western Pacific: good practice examples from Malaysia, Philippines and Singapore. Child: Care, Health & Development. 2017 43(5):774-8.
7. Bhat N, Oza S, Reddy JJ, Mitra R, Patel R, Singh S. Effect of anti-smoking legislation in public places. Addiction & Health. 2015 7(1/2):87-91.
8. Saw A, Paterniti D, Fung L-C, Tsoh J, Chen M, Tong E. social environmental influences on smoking and cessation: qualitative perspectives among Chinese-speaking smokers and nonsmokers in california. Journal of Immigrant & Minority Health. 2017 19(6):1404-11.
9. Valera P, Bachman L, Rucker AJ. A Qualitative study of smoking behaviors among newly released justice-involved men and women in New York city. Health & Social Work. 2016 41(2):121-8.
10. Kruger J, Jama A, Homa DM, Babb SD, King BA. Smoke-free home and vehicle rules by tobacco use status among US adults. Preventive Medicine. 2015 78:9-13.

11. Sultana P, Rahman MT, Roy DC, Akter S, Jung J, Rahman MM, et al. Tobacco control policies to promote awareness and smoke-free environments in residence and workplace to reduce passive tobacco smoking in Bangladesh and its correlates. PLoS ONE. 2018 13(6):1-12.
12. Berg CJ, Pinpin Z, Kegler MC. Perceived benefits of smoke-free homes, the process of establishing them, and enforcement challenges in Shanghai, China: a qualitative study. BMC Public Health. 2015 15(1):1-9.
13. King BA, Patel R, Babb SD, Hartman AM, Freeman A. National and state prevalence of smoke-free rules in homes with and without children and smokers: Two decades of progress. Preventive Medicine. 2016 82:51-8.
14. Zheng ZL, Deng HY, Wu CP, Lam WL, Kuok WS, Liang WJ, et al. Secondhand smoke exposure of children at home and prevalence of parental smoking following implementation of the new tobacco control law in Macao. Public Health (Elsevier). 2017 144:57-63.
15. Xiao Z, Martinez-Donate AP, Cook J, Piper ME, Berg K, Jones NR. Battling tobacco use at home: an analysis of smoke-free home rules among US veterans from 2001 to 2011. American Journal of Public Health. 2014 104(S4): S572-S9.
16. Clough AR, Grant K, Robertson J, Wrigley M, Nichols N, Fitzgibbon T. Interventions to encourage smoke-free homes in remote indigenous Australian communities:a study protocol to evaluate the effects of a community-inspired awareness-raising and motivational enhancement strategy. BMJ Open. 2018 8(3).
17. Nichter M, Padmajam S, Nichter M, Sairu P, Aswathy S, Mini GK, et al. Developing a smoke free homes initiative in Kerala, India. BMC Public Health. 2015 15(1):1-9.
18. Tobacco Control Research and Knowledge Management Center. Report on Thai people's tobacco Consumption; 2018 [cited 2018 August 17]. Available from: http://www.trc.or.th/th/images/upload/files/data/tobaccoinfo/situation/2561/situation_2018.pdf.
19. Chotbenjamaporn P, Haruhansapong V, Jumriangrit P, Pitayarangsarit S, Agarwal N, Garg R. Tobacco use among thai students: Results from the 2015 global youth tobacco survey. Indian Journal of Public Health. 2017 61(5):40-6.
20. Thanh Tam T, Vasoontara Y, Dujrudee C, Sam-ang S, Adrian S, Tran TT, et al. Environmental tobacco smoke exposure and health disparities: 8-year longitudinal findings from a large cohort of Thai adults. BMC Public Health. 2015 15(1):1-11.
21. Abdullah AS, Zhenyu M, Jing L, Kaiyong H, Li Y, Zhiyong Z, et al. Addressing parental smoking in pediatric settings of Chinese hospitals: a qualitative study of parents. BioMed Research International. 2014 2014:1-8.
22. Bath J, Wakerman J. Impact of community participation in primary health care: what is the evidence? Australian Journal of Primary Health. 2015 21(1):2-8.
23. Baum F, MacDougall C, Smith D. Participatory action research. Journal of Epidemiology and Community Health. 2006 60(10):854-7.
24. Stephens C. Participation in different fields of practice: using social theory to understand participation in community health promotion. Journal of Health Psychology.2007 12(6):949-60.
25. Campbell LM, Ross AJ, MacGregor RG. The Umthombo Youth Development Foundation, South Africa: Lessons towards community involvement in health professional education. African Journal of Health Professions Education. 2016 8(1):50-5.
26. Gavin VR, Seeholzer EL, Leon JB, Chappelle SB, Sehgal AR. If we build It, we will come: a model for community-led change to transform neighborhood conditions to support healthy eating and active living. American Journal of Public Health. 2015 105(6):1072-7.
27. JuraniĆ B, Rakošec Ž, Jakab J, MikŠiĆ Š, VuletiĆ S, IvandiĆ M, et al. Prevalence, habits and personal attitudes towards smoking among health care professionals.Journal of Occupational Medicine & Toxicology. 2017 12:1-8.
28. Mayer AB, McDermott RJ, Bryant CA, Baldwin JA, Kromrey J. Sustainability of community-based health promotion coalitions: putting theory into practice. Health Behavior & Policy Review. 2017 4(6):511-20.
29. Smith ME, Engquist A, Carvajal C, Johnston-Zimmerman K, Algara M, Gilliland B, et al. Neighborhood formation in semi-urban settlements. Journal of Urbanism: International Research on Placemaking and Urban Sustainability. 2015 8(2):173-98.
30. Greiner KA, Friedman DB, Adams SA, Gwede CK, Cupertino P, Engelman KK, et al. Effective recruitment strategies and community-based participatory research: Community Networks Program Centers' recruitment in cancer prevention studies. Cancer epidemiology, biomarkers & prevention : a publication of the American Association for Cancer Research, cosponsored by the American Society of Preventive Oncology. 2014 23(3):416-23.

31. Ministry of Public Health. Prevalence of smokers in Thai population aged 15 years and over. Health area 4, Pathumthani province; 2018. [cited 2018 August 11]. Available from: http://hdcservice.moph.go.th/hdc/reports/report.php?source=pformated/format1.php [in Thai].
32. Lincoln YS, Guba EG. Naturalistic Inquiry SAGE Publishing; 1985 [cited 2018 August 11]. Available from: https://uk.sagepub.com/en-gb/asi/naturalistic-inquiry/book842#preview.
33. Saw A, Paterniti DA, Fung LC, Tsoh JY, Tong EK, Fung L-C. Perspectives of Chinese American smoker and nonsmoker household pairs about the creating smokefree living together program. Cancer (0008543X). 2018 124:1599-606.
34. Kruger J, Patel R, Kegler M, Babb SD, King BA. Perceptions of harm from secondhand smoke exposure among U.S. adults, 2009-2010. Tobacco Induced Diseases. 2016 14:1-13.
35. Buczkowski K, Marcinowicz L, Czachowski S, Piszczek E. Motivations toward smoking cessation, reasons for relapse, and modes of quitting: results from a qualitative study among former and current smokers. Patient Preference & Adherence. 2014 8:1353-62.
36. Fedota JR, Stein EA. Resting-state functional connectivity and nicotine addiction: prospects for biomarker development. Annals of the New York Academy of Sciences. 2015 1349(1):64-82.
37. Jianvitayakij S, Panpakdee O, Malathum P, Duffy S, Viwatwongkasem C. Factors influencing smoking cessation behavior among thai male smokers with hypertension. Pacific Rim International Journal of Nursing Research; 2014 [cited 2018 September 29]. Available from: https://tci-thaijo.org/index.php/PRIJNR/article/view/12528.

มุมมองของชุมชนไทยต่อบ้านปลอดบุหรี่ในชุมชนกึ่งเมือง: ข้อค้นพบเชิงคุณภาพจากการศึกษาแบบผสมผสาน

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บทคัดย่อ: บ้านปลอดบุหรี่หมายถึงบ้านที่ไม่อนุญาตให้บุคคลใดๆสูบบุหรี่ภายในบ้าน การสูบบุหรี่ในบ้านทำให้สมาชิกทุกคนภายในบ้านได้รับควันบุหรี่มือสอง เป็นอันตรายต่อสุขภาพที่ต้องให้ความสนใจ การศึกษานี้เพื่อสำรวจมุมมองของสมาชิกในชุมชนต่อบ้านปลอดบุหรี่ ในชุมชนกึ่งเมือง เขตปริมณฑล ประเทศไทย การศึกษานี้อธิบายในส่วนของการวิจัยเชิงคุณภาพแบบพรรณนา ซึ่งเป็นส่วนหนึ่งของการศึกษาวิจัยแบบผสมผสานชนิดการวิจัยเชิงคุณภาพก่อนการวิจัยเชิงปริมาณ ซึ่งใช้การสัมภาษณ์กลุ่มทั้งหมด 4 กลุ่ม กับผู้ให้ข้อมูลหลักจำนวน 29 คน ได้แก่ คณะกรรมการชุมชน สมาชิกในครอบครัวของผู้สูบบุหรี่ และผู้สูบบุหรี่ แนวทางการสัมภาษณ์กลุ่มเน้นที่ความเข้าใจเกี่ยวกับควันบุหรี่มือสองและผลกระทบต่อสุขภาพของครอบครัว วิธีการห้ามสูบบุหรี่ในบ้าน และวิธีการที่ชุมชนเข้าเกี่ยวข้องในการส่งเสริมให้บ้านปลอดบุหรี่

วิเคราะห์ข้อมูลโดยการวิเคราะห์เนื้อหา ผลการศึกษา พบว่าชุมชนมีมุมมองต่อบ้านปลอดบุหรี่ 3 ประเด็นหลัก 1) มีเจตคติเชิงลบต่อควันบุหรี่มือสองภายในบ้าน 2) ผลของควันบุหรี่มือสองต่อปัญหาสุขภาพ และ 3) ความเป็นไปได้ในการทำให้บ้านปลอดบุหรี่ ผู้เข้าร่วมการวิจัยเชื่อว่าในการทำให้บ้านปลอดบุหรี่มีความเป็นไปได้โดยการกำหนดให้เป็นวาระของชุมชน ซึ่งต้องการ การมีส่วนร่วมและความร่วมมือระหว่างสมาชิกชุมชน สมาชิกครอบครัว และผู้สูบบุหรี่ ซึ่งควรเพิ่มความเข้มแข็งของครอบครัวในการต่อรองการกำหนดกฎห้ามสูบบุหรี่ และจัดให้มีพื้นที่สูบบุหรี่ภายนอกบ้าน และสนับสนุนผู้สูบบุหรี่ให้เลิกสูบได้ พยาบาลสาธารณสุขมีบทบาทในการสนับสนุนให้เกิดบ้านปลอดบุหรี่โดยการชี้แนะผลักดัน การกระตุ้นให้กำลังใจ และการเสริมสร้างพลังอำนาจให้ผู้สูบบุหรี่ลดหรือเลิกสูบบุหรี่ รวมถึงการจัดให้มีแนวทางสำหรับครอบครัวของผู้สูบบุหรี่ ในการนี้เพื่อช่วยเสริมสร้างความเข้มแข็งของการปฏิบัติของชุมชนในการป้องกันควันบุหรี่มือสองและลดการสูบบุหรี่ลง

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A Grounded Theory of Becoming a First–time Father due to a High Risk Pregnancy

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Abstract: Nursing care during pregnancy usually focuses on the conditions of the mothers rather than fathers, especially during a high risk pregnancy, but first-time fathers confronting such a pregnancy face serious challenges and pressures that effect their lives and relationships. This study explored the process of Thai men becoming a first-time father with a high risk pregnancy to better understand what they faced and how they coped. Twenty-three volunteer informants were recruited from an antenatal clinic in northern Thailand. Interview data were collected and analyzed using grounded theory methodology.

The findings demonstrated that *Striving for a Healthy Baby* was the core category of the basic social process and consisted of three phases, each with its strategies. 1) *Stressing about high risk pregnancy,* with the strategies of dealing with emotions, seeking care, and modifying behaviors. 2) *Hoping baby and wife will be healthy*, with the strategies of dealing with emotions, seeking special care, modifying behaviors, and making a relationship with the baby, and 3) *Handling uncertain outcomes*, with the strategies of dealing with higher levels of worry, seeking the baby's safety, preparing for difficult outcomes, and making a relationship with the baby. Throughout the study Buddhist beliefs strongly influenced the actions of the fathers. This study adds new cultural knowledge about the concerns, needs, and strategies of expectant Thai fathers due to a high risk pregnancy that will enable nurses, midwives, and healthcare professionals to assist and care for them.

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Introduction

Becoming a first–time father is a great time of change in a man's life.[1,2] Men confront various challenges and pressures, especially when a high risk pregnancy (HRP) is involved.[3] Pregnancy is a demanding period for expectant fathers, and it is a part of their transition to fatherhood.[4] However, when complications and increased risks are added to the pregnancy, expectant

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fathers gain additional stressors that impact their emotional and physical energy to deal with their process of becoming a father.[3] They may lose a sense of control and become isolated as they face threats of risky physical conditions in their pregnant wives and unborn baby. Some special antenatal care and treatment may also affect expectant fathers who often act as a primary care giver.[5,6]

In the traditional Thai family, fatherhood has been influenced by religious beliefs, community structures, family relationships, and masculine and feminine roles.[7,8] The father's role was often traditionally that of a farmer working in the fields, while the maternal roles were of housewife, and care-taker of babies and elders.[9] Since the 1970s, Thailand has moved from an agricultural to an industrial society. Rapid socioeconomic development has had a great impact on the function and structure of Thai families.[10] The roles of women have changed, and working fathers are now expected to share in household work. The new generation of Thai fathers are required to be both breadwinners and involved in parenting.[9] They are now expected to be involved in their partner's pregnancy, birth, and childcare activities. These changes have been promoted and supported by national policies and projects encouraging men to participate in childbearing and childrearing[7,11] with the aim of improved physiological and psychological development of the children and of the well-being of the family. The role of Thai expectant fathers has a core centered around protecting the unborn baby.[12] Previous studies have explored fathers' experiences with normal pregnancies rather than HRP, the latter of which has been increasing in Thailand and globally.

From 2013-2015, HRP in northern Thailand was reported at 42.60, 38.90, and 39.20 percent of all pregnant women visiting university hospital antenatal clinics, respectively.[13] Causes of maternal mortality during pregnancy include severe bleeding, infections, and hypertensive disorders, associated with neonatal mortality.[14] High-risk pregnancy is classed into medical and obstetrical complications. Medical complications include heart disease, thalassemia, and systemic lupus erythematosus. Obstetrical complications include pregnancy-induced hypertension, gestational diabetes mellitus, and multiple gestations.[15] High-risk mothers are referred to high-risk clinics of tertiary or university hospitals for specialized care. These mothers require advanced diagnostic investigation and management. Most also need specialized care and support from their husband, which can be quite demanding. As a consequence, expectant fathers may lose a sense of control, and/or become isolated while they confront the threats facing their pregnant wives and unborn child.[16,17] These stressors impact expectant fathers' lives and roles, as well as their actions and interactions with themselves, their wives, and their social network.

Unfortunately, no studies were found investigating expectant fatherhood in the context of HRP. Most of the literature has addressed HRP more or less exclusively via the experiences of women. When HRP and fatherhood is discussed, it is often as an interesting footnote to the central issue of the expectant mother. The clinical and scientific knowledge that is available on men and HRP provides much raw material for reflection and investigation, yet is insufficient to provide conclusions about the processes of fathers struggling with this. Therefore, this study explored the gap of knowledge concerning the process among Thai expectant fathers with a HRP.

Study aim

The research question of this study was "What is going on in the process of becoming a first-time father among Thais whose wives have a high-risk pregnancy?"

Theoretical framework

Symbolic interaction (SI)[18] was used as the theoretical framework in this study by way of grounded theory methodology. SI is not only a philosophical orientation underlying the method, but is also a dominant theoretical code to guide analysis.[19,20] It was the underlying assumption that Thai expectant fathers in this study shared a common social psychological problem, which they are normally unaware of at a conscious level.[21] This guided an assessment of expectant fathers and an understanding of how they interpreted the meaning of their experiences, situations, actions, and interactions; and discovered the processes of individual interactions and human behaviors during the HRP situation.

Method

Study Design

Grounded theory methodology is based on symbolic interaction to explore social processes with the goal of developing a theory[22] that can account for a pattern of behavior which is relevant and problematic for whose involved.[21] It is also useful in generating initial substantive knowledge that emerges from the grounded data through social interaction.[22]

Sample and Setting

Informants were recruited from an antenatal clinic (ANC) at a university hospital in northern Thailand. A purposive recruitment criteria was used: Thai men whose their wives had been diagnosed with a HRP, >20 years of age, living with their wife during the pregnancy, and never having experienced a live birth with this or another female partner. All of the HRP conditions could be managed and none progressed into a more severe class of HRP.

Ethical Considerations

This study was approved by the ethical committees of the Faculty of Nursing and Faculty of Medicine, Chiang-Mai University [study code=NONE-2557-02547]. All informants completed written consent forms, and their rights were protected throughout the study. Data collection, management and analysis processes met ethical standards of confidentially and security.

Data collection

Grounded theory guided data collection and analysis that was concurrent and spiral, rather than linear, and involved constant comparison.[22] Informants were recruited when women diagnosed with HRP visited the ANC of the university hospital. Informants were invited to participate in this study by an invitation letter. Interested fathers who volunteered to participate left their names and phone numbers in a response box at the ANC. The principal investigator (PI) connected with the informants by phone to make an appointment for interviewing. In-depth interviews were conducted using an interview guide which was developed on the research question using open-ended questions[20,22], for example: "Can you tell me about your experiences of being a father with your wife diagnosed as having a high risk pregnancy?" During the interview, the PI used probing questions to clarify and elaborate the details of each participant's experiences such as "… can you tell me more about that", "…I am not quite clear about that, can you explain more about that please?", and "…what do you mean?". Each informant was interviewed for 25-60 minutes, 1-3 times until the data was saturated.

Data analysis

After finishing each interview, a verbatim transcription was done. Line-by-line open coding was performed to identify concepts, and conceptualize underlying patterns.[22] As data analysis progressed categories were formed, and with properties and dimensions.[23] The PI wrote memos of her thoughts and striking ideas about what needed clarification, what additional questions should be asked, and guidelines for the next participants.[19,21] Theoretical sampling to select the next participants was based on the emerging categories and their properties, until saturation was reached.[23] Constant comparison and verification was done, comparing to codes within the same interview, across interviews with the same participant, and across participants. Similarities and differences in codes were noted, and related codes were clustered into categories. Theoretical coding was done by giving names to codes that explained how the substantive codes were related to each other. Then, core categories became woven into the whole of the study by the linking of all categories around selective coding[20,22]. The main concerns of Thai men becoming fathers during a HRP situation emerged from the data.

Rigor of study

This study used fit, workability, relevance, modifiability[20,23] and credibility[22] as the rigor of grounded theory. Fit means that the categories must fit with the data. The PI checked this by constant comparison and conceptualization of the data.[23] For relevance the emergent concepts relating to the true issues of the informants in the substantive area were checked by using theoretical sensitivity and considering the notion of the basic social process. For workability, the core categories and sub-core categories that accounted for most of the variation of behavior in the substantive area were examined to explain what was happening; predict what will happen; and interpret what happened in the substantive inquiry. Therefore, the concepts and their theoretical coding were tightly related to what was going on.[23] Modifiability is very important, and the researcher ensured that all the concepts important to the theory were incorporated during the constant comparison process.[23] Credibility refers to internal validity in qualitative research, which was approached by peer debriefing and member-checking. The PI showed transcripts, relevant documents, memos, and field notes during the investigation to the research team. The peers discussed and reviewed through the process of data analysis, coding and interpretation. Finally, the PI returned the results of the study to some informants to share the emerging picture with them, and they confirmed that the findings did indeed reflect the processes of expectant fathers[22] with a wife with a HRP.

Findings

There were 23 informants in this study. Their ages ranged from 20 to 38 years old. All were Buddhist and their occupations were categorized as a businessmen (n=9), freelance workers (n=5), government officer (n=3), government employee (n=2),a private company employee (n=2), and an agriculturist (n=2). Informants' household income per month ranged from 10,000 to 80,000 baht per month (US\$362-\$2,500 per month). Most informants had a fair economic status in that income was in the range of 10,000 - 20,000 baht per month (US\$362-\$625 per month)(n=10). The gestational age of informants' pregnant wives was between $37-38^{+}$ weeks (n=22) and 40^{+} weeks (n=1). Characteristics of the HRP were categorized by a pregnancy diagnosis of: 1) Preexisting disease (n=10); diabetes mellitus (DM), immunization disorder, thyroid disorder, rheumatic heart disease; 2) High risk diagnosis during pregnancy (n=12); thalassemia trait, GDM, pregnancy-induced hypertension (PIH), ovarian tumor or cancer; or 3) Gaining high risk with preexisting disease during pregnancy such DM with PIH (n=1).

The core category of *Striving for a healthy baby* was the process by which the informants managed their main concerns and developed into fathers. This process consisted of three phases:1) stressing about HRP; 2) hoping baby and wife will be healthy: and 3) handling uncertain outcomes. (Figure 1)

For many informants striving for a healthy baby began when they learned of the diagnosis of HRP through screening and diagnostic results given by the obstetrician. At this time, their wife presented with obstetrical complications such as diabetes or PIH. However, some informants had wives with preexisting medical diseases such as heart disease, immunization disorder, chronic hypertension, trait-thalassemia, and diabetes mellitus. These informants faced the stress of complications earlier than the other fathers. Their

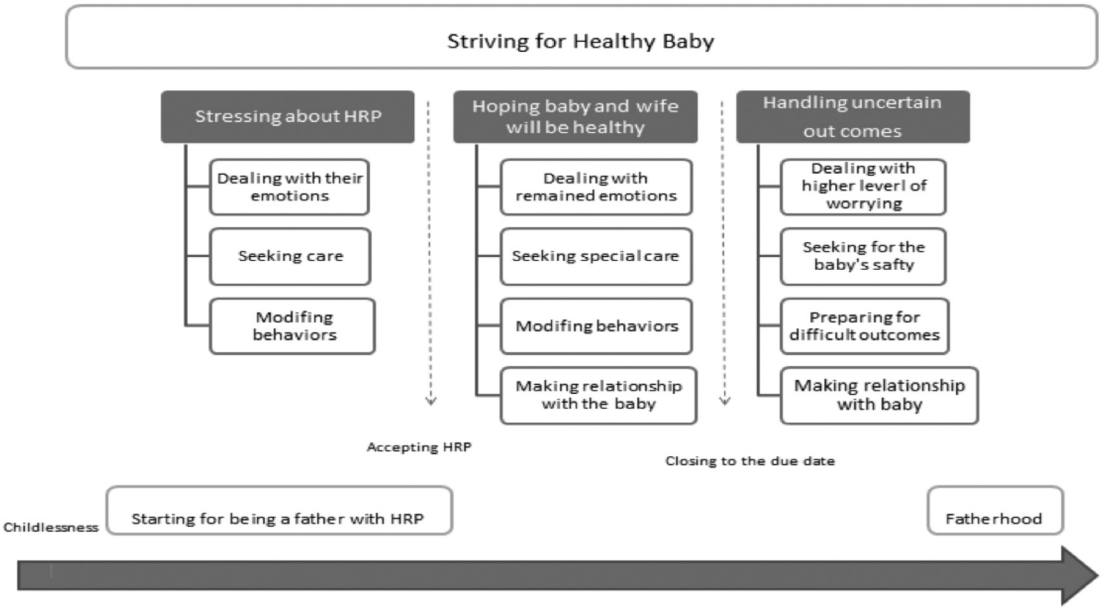

Figure1: Findings from study among Thai fathers whose wives had a high risk pregnancy.

stress began from the moment they knew that their wife was pregnant. Therefore, the starting time of knowing and facing the stress of high risk pregnancy among informants was different; however, the sequence of the three phases among *Striving for a healthy baby* was similar after the beginning point.

Stressing about HRP

Stressing about HRP was the beginning phase that informants experienced with the high risk pregnancy diagnosis. It made them feel worried and under pressure; they had many problems to cope with in this crisis situation. This phase lasted around 1-2 months after they received the HRP determination and they used three strategies to manage this stress: dealing with their emotions, seeking care, and modifying behaviors.

Dealing with their emotions: Informants had direct experiences with unfavorable emotions such as shock, sadness, disappointment, anxiety, fatigue, chaos, worry, and concerns about the pregnancy, their baby, and their wife. They felt unsure about the pregnancy screening, testing and diagnosis. They asked for re-confirmation of HRP screening tests to make certain that the situation was real, for example:

> *When my wife called me and told me that she has a risky pregnancy and it may affect our baby, I automatically asked her about the test, and was the result sure? In my mind, I was very confused and felt as disappointed...* (P11/1L182-186)

All informants were Buddhist with their own background and beliefs related to *karma* and *chao kam nai wen*. They felt the HRP happened to them and their family due to *karma* (the Buddhist law of cause and result) from this life and previous lives. *Chao kam nai wen* are spirits or ghosts of person who passed away, with whom one has previously interacted, and whom one has harmed in some way. The *chao kam nai wen* can appear in this life making trouble in a person's life, and requiring some kind of appeasement or retribution for the past wrongs done to them. These informants, facing karmic trouble, possibly from a *chao kam nai wen*, often went to temples and monks to make merit (doing good actions to create *good karma*), dedicated their merit to the *chao kam nai wen*, prayed to the Buddha, and made vows to the Buddha and/or supernatural entities until the baby was delivered safely. They believed that making (and dedicating) good merit could improve their *karma* and appease *the chao kam nai wen*, both of which serve to help the HRP pass smoothly.

> *...I concerned all my activities, I went to making merit often more than the previous time. I did only good karma. I hoped that all my good merit or good Karma would send to chao kan mai wen of me and my wife. I hoped that it could help my baby would birth with healthy and less complications...* (P10/1L614-620)

Seeking care: Informants sought information about the HRP condition and how it might affect their unborn babies and wives. They looked for further treatments, and tried to find ways to help with some side effects that their wives may experience. They were worried that their baby may be lost through miscarriage.

Modifying behavior: Informants started to change their behavior because they thought that it might affect their baby, their wife, or the pregnancy condition. They managed their multiple roles by arranging their time to care for and accompany their wife to the clinic/hospital. They acted as a strong husband to support their wife, although in their mind, they felt weak, sad, and disappointed. But they could not express their feelings to their wives because they did not want them wives to feel even worse.

Hoping baby and wife will be healthy

This phase started after accepting the diagnosis of HRP, usually until 32 weeks of gestation. By this time the HRP wife had already been referred to a specialty clinic at the university hospital and received some specific treatment and care. Such treatments and medicine were used to manage the HRP, varying on the disease and severity. Informants did their best in their roles of father and husband. Their main concern was about whether their unborn baby would be healthy and safe, then they tried to deal their other motions, seeking special care, modifying their behavior, and making relationship with baby to manage their needs and concerns during this phase.

Dealing with remaining emotions: By this time informants had calmed down and felt better than in the previous phase, due in part to positive responses of their HRP wife to the medical treatment. However, they were still confused, worried and concerned about the effects of the disease and medicine on their wife and unborn baby. They dealt with their remaining emotions by seeking more information about the HRP condition from the internet, friends, obstetricians, nurses, or healthcare-providers:

> *...however the doctor said that my baby was growing well and has some resistance to the medicines that my wife had been taking. I still thought that my baby may have some effects from the disease or medicines. Although the doctor said that there was only a 1-2% chance of being disabled, I still felt that it may happen because it is not 100% safe...* (P11/1L412-417)

During this phase the men felt like they were quite often neglected, on the other side of the doors at the ANC examination and ultrasound rooms, while their wives were being examined. They were not allowed to accompany their wives into those rooms. They suggested that it might be good if they could stay with their wife because they wanted to know what was going on.

> *...when my wife goes to get examined by the doctors I never go with her. I don't know if could I go with her or not because no one told me about that. Every time the staff just called my wife's name and told her to see the doctor, just that. If I had some chance to go with her, it may be good because I wanted to see the examination. I wanted to see the ultrasound and I wanted to see my baby. I would feel better if I saw everything with my own eyes more than only hearing from my wife...* (P6/1L398-403)

Seeking special care: They started looking for special clinics or hospitals that were famous and popular for taking care of HRPs. They searched the internet, and talked with relatives, friends, colleagues, and healthcare professionals. They applied some of what they learned in their daily care for their wife, especially regarding nutritional concepts related to the disease or HRP conditions.

They also sought out local Northern-Thai traditional care, such as some physical activities, herbs, and foods that they believed that could control HRP, reduce the effect from the medicine/treatment, and promote the health of their pregnant wife and unborn baby. They prepared and gave boiled water of custard apple leaf, sweet gourd juice, and mangosteen juice to their wives. They believed that these herbs and fruits could help fight against dangerous cells, increase the body's immunity, control blood pressure levels, and improve general conditions. However, they confirmed with the obstetrician or nurses for before giving these foods to their wife.

> *...I searched form the internet about alternative care for my wife. I found that drinking mangosteen juice could kill abnormal cells in our body, so I thought that this would be good for my wife with her high risk condition. I hoped it could help her have good immunity and keep her well until the due date...* (P2/2L295-299)

Informants placed prohibitions on their wife according to local traditional beliefs that they had heard from their elder relatives and/or parents. They were concerned that certain behaviors may affect the HRP conditions. They prohibited their wives from eating salang food (e.g. rare meat/beef/food, strong smelling food, and salted food) because these were not good for the health. They prohibited their wife from going to funerals or inauspicious events because these could effect to their wife and baby's health. They did not allow their wives to sew any cloth during the night time because this activity may lead to problems or difficulties during the birth.

Modifying behavior: During this time all HRP mothers had regular visits to the HRP clinic of the university hospital. Informants performed the duty of protector and supporter. They used empathy to support of their wives emotions, took care and protected their HRP wife and baby. They also supported them with nutrition, dietary control, vitamins, medicine, housework; they adjusted their working time, managed the money, and importantly, accompanied their wife on ANC visits. They supported their wife emotionally because they felt empathy for her discomfort, the complications, and the suffering from the treatment. Significantly, during the HRP crisis situation, they felt that their relationship as a couple strengthened, for example:

> *...I spent more time with her than previously. I took her to the hospital, and other places. I accompanied her to as many places as I could. I felt empathy for her, but I could not do more. I just support her as well as I could by talking good and positive words or conversation to her. It would be good if we had more time together without her disease...* (P22/2L177/179)

Informants modified their own behavior, stopping some of their behaviors due to traditional beliefs about merit and sin. They thought that their activities may affect their unborn baby's health. They did not clip their nails or dig a hole in the ground because they believed that their baby may have a difficult birth or some disability. They did not kill animals, because it was a sinful activity that may cause some complication for their beloved baby, or could even make the baby disabled or die.

> *...I stopped my fishing and cock fighting. I believed that my baby could receive bad effects from these. I had seen with my own eyes - my niece, she was a clef-lift and clef-palate girl, because during her mother's pregnancy her father went fishing and got hooks into the fish's mouth. Then the sins were felt on my niece.* (P6/1L218-222)

Making relationship with baby: Informants were fully conscious that the pregnancy was a real when at around 6-7 months the abdomen was so much bigger than before. They only felt the pregnancy and the baby were totally real when they could touch and feel the baby's movement clearly. Perceiving the pregnancy as real was reported when they had seen ultrasound pictures of their baby. This was also when they felt that being a father was real. The relationship between informants and their babies in the womb was strengthened at this time. They made relationship with their baby by touching, talking, reading books, and playing music to their baby, because they wanted the baby to know them and recognize their voice. Importantly, they did these things that they learned from the internet, books, magazines and healthcare providers, in the hope that their baby would have good and normal development, such as:

> *...when she began five months, her belly was larger than four months. When her belly enlarged I just had awareness and it reminded me that the pregnancy was real. Even though I already know that she was pregnant I just became truly conscious now, that I will have a baby. It is a real. It was not a dream* (laughing)...(P4/1L79-80)

Handling uncertain outcomes

The last phase started around 32 weeks of gestation and continued until birth. The informants were dealing with high levels of worry about uncertain outcomes, striving for safety of their baby, preparing for difficult outcomes, and making a relationship with the baby in the form of unconditional love.

Dealing with higher levels of worrying: In this phase the informants had more worry and concerns about their wife and unborn baby's health even though they had known about the condition and possible complications for some time. They wanted their baby to be born safe and healthy. They often went to make merit, praying to Buddha and other supernatural spirits for their baby's health:

> *...I prayed every night for my baby and for my wife to be safe and healthy. I didn't pray for myself because I thought that it was enough for my life. But I just wanted my baby and my wife safe. I want my baby healthy without any complication when he is born. I want him to be like other normal children. I prayed and thought in my heart every night...* (P4/1L543-557)

Seeking for the baby's safety: Their higher levels of worrying was often about some emergency HRP condition that could happen, such as a "rigid abdomen". They searched for more information about labor and dangerous signs from the internet, health professionals, family, and friends. They looked for nearby private clinics and hospitals in case any complications happened. They planned and prepared their wife to ask for help from their relatives, colleagues, and neighbors, and prepared to use the emergency rescue service, which is by dialing 1669. Some were informed by the obstetrician that the birth method would be a cesarean section, so they asked friends, relatives, and colleagues to donate blood for their wife.

> *...I often told and reminded my wife that if she had labor pain when I wasn't with her she should call 1669. I told her to ask for help from our neighbors to bring her to the hospital..... and in the night time she should go in the main entrance of hospital and go directly to the emergency room...* (P13/1L284-289)

Preparing for difficult outcomes: Informants' feelings of insecurity and uncertainty about the baby's condition came back again. They prepared their mind and planned for difficult outcomes: if their baby was born unhealthy, or abnormal, or with disability. They comforted their mind by thinking that it was dependent on *karma* involving actions in many past lives. They had faith about destiny in that it could direct everything to happen with their family. They could accept if their baby was born with some problem or difficult outcomes because they already loved their unborn baby. They also prepared their wife, comforting her mind that she should accept whatever outcome occurred.

> *I just loved my baby. And even though I didn't know if my baby would be affected from my wife's disease or not, I still loved and I accepted. This is my baby so I will take care the best that I can. I hope that all my good merit, good karma would affect my baby's health and the birth will be without complications...*(P10/1L66-620)

Planning for the baby's health care, deciding about baby items, and gathering the family's money for newborn care were reported. The expenditure for newborn care and treatment after birth could not be fully determined yet because it would depend on the baby's conditions and health. Thus, the informants thought about and prepared for the immediate baby care after birth.

Most did not prepare baby items because they had their traditional belief that their baby may be lost if they prepared such items before birth. This belief had been passed down from their parents, elder relatives, and from their experiences:

> *...my elder relatives, they told me that I shouldn't buy any things for my baby this time because it wasn't good for my baby and my wife. It could make a bad situation such birth difficulty or some other bad situation during the birth time.* (P5/1 568-575)

Making a relationship with the baby: Informants strengthened their relationship with the baby more during this phase. They wanted to see their baby's face soon, and in a healthy condition. They prepared a nickname for their baby, but they could not settle on a given name yet. By tradition, the given name depended on the date of birth because each day had some prohibited letters which could not be used in the name. They wanted to select the best given name for their baby, because, according to their belief the name had lifelong influence. So informants had to wait until the birth date for the proper given name, and before that they just used the baby's nickname.

> *...I called my baby in the womb 'Aey Aey'. It was just a word for calling my baby. We already had her nick name as "O-new" that my wife had chosen because it's related to her name. I didn't have her given name yet because I would wait until she was born.* (P2/1L138-65)

Activities of informants during this phase were concerned with their baby's safety and health more than their own. They could be brave their whole life for their baby. They often went to make merit and pray for their baby's health. They prayed to supernatural powers in the belief that it that could help their baby. Although the baby might be born with complications or disabilities, they would still love their baby and would take good care until the end. They interacted with their baby, strengthening the relationship with full love. Then all of their activities were as a brave father who loved his baby, striving for its survival and health:

> *...I could do anything and work hard for my baby. I may get tired in my work but I could do it for my wife and my baby. Today...please bring my life (crying)...could I give my life for my baby's life? I want to give anything that I can. I wanted to exchange my life and health for my baby's life and health. I only want my baby safe and alive...* (P2/2L391-396)

During the pregnancy, the informants faced and experienced many emotional changes, favorable, unfavorable, and mixed emotions related to each phase of the pregnancy, their concerns about the effects of HRP on the health of their unborn baby, and the process of becoming a first time father with a high risk pregnancy wife. All of this is part of the process of *Striving for healthy baby.*

Discussion

This study was directed by the perspective of symbolic interaction[19] to interpret the experiences, situations, actions, and interactions, and to discover the processes of individual interactions and human behaviors of expectant Thai fathers whose wife had a high risk pregnancy within the context of Thai society as a basic social process. *Striving for a healthy baby* emerged from the data as a core category, the process that the expectant fathers carried out through the period of pregnancy. They performed multiple duties and roles such family member, son, partner, worker, being a father, and member of society[7,9] all while their wife was having a HRP[1,5].They balanced all their roles and dealt their main concern of first dealing with their emotions as a strong family leader[2,5,7] and trying to be a good husband and father.[6,7,12] They also thought more about and made additional plans to deal with further uncertain situations concerning caring for mother and baby, finances, and their work.[5,24,25]

They were a major supportive and protective person for their wife. They provided good care involving nutrition, medicine, dietary control, and others things[12,16,17] in the hope that the HRP condition would not get worse, and that their unborn baby and wife would be safe and healthy. Importantly, this study found that the crisis situation of their HRP wife and unborn baby lead to a strong relationship between the father and their unborn baby. Men were inspired to be brave for their unborn baby. They proposed exchanging their life for their unborn baby. They were ready to die for their baby.

Buddhist perspectives influenced men's beliefs, their mind, their acceptance, and their behavior during the HRP period as a basic socializing process. They acted to solve their *karma* and *chao kam nai wen* issues. *Karma* was seen as an important contributing factor to the health and disease of their wife and baby. The present situation was the effect of good and bad karma in the past[7,12] *Chao kam nai wen*, spirits one has harmed in a past life, needed to be appeased to protect the mother and baby. In short, Thai expectant parents believe that their pregnancy condition and health were effect by their *karma* and bad situations with *chao kam nai wen* and so actions were taken to deal with both.

Northern Thai traditional cultural beliefs were represented as the background of men's behavior during the HRP period as part of a basic social process passed from the previous generation to the next.[12] Men acted themselves, doing some things and avoiding others to protect their wife and baby in accordance with these traditional beliefs. They were willing to follow the way of traditional beliefs for their baby's health and safety.

They needed and sought more information from the internet, other experienced people, and especially healthcare providers about taking good care of their HRP wife. They accepted themselves as a partner in the HRP and they wanted to engage as a part of the process rather than being left waiting outside the door.[1,26,27]

Strengths and Limitations

Member checking and peer debriefing was done as a thoroughly and as rigorously as possible, and this research was guided by grounded theory and theoretical sensitivity was employed. This is of concern during interviewing for data collection. Doing theoretical sensitivity during each interview helps the researcher reach and get more data by further probing interviewing questions in real time during the interview rather than later seeing something in the transcription and data analysis process and going back to the field again. One limitation is that this study was undertaken in northern Thailand and the findings may not be applicable to other parts of Thailand with some different cultural understandings about fatherhood.

Conclusion and Implications for Nursing Practice

This study adds new knowledge about the concerns, needs and strategies of expectant Thai fathers with HRP wives that will enable nurses, midwives, and healthcare professionals to assist and care for them. The study presents the process of *striving for a healthy baby* as the center of a core category which was divided into three phases: *stressing about HRP; hoping baby and wife will be healthy; and handling uncertain outcomes*. They used the strategies to manage their needs and concerns: dealing with emotions, seeking care, modifying behavior, dealing with remaining emotions, seeking special care, modifying behavior, making relationship with baby, dealing with higher levels of worry, seeking for the baby's safety, and preparing for difficult outcomes. Some of the strategies were used across all the phases; some were used only for specific phases.

Northern Thai traditional cultural and Buddhist beliefs influenced first time fathers' experiences, shaping their attitudes and performance around being a new father, especially the role of partner and father of the unborn baby. The unique knowledge gained from this study was that although they had many strong, difficult, and unfavorable emotions, the men performed their activities with their highest intention to be a brave father, striving their baby's safety and health. A better understanding of these experiences will enable nurses and midwives to assist and care for them to aid in their success in becoming a father.

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References

1. Poh HL, Koh SS, He HG. An integrative review of fathers' experiences during pregnancy and childbirth. International Nursing Review. 2014 :543-554. doi:10.1002/casp. 2183
2. Poh HL, Koh SS, Seow HC, He HG. First-time fathers' experiences and needs during pregnancy and childbirth: A descriptive qualitative study. Midwifery. 2013 30(6): 779-87. doi: 10.1016/j.midw.2013.10.002.
3. American Psychological Association. The changing role of the modern day father. 2016. [cited 2018 April 28]. Available from http://www.apa.org/pi/families/resources/changing-father.aspx
4. Asenhed L, Kilstam J, Alehagen S, Baggens C. Becoming a father is an emotional roller coaster - an analysis of first-time fathers' blogs. Journal of Clinical Nursing. 2013 : 1309-1317. doi.org/10.1111/jocn.12355
5. Betts D, Dahlen H G, Smith C A. A search for hope and understanding: An analysis of threatened miscarriage internet forums. Midwifery. 2014 30: 650-656. doi: 10.1016/j. midw.2013.12.011.
6. Tanasirijiranont, R. Becoming a father: Childbearing perspective. Nursing Journal. 2016 43:139-147.
7. Sriyasak, A., Almqvist, AL, Sridawruang C., Neamsakul, W., & Haggstrom-Nordin, E. The new generation of Thai Fathers: Breadwinners involved in parenting. American Journal of Men's Health. 2016:1-11.doi:10.1177/1557988316651062
8. Sriyasak A, Almqvist AL, Sridawruang C, Haggstrom-Nordin E. Father role: A comparison between teenage and adult first-time fathers in Thailand. Nursing and Health Sciences. 2015 17:377-386. doi.org/10.1111/nhs.12200
9. Mclaughlin, K. & Muldoon, O. Father Identity, Involvement and Work-family balance: An In-depth interview study. Journal of Community & Applied Social Psychology. 2014 : 439-452. doi:10.1002/casp.2183
10. World Bank. Country and lending group, 2016. [cited 2018 April 28]. Available from http://data.worldbank.org/about/country-and-lending-group#Upper_middle_income
11. Ministry of Health. Action plan for 2018: Reproductive Health Office. Department of Health. 2018. [cited 2018 April 28]. Available from https://www.anamai.moph.go.th/main.php?filename=Department_2016 [in Thai].
12. Sansiriphan N, Kantaruksa K, Klunklin A, Baosuang C, Jordan P. Thai men becoming a first-time father, Nursing and Health Sciences. 2012 12:403-409.
13. Sirivatanapa P, Tongsong T, Wanapirak C, Piyamongkol W, Sirichotiyakul S, Tongprasert F, Srisupandit K, Luewan S, Traisrisilp K, Sekararithi R, Yampochai A, Taggapichitti A, Leopreecha U. Maternal-Fetal Medicine 2013: Annual report. Chiang Mai: Department of Obstretrics and Gynecology Faculty of Medicine Chiang Mai University; 2016.

14. WHO. Maternal and reproductive health. Global Health Observatory (GHO). 2016 [cited 2018 April 28]. Available from http://www.who.int/gho/maternal_health/en/index.html
15. Rocci SS. Nursing management of pregnancy at risk; pregnancy related complications. In SS Rocci (Ed). Essentials of maternity, newborn, and women's health nursing, 499-540; Philadelphia, PA: Lippincott Williams & Wilkins; 2016.
16. Ge L, Wikby K, Rask M. Lived experience of women with gestational diabetes mellitus living in China: a qualitative interview study. BMJ Open 2017;7:e017648. doi: 10.1136/bmjopen-2017-017648
17. Hantoosh Zadeh, S., Shariat, M., Farahani, Z., Dehghan, P., Mansory, R., Chegini, N., Amini, F. Assessment of the relationship between recurrent high-risk pregnancy and mothers' previous experience of having an infant admitted to a neonatal intensive care unit. Journal of Midwifery and Reproductive Health, 2015 3(1): 293-297. doi: 10.22038/jmrh.2015.3585
18. Blumer, H. Symbolic interactionism. Englewood Cliffs: Prentice-Hall; 1969.
19. Glaser, B. G. Basics of grounded theory analysis: Sociology Press; 1992.
20. Glaser, B. G. Doing grounded theory: Issues and discussions. Mill Valley, CA: Sociology Press; 1998.
21. Wuest, J. Grounded theory: The method. In P. Munhall (Ed). Nursing research: A qualitative perspective. Sudbury, MA: Malloy; 2012, pp.225-256.
22. Glaser, B. G. & Strauss, A. L. The discovery of grounded theory: Aldine; 1967.
23. Glaser, B. G. Theoretical sensitivity. Mill Valley, CA: Sociology Press;1978.
24. Alio AP, Mbah AK, Shah K, August EM, Dejoy S, Adegoke K, et al. Paternal Involvement and Fetal Morbidity Outcomes in HIV/AIDS: a population-based study. American Journal Men's Health. 2013 9 (1): 6-14.
25. Hildingsson I, Johansson M, Fenwick J, Haines H, Rubertsson C. Childbirth fear in expectant fathers: Findings from a regional Swedish cohort study. Midwifery. 2013 30 (2):242-7. doi: 10.1016/j.midw.2013.01.001
26. Nilsen AB, Waldenström U, Rasmussen S, Hjelmstedt A, Schytt E. Characteristics of first-time fathers of advanced age: a Norwegian population-based study. BMC Pregnancy Childbirth. 2013 :13-29. doi: 10.1186/1471-2393-13-29
27. Schytt E, Bergström M. First-time fathers' expectations and experiences of childbirth in relation to age. Midwifery. 2014 30 (1):82-8.

การเข้าสู่การเป็นบิดาครั้งแรกขณะที่ภรรยามีภาวะเสี่ยงสูงขณะตั้งครรภ์: การศึกษาโดยใช้ทฤษฎีพื้นฐาน

รัตนาภรณ์ ธนศิริจิรานนท์ กรรณิการ์ กันธะรักษา นันทพร แสนศิริพันธ์ Pamela Lynne Jordan*

บทคัดย่อ: การพยาบาลส่วนใหญ่ในขณะตั้งครรภ์มุ่งเน้นไปยังสตรีตั้งครรภ์มากกว่าผู้ที่จะเป็นบิดา โดยเฉพาะอย่างยิ่งเมื่อสตรีตั้งครรภ์มีภาวะเสี่ยงสูง ผู้ที่จะเป็นบิดาครั้งแรกต้องเผชิญกับความท้าทาย ความกดดันต่างๆ ที่อาจกระทบต่อความสัมพันธ์และชีวิตส่วนตัวของผู้ที่จะเป็นบิดาเอง วัตถุประสงค์ของการศึกษาครั้งนี้เพื่อศึกษากระบวนการและความห่วงกังวลของผู้ที่จะเป็นบิดาครั้งแรกขณะที่ภรรยามีภาวะเสี่ยงสูงขณะตั้งครรภ์ ผู้เข้าร่วมวิจัยเป็นชายไทยจำนวน 23 คน ที่มารับบริการจากคลินิกฝากครรภ์ของโรงพยาบาลมหาวิทยาลัยแห่งหนึ่งทางภาคเหนือของประเทศไทย ข้อมูลถูกเก็บรวบรวมโดยการสัมภาษณ์เชิงลึกและวิเคราะห์ข้อมูลบนพื้นฐานของระเบียบวิธีวิจัยเชิงทฤษฎีพื้นฐาน

ผลการศึกษาแสดงว่า “การฝ่าฟันอุปสรรคเพื่อสุขภาพที่ดีของทารก” เป็นกระบวนการพื้นฐานทางสังคมที่ได้มาจากข้อมูลหมวดหมู่หลัก ซึ่งเป็นกระบวนการผู้ที่จะเป็นบิดาใช้ในการจัดการกับความห่วงกังวลและความต้องการ และเพื่อพัฒนาการเป็นบิดาเมื่อภรรยามีภาวะเสี่ยงสูงขณะตั้งครรภ์ ซึ่งแบ่งเป็น 3 ระยะ 1) ความอึดอัดใจจากการเผชิญการตั้งครรภ์เสี่ยงสูง กลวิธีเพื่อจัดการความห่วงกังวลและความต้องการของตนเองได้แก่ การจัดการกับอารมณ์ การแสวงหาการดูแล และการปรับเปลี่ยนพฤติกรรม 2) การปรารถนาให้ภรรยาและบุตรในครรภ์ปลอดภัยและแข็งแรง กลวิธีเพื่อจัดการความห่วงกังวลและความต้องการของตนเองได้แก่ การจัดการกับอารมณ์ที่ยังคงค้างอยู่ การแสวงหาการดูแลพิเศษ การปรับเปลี่ยนพฤติกรรม และการสร้างสัมพันธภาพกับบุตร 3) การจัดการกับผลลัพธ์ที่ไม่แน่นอน เริ่มประมาณเดือนที่ 8 ของการตั้งครรภ์จนถึงกำหนดคลอด กลวิธีเพื่อจัดการความห่วงกังวลและความต้องการของตนเองได้แก่ การจัดการกับความห่วงกังวล การแสวงหาวิธีการให้บุตรปลอดภัย การเตรียมตัวสำหรับเหตุการณ์ไม่คาดคิด และการสร้างสัมพันธภาพกับบุตร

ผลการศึกษาครั้งนี้เพิ่มเติมความรู้ใหม่เกี่ยวกับการจะเป็นบิดาในชายไทย ซึ่งรวมถึงข้อมูลเกี่ยวกับความห่วงกังวลและความต้องการขณะที่ภรรยาตั้งครรภ์เสี่ยงสูง และกลวิธีที่ใช้ในการจัดการความห่วงกังวลและความต้องการของตนเอง ความเข้าใจอย่างดียิ่งของประสบการณ์เหล่านี้จะสามารถทำให้พยาบาล/ผดุงครรภ์และผู้ดูแลทางสุขภาพอื่นๆ ให้การช่วยเหลือและดูแลผู้ที่จะเป็นบิดาครั้งแรกขณะที่ภรรยามีภาวะเสี่ยงสูงขณะตั้งครรภ์ได้อย่างเหมาะสม

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คำสำคัญ: ผู้ที่กำลังจะเป็นบิดา ผู้ที่กำลังจะเป็นบิดาครั้งแรก ทฤษฎีพื้นฐาน การตั้งครรภ์เสี่ยง ทฤษฎีปฏิสัมพันธ์เชิงสัญลักษณ์

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A Systematic Review of Factors Influencing Social Participation of Older Adults

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Abstract: Social engagement has many benefits for health of older adults. The literature describes that personal and environmental factors may act as facilitators or obstacles for levels of social participation of older people. The objective of this systematic review was to examine social participation types most engaged among older people and to analyze factors influencing the social participation of these people. Published articles written in English from 2006 to 2016 were searched from electronic databases, including ScienceDirect, PubMed, and CINAHL databases. The keywords combination used in the search strategy were: social participation, social engagement, social activity, and factors, and aging, or older persons. Ten articles were selected for final review based on defined eligibility criteria.

The literature revealed that community-based activities were more engaged by older people than individual-based activities. In addition, factors influencing participation in social of older people were health status, and a friendly environment, whereas it was still unclear whether sociodemographic factors were correlated with participation in social of older people. The literature highlighted that more rigorous studies are needed to examine the correlation between factors and social participation of older people. Nurses need to work with others to support and educate significant people regarding friendly environments for older people so that they can engage in social activities, either community- based or individual-based.

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Introduction

Social participation has benefits for older adults in both physical health and mental wellbeing aspects. For example, older adults who engage in social activities have better self-rated health, lower mortality risk, lower rates of depression, dementia, and cognitive impairments and social participation also related to better life satisfaction, self-esteem, sense of agency, and positive affect.[1] Therefore, to age successfully, older people can be encouraged to participate in social activities in different life spheres, such as social, economic, and cultural, spiritual and civic affairs.[2-4] However, ageism and social environment can be obstacles to social participation among older persons.[5]

Previous research has reported barriers to engage in social activities of older adults, including older age, sickness, lower socioeconomic status, and ethnic minority.[6] These older adults also described experiences of obstacles to participate in social activities that they perceived as a insecurity in their neighborhood, ageism, lack of budgets, lack of self-reliance, lack of chances that support approved identities, and difficulties adjusting to aging.[6]

Many previous studies reported positive benefits of social participation on health among general population.[7-9] However, it is still questionable whether social participation is related to health among older people. Interestingly, a previous study[10] reported that health condition seemed to be affected by social participation rather than the outcome of social engagement on health. This means healthy older people are more like to engage in social events and get benefits from this engagement.[11] Previous studies provide an important issue that health status is correlated to social engagement of older people in different activities. The challenge is that how to make it possible if it is their preference to engage in social activities when they have some health limitations.[12]

In 2008, one systematic review reported that both personal and environmental factors were correlated with the social engagement of older people.[13] However, the authors also reported that some personal factors such as gender, were not conclusive and few studies have examined the correlation between social engagement and environmental factors. Therefore, to update knowledge on this issue, a systematic review was conducted to review recent literature that might provide evidence of the social participation of older people. The research questions were: What types of social participation are most engaged by older people? Do personal and environmental factors influence participation in social activities of older people? Identifying most engaged social participation types and the factors correlated with social participation may help in the future design and delivery interventions to gain the rate of social involvement of these older people.

Methods

Data Sources

The Preferred Reporting for Systematic Reviews (PRISMA) was performed to report this systematic review.[14] The review from 2006-2016 was performed using the ScienceDirect, PubMed, and CINAHL databases. The keywords combination used in the search strategy were as follows: (social participation* [tiab] OR social engagement *[tiab] OR social activity * [tiab] AND factors*[tiab] AND elders*[tiab] OR elderly* [tiab] OR aging*[tiab] OR older persons*[tiab]). In addition, relevant bibliographies were scanned, and additional relevant references added. The Internet was searched for grey literature.

Selection of Studies

The search for published papers from the three databases was undertaken in January 2017 on those published from 2006 to 2016. Study selection was undertaken in two phases. Firstly, each researcher independently screened the relevance of the titles and abstracts of any retrieved abstracts and titles. Studies that were not retrievable were excluded. The following were the inclusion criteria applied to the studies examined: 1) samples were older people aged ≥60 years; 2) research objective was to examine the correlation between influencing factors and social participation; 3) research design was quantitative, using a cross-sectional or longitudinal design; and 4) they were written in English. Qualitative studies, case studies, literature reviews, and expert opinion papers were excluded for the review. Non-refereed articles, abstract, and dissertations were also excluded. Secondly, when the papers appeared to meet the inclusion criteria, we obtained the full text and two researchers dependently screened them. If there was disagreement, this would be resolved by consensus with a third researcher.

Data extraction

All studies were extracted into a form created by the researchers; one researcher extracted the data and these were checked by another. Disagreement was resolved by a third researcher to ensure appropriate and accurate representation of the material.

Quality assessment

The quality of the studies was evaluated by using the Methodological Index for Non-Randomized Studies (MINORS) developed by a group of surgeons.[15] The tools contain eight methodological items for non-randomized studies: a clear stated objective, inclusion criteria, data collection, appropriate aim of study, unbiased assessment, appropriate follow-up period, loss of follow-up less than 5%, and sample size. The scores of items are from 0 to 16 for non-randomized studies (see the last column of Table 1).

Results

Searching from the ScienceDirect, PubMed, and CINAHL databases, we initially found 639 articles. Then we further searched from the reference lists of those included studies and found 5 related-articles to be included in the screening process. About 371 articles were excluded as they did not specifically include information on factors related to social participation, or did not include older adults, or duplication. The inclusion and exclusion criteria were applied to 273 articles. After screening, 269 articles were excluded due to unrelated to social participation in elder people. Of the 24 articles that underwent further detailed inspection, 14 articles were excluded as they just reported the study protocols, not the results of the study, samples aged <60 years or systematic review articles. The remaining ten papers were entered in the final round for reviewing (Fig. 1). The data were extracted and synthesized into a summary table (Table 1).

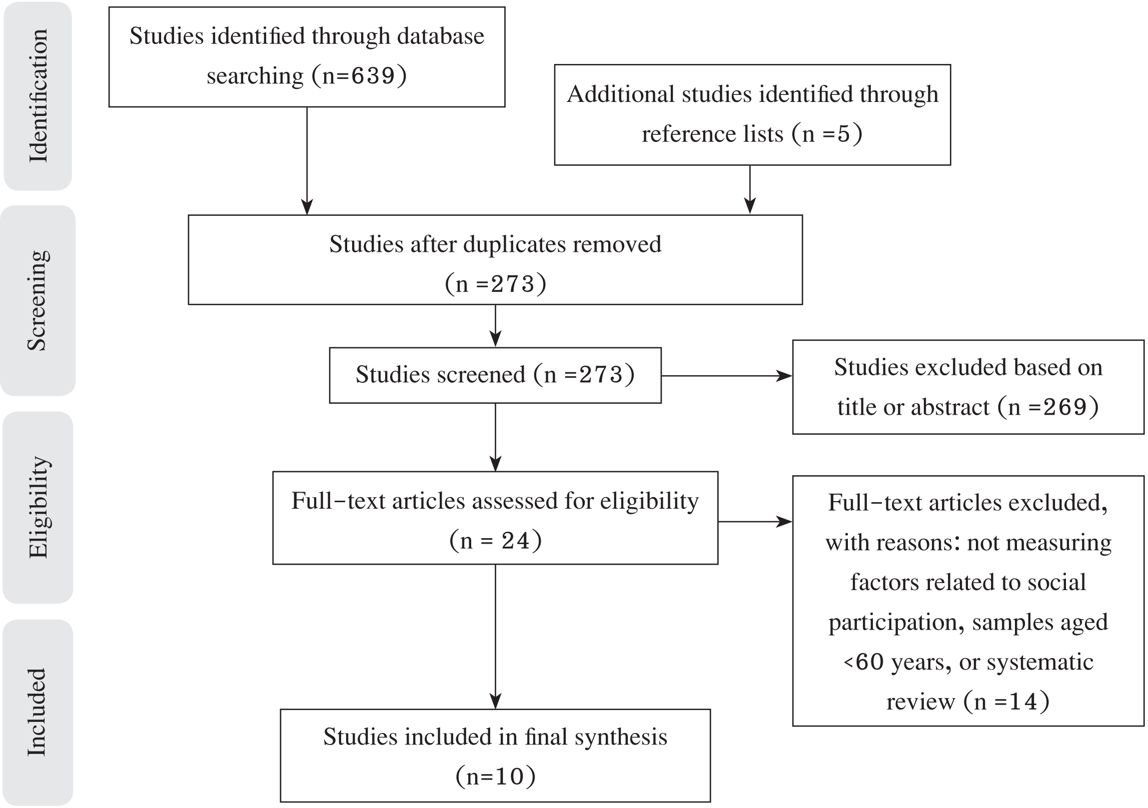

Figure 1 Literature review flow diagram

Table 1 Summary of Patterns and Factors Affecting Social Participation in Older People

Study	Design and Sample	Selected Factors	Social participation Patterns	Results of the Study	Quality Ranking
Community-based activity types					
VanBeek et al.[16]	A cross-sectional study with 502 residents aged ≥60 years, mean age = 83.6 years with dementia living in long-term care units in the Netherlands	Depressive symptoms age, gender, having a partner, physical and cognitive functioning.	Residents of psychogeriatric units in nursing homes had low social engagement.	Social engagement and depressive symptoms correlated moderately on the level of the units. Social engagement of residents was related to physical and cognitive functioning. Gender and age were not significantly related to social engagement. Residents who were more dependent on others in their physical functioning had less social engagement.	12
Buffel et al.[17]	A cross-sectional study with 1,877 older adults aged ≥60 years, mean age = 70.5 years living in medium - sized cities in Flanders, Belgium	Neighborhood perceptions: Neighborhood services and amenities, Neighborhood user-friendliness, Opportunities for 'agency' in the neighborhood, The social dimension of the neighborhood, and Socio-demographic and health variables: age, gender, marital status, education, monthly household income, length of residence, and physical and mental health.	Formal participation, defined as a voluntary commitment to community organizations on a regular basis and social activity, defined as participation in social activities that connect individuals to others, involving less formal engagement. Walking or biking, visiting a restaurant/pub/cafe´ and shopping emerged as the activities in which respondents most frequently engage.	Neighborhood involvement, frequent contact with neighbors and the availability of activities for older people predicted the social participation of older people.	10
Rodríguez-Galán & Falcón[18]	A cross-sectional study with 1,033 Hispanics aged ≥60 years, mean age = 70.61 years within counties in Massachusetts, USA.	Ethnicity, socio-demographics, and health-related variables.	Patterns of social activities participation were 1) children and relative active, such as getting together with any relatives; 2) friends and activities, such as doing volunteer work or going to church or temple; 3) senior services active, such as attending a senior center or eating in meals programs for elders.	Hispanic ethnicity and education are positively associated with being more engaged in activities with children and relatives, whereas being male and especially a male living alone is inversely associated with this pattern. In addition, being friends and activities active shows a positive association with education, the participant living alone, and experiencing more language.	11
Ponce et al.[19]	A descriptive and explanatory study with 31,428 older adults aged ≥60 years, living in these households.	Sociodemographic variables, living conditions, and religion	Four settings as sources of social participation: home-based; rural community based; social policy programs; and religious.	Social participation increased with advancing age and then declined after the age of 80. Family social capital is a major determinant of social participation of older adults,	10

Table 1 Summary of Patterns and Factors Affecting Social Participation in Older People (Cont.)

Study	Design and Sample	Selected Factors	Social participation Patterns	Results of the Study	Quality Ranking
	(mean age was unavailable)			who were significantly more likely to participate when other members of the household were also involved in social activities.	
Willie-Tyndale et al.[20]	A cross-sectional survey with 2,943 older adults aged ≥60 years in Jamaica. (mean age unavailable)	Socio-demographic status and health status	63% of older adults attended religious services and 60% were visited by friends at least once per month in the 12 months preceding the survey.	Age was not independently associated with social participation. Persons with post-secondary level education were twice as likely as those with primary education or less, to be visited by friends and to attend meetings of formal organizations. Men, persons not in union, and those with less functional independence had reduced odds of attending meetings of formal organizations. Persons who received an income through livestock/farming were more likely to visit or be visited by friends.	10
Asadollah et al.[21]	A cross-sectional study with 768 urban and rural elders aged ≥60 years in Iran (mean age was unavailable)	Gender, education, ethnicity, socioeconomic status, health status	Societal membership	Social participation was significantly related with high literacy, ethnicity, living with children, being female, the growth of welfare, having a chronic disease such as a respiratory disorder, social alienation, cost of participation, reduction in benefits of participation, and growth of their child's income.	12
Individual-based activities type					
Minhat & Amin, 2012[22]	A cross-sectional study with 268 persons aged ≥60 years, mean age = 67.65 years from eight health clinics in the state of Selangor.	Perceived social support	Four categories, namely recreational (physical), cognitive, social, and productive activity. Overall, the most frequently done daily activities were having conversations while relaxing, watching television, and reading. The least common activities were playing golf, performing musical instruments, playing sports and playing cards, mahjong and others.	Social support received from friends was found to be the main predictor of leisure participation involving all categories of activities.	12

Table 1 Summary of Patterns and Factors Affecting Social Participation in Older People (Cont.)

Study	Design and Sample	Selected Factors	Social participation Patterns	Results of the Study	Quality Ranking
Kimura et al.[23]	A cross-sectional survey of 86 elders aged ≥60 years, ranging from 65 to 84 years living in disability dwellings in Fukushima City, Fukushima Prefecture, Japan. (mean age was unavailable)	Demographic variables (sex, age structure, household composition, years of residence in each district, years of education, paid employment, and livelihood status), disability status, physical factors, psychological factors, psychological independence, and social factors.	Socially-related activities include participation in community events such as local festivals, neighborhood or residents' association activity, golden age club activity, group activities such as hobby groups, activity to show special skills, and the sharing of experiences with other people.	Self-rated health and psychological independence were significantly associated with social engagement in the disabled elderly.	11
Kang[24]	A descriptive, correlational design. A total of 153 older adults with dementia aged ≥60 years, mean age = 80 years living in Iowa, USA.	Cognitive and physical functions, and depression and behavioral symptoms. Demographic data, of age, gender, marital status, ethnicity, education, length of stay, and psychotropic medications.		No significant relationship was found between demographic characteristics and social engagement. There were significant negative correlations between social engagement and cognitive impairment, activities of daily living impairment, depression, and vision.	12
Serrat et al.[25]	A cross-sectional survey of 2,535 Spanish older persons aged ≥60 years. (mean age was unavailable)	Socioeconomic resources and participation in other types of active aging activity (participation in leisure, learning, and productive activities). Educational level, leisure activities, learning activities	Attending shows, doing sports, and attending a recreational center	Only volunteering in the case of productive activities was found to be associated with membership in political organizations. Results provide partial support for the socioeconomic resources model. Engagement in leisure activities, learning activities, and volunteering might have an enhancing effect on membership in political organizations.	10

Methods used in the selected studies

All ten selected studies were cross-sectional studies. The sample size of the studies varied from 86 to 31,428 participants. Most participants lived in the community, such as in their own homes. One study was conducted with participants living in long-term care[16] and another with those attending health clinics. [22]

Social participation types of older people

Based on types of social participation patterns as grouped by Levasseur et al.[26] and the available information on social participation types in each study, the results of eight selected studies showed that community-based activities, for example, a local event, being a volunteer, senior center, or religious activities were the types of social participation most engaged by older people.[16-21] Next followed individual-based activities, such as a hobby, or a neighborhood relationship). [22-25]

Variables correlated to social involvement of older people

The researchers identified three categories of factors correlated to social engagement of older people, including their demographic factors, friendly environment factors, and health status.

1) Demographic factors

The most commonly investigated demographic factors were gender, age, and education level. Four previous studies reported that gender was not significantly related to social participation of older people.[16,20,21,24] However, the results of one study[18] demonstrated that being a man and a man living alone were inversely correlated with social participation.

Regarding the age factor, two previous studies[20, 24] reported that age was not exclusively related with social involvement of older adults. However, another study[19] reported that social engagement gained with old age and would be dropped out after 80 years as involving in social activities was an important resource of healthy aging.

For educational level, one previous study[24] reported that no significant correlation was reported between education and social participation of older adults. On the other hand, two studies reported that education was positively correlated with the social engagement of older people.[18, 20]

In terms of socioeconomic status, two selected studies reported that socioeconomic status of older people and their child's income might be related to social engagement.[21, 25]

Friendly environment factors

Of the 10 selected studies, 3 reported that friendly environment factors such as neighbor relationship, family involvement, capital conditions were significantly correlated with the social engagement of older people.[17, 19, 22]

In terms of neighbor relationships, one study[17] reported that neighborhood involvement and frequent contact with neighbors were more likely to predict the social participation of older people. Similarly, one study[22] showed that social support from friends was the main influencing factor of older adults for participation in social activities (i.e.: recreation or productive activity). More interestingly, not only good support from outside the home was related to older people's decisions about engaging in social activity, but also from inside the home in their relationships with or support from family members of older people.[19]

2) Health status of older people

Four studies investigated the correlation between health and social engagement of older people and found that participants with health problems, such as having a chronic respiratory disease, physical and cognitive dysfunction, or psychological dependence, were more like to reduce their social participation.[16, 21, 23, 24] Firstly, one study[21] reported that older persons having chronic disease were less likely to engage in social activities. Similarly, another study[16] reported that participants who needed help from other people were less likely to involve in social activities. In terms of mental health status, two previous studies [23-24] reported that older people with cognitive impairment, depression, or psychological dependent were less likely to be involved in social activities.

Discussion

This systematic review examined social participation patterns engaged by older people and factors related to participation in social activities of these group of people. Regarding social participation types, the literature reported that community-based (e.g. religious, volunteer, community event) activities were the types of social participation most engaged by older people, followed by individual-based (e.g. hobby, neighborhood relationship). Similarly, one previous study,[27] which distinguished three types of participation, collective, productive, and political participation, reported that participation in collective activities was highest for older adults, followed by participation in productive and political activities. The authors explained that participation in productive activities might give older persons a feeling of being recognized, of personal positive self-image, and of self-confidence.

Previously published studies found that being male, being younger, and having higher education were more likely to be positively correlated with the social involvement of older people.[13, 18,20] However, some studies reported no relationship between these variables. For example, one systematic review of social participation in older people reported that the most personal factors influencing this were age, education, working status, and gender.[13]

Friendly environment factors both inside and outside the household of older people were significantly correlated with their social participation. This means that living in friendly environment areas enhances older people to participate in social activities. It can be explained by the fact that participating in formal or informal social activities of older people rely not only on activity available, but also on having accessible transportation and helpful facilities for activities.[28] Similarly, one study[29] reported that social support and social attachment are influencing factors for social engagement of older people as these factors can lead to positive perceptions with the community support. The findings of this literature may concur with the concept of an "elder-friendly community", that includes accessible vehicles, information services, leisure activities, social networks, volunteer opportunities, worship places, and respects.[29]

The literature also revealed that participants with health status problems, either physical or mental, were more like to reduce social participation. This finding is consistent with a study[31] reporting that the leisure activity participation of older adults with dementia was more likely to decrease because of health problems, particularly cognitive functioning, and inability to connect with other people outside the residential areas. Similarly, one previous study[32] reported that older adults with cognitive impairment participated less than those with good cognition functioning.

Conclusion

This systematic review highlighted that community-based activities were the most common type of social participation engaged by older people, followed by individual-based activities. Environment factors were correlated with this social participation. However, the correlation between sociodemographic factors and social engagement of older people is still unclear.

Implications for nursing practice

Since social participation in late life either communities-based or individual-based activities is likely to be correlated to both physical and mental health benefits, nurses and other health care providers should encourage older people to undertake such activities by improving the environments to increase the accessibility rate of these people. Researchers also ought to conduct rigorous research to foster appropriate activities or programs for them. Moreover, whether sociodemographic factors of older people can influence their social participation or not is still unclear. Therefore, the empirical findings of how gender, age, and education level relate to the social engagement of older people should be explored in future. The limitation of these papers reviewed was that all studies were predominantly cross-sectional designs and based on small sample sizes. So future research with longitudinal study designs with larger samples is needed. In addition, most selected studies were conducted in community settings. As a result, the generalizability of the findings to older adults living in residential long-term facilities or those attending health clinics is limited. Future research in long-term care units or in clinical settings is needed, and this can be undertaken by nurses. Finally, all papers were retrieved from only three databases. As a result, incomplete retrieval may have occurred.

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Conflicts of interest statement

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

1. Adams KB, Leibbrandt S, Moon H. A critical review of the literature on social and leisure activity and wellbeing in later life. Ageing & Society. 2011; 31(4): 683-712.
2. Rowe JW, Kahn RL. Successful aging. Gerontologist. 1997; 37(4): 433-40.
3. McLaughlin SJ, Connell CM, Heeringa SG, Li LW, Roberts JS. Successful aging in the United States: Prevalence estimates from a national sample of older adults. J Gerontol B Psychol Sci Soc Sci. 2010; 65(2): 216-26.
4. World Health Organization. Knowledge translation framework for ageing and health. [cited 23 Feb 2018]; Available from http://www.who.int/ageing/publications/knowledge_translation.pdf?ua=1
5. Cachadinha C, Pedro J B, Fialho JC. Social participation of community living older persons: Importance, determinants, and opportunities. [cited 23 Feb 2018]; Available from https://repository.tudelft.nl/islandora/object/uuid%3A43c6504b-4cbe-4f01-8918-0b428cebbfbb
6. Goll JC, Charlesworth G, Scior K, Stott J. Barriers to social participation among lonely older adults: The influence of social fears and identity. PLoS ONE. 2015; 10(2): e0116664. [cited 23 Feb 2018]; Available from http://dx.plos.org/10.1371/journal.pone.0116664
7. Folland S. Does "community social capital" contribute to population health? Soc Sci Med. 2007; 64(11): 2342-54.
8. D'Hombres B, Rocco L, Suhrcke M, McKee M. Does social capital determine health? Evidence from eight transition countries. Health Econ. 2010; 19(1): 56-74.
9. Ronconi L, Brown TT, Scheffler RM. Social capital and self-rated health in Argentina. Health Econ. 2012; 21(2): 201-8.
10. Sirven N, Debrand T. Promoting social participation for healthy ageing an international comparison of Europeans aged fifty and over. [update 2008; cited 23 Feb 2018]; Available from http://www.share- project.org/fileadmin/pdf_publications/S-/Sirven_Debrand_08.pdf.
11. Leone T, Hessel P. The effect of social participation on the subjective and objective health status of the over-fifties: Evidence from SHARE. Ageing and Society. 2016; 36(5): 968-87.
12. Galenkamp H, Deeg DJ H. Increasing social participation of older people: Are there different barriers for those in poor health? Introduction to the special section. Eur J Ageing. 2016; 13(2): 87-90.
13. Dahan-Oliel N, Gelinas I, Mazer B. Social participation in the elderly: What does the literature tell us? Crit Rev Phys Rehabil Med. 2008; 20(2): 159-76.
14. Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. PLoS Med. 2009: e1000097. [cited 23 Feb 2018]; Available from http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1000097
15. Slim K, Nini E, Forestier D, Kwiatkowski F, Panis Y, Chippon J. Methodological index for non-randomized studies (MINORS): Development and validation of a new instrument. ANZ J Surg. 2003; 73: 712-16.
16. Van Beek A, Frijters D, Wagner C, Groenewegen PP, Ribbe MW. Social engagement and depressive symptoms of elderly residents with dementia: A cross-sectional study of 37 long-term care units. Inter Psychogeriatrics. 2011; 23(4): 625-33.
17. Buffel T, Donder LD, Phillipson C, Dury S, de Witte N, Verte D. Social participation among older adults living in medium-sized cities in Belgium: The role of neighbourhood perceptions. Health Promot Int. 2014; 29(4): 655-88.
18. Rodríguez-Galán MB, Falcón LM. Patterns of social activity engagement among older Hispanics and their relationship to sociodemographic and health variables. Act Adapt Aging. 2010; 34(4): 251-75.
19. Ponce MSH, Rosas RPE, Lorca MBF. Social capital, social participation and life satisfaction among Chilean older adults. Rev Saúde Pública. 2014; 48(5): 739-49.
20. Willie-Tyndale D, Holder-Nevins D, Mitchell-Fearon K, James K, Laws H, Waldron NK, Eldemire-Shearer D. Participation in social activities and the association with socio-demographic and health-related factors among community-dwelling older adults in Jamaica. J Cross Cult Gerontol. 2016; 31(4): 427-47.

21. Asadollah A, Saberi LF, Tabrizi AM, Faraji N. Do public health and social participation matter for the elderly? An analysis of an aging community in Khuzistan province, Iran. Can Soc Sci. 2011; 7(6): 240-4.
22. Minhat H, Amin R. Social support and leisure participation of elderly in Malaysia. Internet J Geriatrics Gerontol. 2012; 7(1). [cited 23 Feb 2018]; Available from http://print.ispub.com/api/0/ispub-article/13849.
23. Kimura M, Yamazaki S, Haga H, Yasumura S. The prevalence of social engagement in the disabled elderly and related factors. ISRN Geriatrics. 2013. [cited 23 Feb 2018]; Available from https://www.hindawi.com/journals/isrn/2013/709823/
24. Kang H. Correlates of social engagement in nursing home residents with dementia. Asian Nurs Res. 2012; 6(2): 75-81.
25. Serrat R, Villar F, Celdrán M. Factors associated with Spanish older people's membership in political organizations: The role of active aging activities. Euro J Ageing. 2015; 12(3): 239-47.
26. Levasseur M, Richard L, Gauvin L, Raymond É. Inventory and analysis of definitions of social participation found in the aging literature: a proposed taxonomy of social activities. Soc Sci Med. 2010; 71(12): 2141-49.
27. Bukov A, Maas I, Lampert T. Social participation in very old age: Cross-sectional and longitudinal findings from BASE. J Gerontol B Psychol Sci Soc Sci. 2002; 57(6): 510-7.
28. World Health Organization. Global age-friendly cities: A guide; 2007 [cited 23 Feb 2018]; Available from: http://www.who.int/ageing/age_friendly_cities_guide/en/
29. Douglas H, Georgiou A, Westbrook J. Social participation as an indicator of successful aging: An overview of concepts and their associations with health. Aust Health Rev. 2016; 41(4): 455-62.
30. Plouffe L, Kalache A. Towards global age-friendly cities: Determining urban features that promote active aging. J Urban Health. 2010; 87(5): 733-9.
31. Fernández-Mayoralas G, Rojo-Pérez F, Martínez-Martín P, Prieto-Flores ME, Rodríguez-Blázquez C, Martín-García S., et al. Active ageing and quality of life: Factors associated with participation in leisure activities among institutionalized older adults, with and without dementia. Aging Ment Health. 2015;19(11):1031-41.
32. Hughes TF, Flatt JD, Fu B, Chang CH, Ganguli M. Engagement in social activities and progression from mild to severe cognitive impairment: The MYHAT study. Inter Psychogeriatr. 2013; 25(4): 587-95.

การสังเคราะห์งานวิจัยอย่างเป็นระบบเกี่ยวกับปัจจัยที่มีผลต่อการเข้าร่วมกิจกรรมทางสังคมของผู้สูงอายุ

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บทคัดย่อ: การเข้าร่วมกิจกรรมทางสังคมเป็นประโยชน์ต่อสุขภาพของผู้สูงอายุ การทบทวนเอกสารพบว่าปัจจัย ส่วนบุคคลและปัจจัยด้านสิ่งแวดล้อมอาจเป็นปัจจัยสนับสนุนหรืออุปสรรคต่อการเข้าร่วมกิจกรรมทางสังคมของผู้สูงอายุ การสังเคราะห์งานวิจัยครั้งนี้มีวัตถุประสงค์เพื่อค้นหาประเภทของกิจกรรมทางสังคมที่ผู้สูงอายุเข้าร่วมมากที่สุดและปัจจัยที่กระตุ้นการเข้ากิจกรรมทางสังคมของผู้สูงอายุ งานวิจัยที่ได้รับการตีพิมพ์เป็นภาษาอังกฤษจากปี พ.ศ. 2549 – 2559 จากฐานข้อมูลต่างๆ ได้แก่ Science Direct, Pub Med, และ CINAHLได้รับการสืบค้น โดยใช้คำสำคัญในการสืบค้น คือ การเข้าร่วมกิจกรรมทางสังคม การมีส่วนร่วมในกิจกรรมทางสังคม กิจกรรมทางสังคม และปัจจัยและความสูงอายุและผู้สูงอายุ รายงานการวิจัยจำนวน 10 เรื่องผ่านเกณฑ์การคัดเข้าเพื่อการทบทวน

ผลการทบทวนพบว่าผู้สูงอายุชอบเข้าร่วมกิจกรรมทางสังคมในลักษณะการจัดโดยชุมชนมากกว่ากิจกรรมทางสังคมรายบุคคล นอกจากนี้ยังพบว่าปัจจัยที่ส่งเสริมให้ผู้สูงอายุเข้าร่วมกิจกรรมทางสังคมได้แก่ภาวะสุขภาพและสิ่งแวดล้อมที่เป็นมิตร ในขณะเดียวกันยังไม่สามารถระบุได้ชัดเจนว่าปัจจัยส่วนบุคคลมีส่วนเกี่ยวข้องกับการเข้าร่วม กิจกรรมทางสังคมหรือไม่ ดังนั้นการทบทวนงานวิจัยครั้งนี้ชี้ให้เห็นความจำเป็นของการทำวิจัยที่มีการออกแบบอย่างมีประสิทธิภาพเพื่อศึกษาความสัมพันธ์ระหว่างปัจจัยต่างๆกับการเข้าร่วมกิจกรรมทางสังคมของผู้สูงอายุ และพยาบาลควรจัดสิ่งแวดล้อมที่เป็นมิตรเพื่อส่งเสริมให้ผู้สูงอายุเข้าร่วมกิจกรรมทางสังคมให้มากขึ้นไม่ว่าจะเป็นกิจกรรมในรูปแบบที่จัดโดยชุมชนหรือรายบุคคล

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An Ethnographic Study of Traditional Postpartum Beliefs and Practices among Chinese Women

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Abstract: In many Asian societies, traditional postpartum practices are believed to be vital to the health of women and babies. Deep cultural and social meanings are attached to practices related to behaviors, activities, foods, hygiene, and infant care with variance by regions. Previous studies have demonstrated diverse interpretations of the traditional postpartum beliefs and practices by local communities. In the rural area of Jiujiang Jiangxi Province, China, postpartum women's beliefs and practices have not been documented. This paper is part of an ethnographic study aimed to describe the traditional postpartum beliefs and practices among women in the sociocultural context of the rural area of Jiujiang, Jiangxi province. The villages of two townships of Maying and Zhangqing in Jiujiang City, were the settings for the study. Data collection was from January 2017 to July 2017. Participant observation in the rural area context and in-depth interviews were conducted with 18 postpartum women as key informants. A six-step qualitative data analysis method was used. Three themes emerged from the traditional postpartum practices - *zuo fang* (sitting in room): gaining *yin-yang* (shady-sunny) balance, preventing *'xie'* (pathogenic factor) entering the body, and enhancing breastmilk production. Variations of the traditional postpartum beliefs and practices were influenced by the local sociocultural context. Knowledge of the cultural importance of traditional postpartum beliefs and practices of rural women is required for nurses to provide culturally sensitive postpartum nursing care.

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Introduction

Childbirth takes place in a cultural context that is shaped by the perceptions and practices of that culture.[1,2] Therefore, childbirth and the postpartum period are constructed within the behavioral, social and experiential content of cultural values.[3,4] Many traditional beliefs and practices during the postpartum period are adhered to by the woman and her family to ensure the health and well-being of herself and the baby.[5,6,7,8,9,10,11,12,13] Moreover, the rituals of the tradition following childbirth signify the transition of the woman's life stage from childbearing to preparing for their new status as mothers.[3,5]

In the Chinese culture, the customs of the traditional postpartum practices can be dated from the Song Dynasty (960-1279 A.D).[13] However the conceptual origin may have begun more than 2000 years ago.[14] Nowadays, despite substantial social changes and the enormous impacts on health coming from western medicine, Chinese women still prefer to observe the traditional postpartum practices. A cross-sectional study found that most of 2100 Chinese mothers in Hubei, China, attended education courses regarding well-balanced nutrition and health-related behavior in the postpartum period but did not follow the instructions.[15] A randomized control study in China also found that most women did not change their behaviors after attending dietary and health behaviors education program.[16] Existing literature has pointed to the significance of traditional postpartum practices among Chinese women living in different regions of China and even in western countries.[3,4,17,18,19] A rich cultural diversity exists in the country. Therefore, it is imperative for nurses to know well about the traditional postpartum beliefs and practices in the different sociocultural contexts to provide culturally sensitive postnatal care for women. The rural areas of Jiangxi China have not been the focus of a study from the perspective of women in the 21st century who are living in a modern society strongly influenced by ancient traditions, beliefs and practices, so this study focused on those rural areas.

Review of Literature

Traditional postpartum practices are a series of behaviors undertaken by women after giving birth based on their own cultural beliefs in their living context.[9,20,21] In many Asian cultures women often adhere to traditional postpartum practices according to their cultures.[20,22] In China the *ying-yang* theory is the basis of most of postpartum practices.[22,23,24] According to this theory, the balance of *yin* and *yang* or 'cold' and 'hot' called by lay people, is believed to be essential for maintaining health, while the *yin-yang* imbalance is believed to cause diseases.[25] Women's heat is depleted by losing blood during childbirth that results in a state of extreme *yin* of the body after childbirth.[23] The destroyed balance of *yin-yang* in the body makes the woman vulnerable to various diseases. To restore the balance of *yin-yang/* 'cold' and 'hot' after giving birth further to promote health and prevent diseases, women have to observe traditional postpartum practices in these societies.[20, 23]

Many Asian countries have beliefs about postpartum recovery and generate similar traditional postpartum customs. The traditions include rest at home for a defined period, and restricted activity, keeping warm, hygiene, and dietary practices in such societies.[4,5,6,8,10,11,19,22] Also, considerable variations of the details of traditional postpartum practices are carried out cross-culturally in each aspect in different societies. In China traditional postpartum beliefs and practices have been adapted to fit different environments, and postpartum women choose to practice and select which aspects to practice in their sociocultural context.[26,27] Previous studies among Chinese women demonstrated that postpartum women who had a low level education,[27,28] low socioeconomic status,[15] adequate social support,[29] living in a rural area,[8] and lack of postpartum nursing care including education,[30] were more likely to observe traditional postpartum practices. Among Chinese women, traditional postpartum practices are observed differently with various reasons in their living context such as Hong Kong, Taiwan and other regions of China.[4,19,31,32] Moreover, with the development of modern society, the adjustments of the traditional postpartum practices have been examined among Chinese women in both in Hong Kong and Taiwan.[3,27] China, particularly rural areas, has undergone fast urbanization in the last decades. However, what traditional postpartum beliefs and practices are adhered to is unknown from the perspective of Chinese women living in the rural area of Jiangxi.

Study Aim

This study identified the traditional postpartum beliefs and present pattern of postpartum practices among women living in the context of the rural area of Jiujiang Jiangxi Province, China.

Setting: Data were collected between January and July 2017 in the rural area of two townships of Maying and Zhangqing in Hukou County, Jiujiang City, Jiangxi Province. Hukou is a county with more than 1000 years history with its own local language. The population is about 300,000 with more than 220,000 living in the rural area. This area was chosen as the study site, as women there observed traditional postpartum practices and had transportation access to the villages.

Participants: Key informants were womem who were: older than 18 years, giving birth to a healthy baby within previous 30 days, living with husband, and observing traditional postpartum practices. The exclusion criteria were those having either obstetric or medical complications or severe problems with their babies. In our larger study general informants were mothers or mothers-in-law of the postpartum women, older women and traditional midwives in the villages, traditional Chinese medicine doctors, and nurses, however only data from the postpartum women is presented here. Purposive sampling was used.[34]

Ethical Considerations

Study approval was obtained from the Research Ethics Committee, Faculty of Nursing, Chiang Mai University, approval number EXP-071-2016. Before data collection, each potential participant had verbal and written explanations about the study objective and procedures, and informed that they had the right to refuse, or withdraw from the study at any time with no adverse effect. All informants signed an informed consent that included permission to record interviews. The principal investigator (PI) did the record keeping. Confidentiality and anonymity were assured and maintained throughout the study.

Data Collection

Data were obtained in the field by the PI, who had background knowledge and experiences of the cultural group, through participant observation and in-depth interviews. The postpartum women were accessed and recruited in the obstetrics wards in two county-level hospitals, the Hukou Maternity and Child Hospital and the Hukou People's Hospital, with the help of the directors, head doctors, and head nurses. Two or three days following the women's discharge to home, the PI contacted them to observe their activities such as rest, eating, and other daily activities during postpartum period. Observations were conducted 3-5 times at different times of a day within the month. Each visit was at least two hours. Meanwhile, field notes were written for each observation to record what was heard and experienced, including the appearance of the environment, the informant's attitude, behaviors, and interaction with family members, the daily process of activities as they occurred chronologically, special events, and dialogue. At the end of the month following childbirth, in-depth interviews were conducted in their home at their convenience, asking questions like *What do you think about traditional postpartum practices?*; *What did you practice during the postpartum period?*; *Why did you do each activity?* and *Where did you learn it?*. Such questions helped to gain insights of the traditional postpartum beliefs and practices from the perspective of the postpartum women. The interviews with other informants also started with *What do you* *think about traditional postpartum practices?* and followed with questions like: *What did you tell your daughter/daughter-in-law about traditional postpartum practices?* and, for the TCM doctor: *What do you prescribe women do as traditional postpartum practices?* Interviews were conducted once or twice for each participant with a duration of 60-90 minutes until data saturation occurred. A reflexive journal was also maintained to keep the researcher sensitive and non-judgmental to the data collected.

Data Analysis

A classical ethnographic method was used in this study, characterized by a cyclic iterative process of participant observation, interviewing and interpretation in the natural setting studied.[35] Thematic analysis was used to identify, analyze, and report patterns of the traditional postpartum beliefs and practices within data in this ethnographic research.[36] Recordings of interviews were transcribed for analysis. After becoming familiar with the data set, initial codes were used for analysis and listed. For example the daily dietary practices of *eating chicken soup, drinking brown sugar water, eating noodles*, and *eating eggs* were grouped into a potential subtheme of *eating hot food to improve yang*. Similarly, other subthemes were searched such as *rest to restore body vital energy* and *dietary precautions to maintain the yin-yang balance of the baby*. All these practices were adhered to because of the belief of *gaining yin-yang balance*, which became a study theme. Similarly, other subthemes and themes, and the relationships between these were analysed to describe the practices and beliefs of women during the postpartum period.

Trustworthiness

Trustworthiness was provided by prolonged engagement in the field, maintaining field notes and a reflexive journal, peer debriefing and a form of data triangulation.[37] The PI visited postpartum women and their family 3-5 times, at least 2 hours each visit, in their natural settings. The visits were arranged at different times of a day and a month after childbirth to gain various perspectives for the data. Rapport and trust with the informants and the PI fostered vibrant, detailed responses to achieve a deep understanding of the traditional practices and the settings. Field notes and a reflexive journal were maintained to describe the research process in detail and the PI's role. She also researcher regularly detached herself from the settings and communicated with the advisory committee about her thinking and questions encountered. Each step of the research process was appraised by the advisory committee to examine the data collection process, to check the accuracy of coding in data analysis, and to confirm the consistency of the inferences. Data was collected through different methods and different groups of participants.

Findings

In total, 18 postpartum women were research informants and their demographic characteristics are presented in **Table 1**. Through the observations and the descriptions of the informants, the sociocultural context in which the postpartum women lived was described.

Characteristics of the informants

Among the 18 women (**Table 1**), the majority (61.1%) were aged between 20 and 30. All were married. Most (61.1%) had secondary school education. Only a few (16.7%) had a college-level education and 22.2% had only primary school education. The majority (72.2%) gave birth to the second child compared to 27.8% who gave birth to the first child. More than half (55.6%) gave birth by Cesarean section. Before giving birth to this baby, most of them (77.8%) had temporary jobs outside the villages. The majority of postpartum women (94.4%) lived in the extended family, among whom most (88.2%) lived in their husband's family, and a few (11.1%) lived with their own parents' family. Only one (5.6%) was in a nuclear family living situation.

Table 1 Demographics of postpartum women (n=18)

Characteristics	Number (%)
Age (Years)	
20-30	11 (61.1)
31-40	7 (38.9)
Marital status	
Married	18 (100)
Number of children	
1	5 (27.8)
2	13 (72.2)
Level of education	
Primary	4 (22.2)
Secondary	11 (61.1)
College	3 (16.7)
Work status before childbirth	
Home duties	4 (22.2)
Working	14 (77.8)
Average family monthly income (*yuan* RMB)	
< 2000	2 (11.1)
2000 - 4000	7 (38.9)
>4000	9 (50)
Family pattern	
Nuclear family	1 (5.6)
Extended family	17 (94.4)
Living with own parents	2 (11.8)
Living with husband's parents	15 (88.2)
Delivery mode	
Vaginal	8 (44.4)
Cesarean section	10 (55.6)

Sociocultural context of traditional postpartum practices

With the fast urbanization development, the living environment of postpartum women in the villages is experiencing massive changes. In the past six to seven years, the government spent money for them to rebuild their villages and houses with improved standards. As they do not rely on the farm only, before childbirth, most postpartum women and their husband worked in the cities outside the villages. Also, some of them did e-business online without leaving home. The living standard of the family has significantly improved in recent years.

Nowadays, women have many ways to access different postpartum practices besides the ancient traditions. For example, in this study, all the recruited postpartum women gave birth in a county level hospital. They had a legitimate chance to know postpartum practices based on western medicine. Moreover, living in the age of information explosion, they used smartphones to communicate with others in different cultures about the postpartum practices either traditional or modern. As one woman explained *"I saw the report that women in western countries went back work 2 or 3 days after childbirth. They still have good health. They do not have the tradition 'zuo fang'. Why do we have to?"* On other hand, the local language of women in this study was nationalized today. Thus, they did not understand well by themselves about the traditional postpartum practices.

Historically and culturally, *zuo fang* (sitting in room) is the traditional postpartum practice following childbirth among women living in the rural area of Hukou Jiujiang Jiangxi. It is believed to maintain the lifelong health of postpartum women by promoting recovery, preventing and even curing diseases for the future life.

Traditional postpartum practices - zuo fang

Zuo fang (sitting in room) is a series of believed traditional postpartum practices for 30 to 40 days following childbirth. Findings of *zuo fang* from the perspective of postpartum women and the fieldwork notes are presented in **Table 2**. Three themes and 12 sub-themes are described below.

Gaining yin-yang balance

Yin originally meant 'shady', and is associated with the phenomenon of cold, winter, cloudy, rainy, and darkness; it is the symbol of femininity, inferiority, and negativity. *Yang* means 'sunny', and is associated with heat and summer, and symbolizes masculinity, externality, superiority, and positivity. Each entity, including human body, can be defined as *yin-yang* unity. On the one hand, as the opposite sides within one unity, *yin* and *yang* contend against, restrain, and repel each other. On the other hand, *yin* and *yang* are the root of each other, and mutually generate and promote themselves. The two are inseparable and integral within one unity. Moreover, the states of *yin* and *yang* are always changing. The elements are always growing or reducing, or even transforming to the opposite side under certain conditions.

Table 2 Themes and subthemes of postpartum women's traditional postpartum practices - *zuo fang*

Theme	Sub-themes
Gaining *yin-yang* balance	Rest to restore vital body energy
	Eating *hot* food to improve *yang*
	Dietary precautions to maintain the *yin-yang* balance of the baby
Preventing *xie* entering body	Staying in the room to avoid *xie (wind)*
	Hygiene practices to avoid *xie (cold)*
	Wearing more clothes to avoid *xie (wind and cold)*
	Activities caution to avoid *xie (diseases)*
	Dietary prohibition to avoid *xie (diseases)*
	Avoiding sex to avoid *xie (diseases)*
Enhancing breastmilk production	Dietary practices prescribed to improve breastmilk production
	Dietary prohibition to avoid decreased breastmilk production
	Restricting visitors to avoid decreased breastmilk production

According to traditional Chinese medicine doctors, *zuo fang* is the way to regain *yin-yang* (shady-sunny) balance for postpartum women through restoring *qi xue* (the vital energy and blood) of their body. To achieve *yin-yang* balance, rest to restore vital body energy and to eat *hot* food as two important practices of *zuo fang* was followed by postpartum women. Also, the baby's *yin-yang* balance was maintained by postpartum women's dietary precautions.

Rest to restore vital body energy

Resting well during the postpartum was one of the most frequently mentioned practices by all women. Rest is believed to restore the vital body energy (*qi*). Good rest meant to lie in bed as much as possible every day for a month after childbirth.

> *I am very weak during this period...... Sometimes when I go to the toilet and squat there, I feel my legs could not support my body, and I have to lean on something for supporting...... I always feel tired. I would like to lie in bed every day...... After more than 20 days, I feel my strength is coming back slowly...... I plan to rest for 40 days when I will get more power.* (Postpartum woman 18)

Good mood, preventing diseases like waist pain, nothing else to do, and *enjoying being taken care of* were also the reasons for lying in bed during the postpartum. However, only one woman strictly practiced bed rest as suggested. Good rest was understood and then observed differently by the women. Many believed that adequate rest meant they were not tired. There was no need to lie in bed all day if lying in bed made them tired. They could sit, walk or even do some household work such as washing the milk bottle. Furthermore, some of them believed that they had good health without the need for lying in bed all day. Besides, some women admitted that whether they could lie in bed all day depended on whether their family support was enough. Thus, many women had more bed rest during the first one to two weeks after childbirth but much less in the rest of the month. A few just slept as usual and sat in the daytime.

Eating hot food to improve yang

Eating *hot* food during *zuo fang* is vital to improving *yang* of the body to gain further *yin-yang* balance. Deciding what, when and how often to eat were a massive task for women and their family who prepared food for them. Hens are believed as the best *hot* food, which is typically made into soup and can be eaten many times every day and as many as possible during the month following childbirth.

> *I have taken eleven hens in this month, which takes about two to three days to eat one.* (Postpartum woman 11)

However, not all postpartum women could eat so many hens during the postpartum period. Some either ate several times or not at all during the whole month, as they did not have an appetite, or worried about gaining weight or aggravating baby jaundice. Moreover, pork, pork ribs, and fish were also considered as *hot* food but not the best to change the flavor. Such *hot* food was encouraged to be eaten immediately after childbirth traditionally to promote recovery.

However, some women did not start to eat such *hot* food until the second week after giving birth. Different reasons for this included following the nurse's suggestion and being too weak to digest and absorb the high fat, energy and protein food in the first week following birth. Also, noodles, eggs, and brown sugar were also the most popular *hot* foods to eat.

Dietary precautions to maintain the yin-yang balance of the baby

The baby's *yin-yang* balance could also be maintained through breastmilk by adjusting the women's diet. If they overate *hot* natured food, the baby would get too much *yang* (*shang huo* - getting fire) with the red rash on the body; by contrast, if the postpartum women were over eating *cold* food, the baby would get too much *yin* with symptoms like diarrhea.

> *I ate too much hen* (hot food) *several days ago. You see my baby is 'shang huo'* (getting fire, or suffering from excessive internal heat) *with a red rash full on his face, neck and chest.* (Postpartum woman 2)

Preventing xie entering body

In traditional Chinese medicine, factors that cause diseases and the state of different kinds of diseases are all called *xie*. It is believed as *xu chu zhao xie*, meaning when the body is weak, it is easy to let disease factors enter and thus get diseases. Postpartum women are in a state of *yin* after childbirth, called *xu* by lay people. This makes them vulnerable to any disease factors and diseases. Once women get disease during the postpartum period, it is believed that these are always incurable and last for the rest of life.

As the 'pore' of body opens after childbirth, *wind* and *cold* are believed the most common *xie* (pathogenic factor) that can be anywhere to enter the body of postpartum women to cause different kinds of diseases such immediate cold and the incurable headache and tearing of eyes in older age. To protect postpartum women from *wind* and *cold* and diseases, they had to stay in a room, observe hygiene practices and wear more clothes during *zuo fang (sitting in room)*.

Staying in the room to avoid xie (wind)

Staying in the room is the literal meaning of *zuo fang (sitting in room)* in the local language to avoid *wind* outside. The room is normally understood as the bedroom with the door and windows closed tightly. Postpartum women stayed in their bedroom for most time of each day during the postpartum period including eating inside.

> *After giving birth, the bone of the whole body is loose. Especially there is a slit in the pelvic bone...... The pore of the whole body opens. All these changes make it easy for wind to enter the body. I think it is real. Once I went outside, and the wind was small, but I still felt chilly even now is in summer. However, before childbirth, I did not have this feeling in wind. So, I avoid going out of the bedroom.* (Postpartum woman 4)

However, for some women, the room was not just the bedroom, but anywhere inside the home but they were not supposed to go outside of. In addition to the natural wind outside, they also had to avoid wind inside the home from electric fans and air-conditioning. However, a few accepted air-conditioning but avoided the direct wind from this.

Hygiene practices to avoid xie (cold)

Traditional hygienic practices were believed to help avoid *cold*, particularly cold water, which mainly included washing hair, taking a bath, brushing teeth, or washing any other parts of the body for a month. Washing hair and taking a bath was believed to make the postpartum women expose to *cold* that might cause a cold and headache, while brushing teeth might cause the women to have loose teeth or lose teeth in an early age.

> *I did not wash my hair for a month. I worried I would get cold and headache.* (Postpartum woman 4)

However, most thought it was difficult to follow the traditional hygiene practices strictly for a month. Most washed hair one to two times during *zuo fang* by using warm water and drying hair with a hair drier. The majority of women wiped their body with a towel and warm water every day. Most of them also brushed their teeth with warm water every day but brushed gently and quickly using a unique teeth brush, such as the disposable toothbrush designed particularly for postpartum women. Only one woman kept hygiene as usual washing hair and taking a bath often. Several explanations of not following the traditions strictly were presented by the informants, such as they could not endure such discomfort for a long time, learnings from the internet and accepting a nurse's suggestion to wash hair and take a bath often.

Wearing more clothes to avoid xie (wind and cold)

To prevent *wind* and *cold* entering the body, the women wore more clothes than usual both in cold and hot seasons when they stayed inside the house.

> *In such hot days, I have to wear long sleeve clothes, pants, socks, and even cotton-padded shoes.* (Postpartum woman 15)

Activity caution to avoid xie (diseases)

During the postpartum period, any part of women's body is believed weak and vulnerable to different kinds of diseases, and needs to be protected by not using it much. Thus, they could not watch TV or read a smartphone to protect eyes from becoming tired immediately or getting eye pain, early eyesight decrease or tearing eyes in the future. However, all the women watched TV or read smartphones to a different degree, as these activities were already the habits of their daily life.

> *I felt tired eyes when I read WeChat* (a widely used communication application in China) *for only 5 minutes...... I read several times a day, 6 to 10 times on average. I just cannot stop myself from reading it.* (Postpartum woman 13)

Also, they could not sit, stand, or squat much, or hold heavy things to prevent different kinds of diseases like the chronic pain of waist, knee, and feet, as well as uterine prolapse in the future.

Dietary prohibition to avoid xie (diseases)

Postpartum women could not eat *cold* food such as fruit to avoid delay in lochia discharge, teeth pain or a discomforted stomach. Hard and sour food also needed to be avoided. However, *cold* food was defined differently by the women. For instance, some considered all fruit to be cold, while others believed only fruit like watermelon as being *cold* food. All vegetables were not viewed as *cold* food.

> *I cannot eat cold food or drink cold water. Cold food might cause gong han* (cold uterus), *which would slow down the lochia discharge.* (Postpartum woman 14).

Avoiding sex to avoid xie (diseases)

Sexual activity was supposed to be avoided from the time without lochia discharge to several months after childbirth, believed to prevent infectious diseases, infertility, or being pregnant during postpartum period. Some of them just did not want it because of being tired.

> *I do not know the duration, at least when I have no lochia discharge. Otherwise, it might cause infectious diseases. If you get disease during the postpartum period, you will be challenging to be pregnant again.* (Postpartum woman 10)

Enhancing breastmilk production

To increase breastmilk production, some foods were encouraged to be eaten and in contrast to prevent breastmilk decrease, some foods was prohibited. Also some visitors were restricted during the postpartum period.

Dietary practices prescribed to improve breastmilk production

Some food like crucian soup, *huang hua* (yellow flower), pork trotter soup and so forth were believed to increase the breastmilk production. Thus, postpartum women ate such food intentionally to assure enough breastmilk for the baby.

> *I ate lots of huang hua to increase milk production...... You can put huang hua in any soup you cook, like hen soup, or pork trotter.* (Postpartum woman 9)

Dietary prohibition to avoid decreased breastmilk production

Some foods were believed to decrease breastmilk production such as gastrodiaelata (a traditional Chinese medicine that can be cooked with food), pork liver soup, cock, and cuttlefish. Some shared their experiences and beliefs such as:

> *Two days ago, I ate a bowl of pork liver soup, now I do not have breastmilk. It decreased obviously.* (Postpartum woman 13)

Restricting visitors to avoid decreased breastmilk production

To avoid decreasing breastmilk, those women who were pregnant or menstruating, or breastfeeding a baby were typically restricted from visiting postpartum women.

> *People in this village believed that the pregnant women should not visit postpartum women. My neighbor was pregnant. She said she would be embarrassed if I did not have milk after she visited me.* (Postpartum woman 17)

Discussion

The findings show that the Chinese women living in the rural area of Jiangxi adhered to traditional postpartum beliefs and practices aimed at restoring and maintaining their health and protecting themselves and babies from diseases. The findings are consistent with findings in other regions of China.[4,19,31,32] Other Asian countries, such as Thailand,[5] Myanmar,[9,10] Malaysia,[11] and Vietnam,[6] had similar reports of traditional postpartum practices. Significant similarities and differences of traditional postpartum beliefs and practices have been found in other regions of China.[4,19,31,32] Furthermore, the traditional postpartum beliefs and practices varied among women living in the same sociocultural context of the rural area of Hukou Jiujiang Jiangxi, China. Therefore, it is particularly important to look at the traditional postpartum beliefs and practices as a whole. Two questions arise: Why did all women in this study followed many traditional postpartum practices of *zuo fang* in the vast, changing China rural society? and Why did most of them adapt some practices in their settings?

Based on the findings of this study, the traditional postpartum practices as a cultural ritual with a long history are embedded in women's mind and passed down women from generation to generation. Several reasons were identified to explain why postpartum women chose to follow the traditional such practices though they had a choice. The research supports the view that the postpartum period is vital for women to recover physically, psychologically, mentally, and transition to motherhood smoothly. Consistent with previous studies[38,39] through a woman's contribution of a new life to the family, the traditional postpartum practices serve as a reward for her and an opportunity to establish and improve her social position and rights in her husband's family.[40]

Moreover, Raven et al. (2007) reported that the older generation with health problems who related to performing traditional postpartum practices gave their advice to the next generation so that they could try to avoid similar health problems.[19] Confirmation of this belief was supported in this study. Besides, postpartum women are supposed to obey their parents and parents-in-law because of the unique social value of filial piety in China society.[3] Thus, to be filial and avoiding direct conflict with the older generation, postpartum women are more likely to follow what their mother or mother-in-law tells them to do. More importantly, they also provide family support for women to observe traditional postpartum practices. Studies reflect this practice among different groups of Chinese women.[2,29] In this study, almost all postpartum women lived with their mother or mother-in-law, who provided them family support to a considerable extent.

Last but not the least, as reported by Liu et al. (2006), the lack of postpartum nursing care including education from professionals, might also provide a continuance of women performing traditional postpartum practices.[15] In this study, the women had limited postpartum education during their hospital stay for childbirth, and home visits by nursing or medical staff were absent during the postpartum period.

Even though the women chose to follow the traditional postpartum practices, they did adapt and modify many of these. This study supports the view that the improved living conditions such as warm water supply inside homes, heating equipment in the bathroom, hair drier and so on made the modifications possible and convenient. Similar findings were reported in Hong Kong and Taiwan.[3,4]

Both Chin et al. (2010) in Malaysia and Holroyd et al. (2011) in Hong Kong claimed that the development of western medicine influenced women's beliefs about traditional postpartum practice.[3,26] Questioning of such practices was confirmed in this study, for example, many women accepted nurses' suggestions to adapt their traditional practices, such as the hygiene measures. Naser et al. (2012) reported that in modern society of Singapore, readily available modern technology, such as the internet and online chat forums, gave people access information about global postpartum practices and care, which helped women modify their traditional practice or abandon it as they wished.[8] The women in this study echoed this as a smartphone to different degrees.

Moreover, though postpartum women tended to obey the older generation, they also became more independent. In this study, informants were concerned about their physical comfort and feelings when they chose to adapt and modify some of the traditional postpartum practices, for example, washing hair and brushing teeth. The findings of this group are consistent with the results among Hong Kong postpartum women, who were more independent and self-centered, and made decisions by themselves instead of following the older people, which finally affected what and how they undertook practices during the period of *zuo-yue-zi*.[3]

Also, in this study, the postpartum women were given more freedom by the older generation to make decision of what to do and how to do regarding the traditional practices. As the older generation is becoming less strict about observing the tradition. Thus, postpartum women inherit the traditional postpartum beliefs and practices, while, they also adapt the tradition into the modern sociocultural context.

Conflicts between traditional beliefs and practices and modern postpartum nursing care during postpartum period still exist. The postpartum women feel ambivalent about what practices selected to follow, the traditional or the modern postpartum practices.[41]

Limitations

Only the postpartum women who were ethnic Han in the rural area of Jiujiang, Jiangxi were recruited. However, China has other 55 ethnic groups, from which the traditional postpartum beliefs and practices might be quite varied in the same context. Also, the inclusion criteria did not limit the parity. When women gave birth to the second child, some were more careful as they did not follow the tradition well after the first baby and feared problems may arise, while others were not as compliant as with the first pregnancy because of the lack of support from the family who were busy taking care of the first child. So the number of the children might have an influence on the practices that postpartum women performed. Moreover, postpartum women spoke the local language to different degrees. Thus, the ambiguities of language might have made the researcher miss some information about traditional beliefs and practices in their responses.

Conclusions and Implication for Nursing Practice

This study provides a contemporary picture of traditional postpartum beliefs and practices in the natural settings in an area of China, which define the activities in each aspect of the daily life for women during postpartum period is to assure the health and life of both postpartum women and the babies. It also provides insight into the strength of the health beliefs of the Chinese women about practices during the postpartum period and health later in life.

This study provides insights in the sociocultural context of Jiangxi that has never before obtained and of particular interest that in the 21st century postpartum practices are as they have been for centuries since the Song dynasty. Furthermore, the knowledge of traditional beliefs and practices should be included in the education of midwives and nurses to cultivate their cultural awareness further to provide culturally sensitive postpartum care. Comparative studies are recommended with women who follow the traditional practices and those who do not for the impact of each on the physiological and psychological health of the women, impact on family relations, affect of social support and other factors that affect women in the transition of new roles with a new baby.

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References

1. Rice PL. Nyo dua hli – 30 days confinement: traditions and changed childbearing beliefs and practices among Hmong women in Australia. Midwifery. 2000; 16: 22-34.
2. Liamputtong P, Yinmyam S, Parisunyakul S, Baosoung C, Sansiriphum N. Traditional beliefs about pregnancy and child birth among women from Chiang Mai, Northern Thailand. Midwifery. 2005; 21: 139-153.
3. Holroyd E, Lopez V, Chan S. W-C. Negotiating "Doing the month": An ethnographic study examining the postnatal practices of two generations of Chinese women. Nurs Health Sci. 2011; 13: 47-52.
4. Yeh YC, John W. St, Venturato L. Doing the month in a Taiwanese postpartum nursing center: An ethnographic study. Nurs Health Sci. 2014; 16: 343-351.
5. Liamputtong P. Yu Duan practices as embodying tradition, modernity and social change in Chiang Mai, northern Thailand. Women Health. 2004; 40(1): 79-99.
6. Lundberg PC, Thu NTT. Vietnamese women's cultural beliefs and practices related to the postpartum period. Midwifery. 2011; 27: 731-736.
7. Rice PL, Manderson L. Introduction. In Rice PL, Manderson L. (Eds.), Maternity and Reproductive Health in Asian Societies. New York: Routledge; 2013. pp. 1-18.
8. Naser E, Mackey S, Arthur D, Klainin-Yobas P, Chen H, Creed D. An exploratory study of traditional birthing practices of Chinese, Malay and Indian women in Singapore. Midwifery. 2012; 28: e865-e871.
9. Sein KK. Beliefs and practices surrounding postpartum period among Myanmar women. Midwifery. 2013; 29: 1257-1263.
10. Nadia DS, May MT, Ei EK, May S. Delivery and postpartum practices among new mothers in Laputta, Myanmar: intersecting traditional and modern practices and beliefs. Cult Health Sex. 2016; 1-13.
11. Shariffah Suraya SJ. Beliefs and practises surrounding postpartum period among Malay women. Proc Social Sci Res. 2014; 49-417.
12. Sharma S, Teijlingen E, Hundley V, Angell C, Simkhada P. Dirty and 40 days in the wilderness: Eliciting childbirth and postnatal cultural practices and beliefs in Nepal. BMC Pregnancy Childbirth. 2016; 16:147.
13. Liu YQ, Petrini M, Maloni J. "Doing the month": Postpartum practices in Chinese women. Nurs Health Sci. 2015; 17: 5-14.
14. Heh SS, Coombes L, Bartlett H. The association between depressive symptoms and social support in Taiwanese women during the month. Int J Nurs Stud. 2014; 41: 573-579.
15. Liu N, Mao L, Sun X, Liu L, Chen B, Ding Q. Postpartum practices of puerperal women and their influencing factors in three regions of Hubei, China. BMC Public Health. 2006; 6(274): 1-7.

16. Liu N, Mao L, Sun X, Liu L, Yao P, Chen B. The effect of health and nutrition education intervention on women's postpartum beliefs and practices: a randomized controlled trial. BMC Public Health. 2009; 9(45): 1-9.
17. Callister LC, Eads MN, Yeung Diehl JP. Perceptions of giving birth and adherence to cultural practices in Chinese women. Am J Matern Child Nurs. 2011; 36: 387–394.
18. Mao LM, Ma LP, Liu N, Chen BH, Lu QG, Ying CJ, Sun XF. Self-reported health problems related to traditional dietary practices in postpartum women from urban, suburban and rural areas of Hubei province, China: the 'zuòyuèzi.' Asia Pac J Clin Nutr. 2016; 25: 158–164.
19. Raven J, Chen Q, Tolhurst R, Garner P. Traditional beliefs and practices in the postpartum period in Fujian Province, China: a qualitative study. BMC Pregnancy Childbirth. 2007; 7(8): 1-11.
20. Dennis CL, Fung K, Grigoriadis S, Robinson GE, Romans S, Ross L. Traditional postpartum practices and rituals: a qualitative systematic review. Women Health. 2007; 3(4): 487–502.
21. Posmontier B, Horowitz JA. Postpartum practices and depression prevalences: technocentric and ethnokinship cultural perspectives. J Transcult Nurs. 2004; 15(1): 34-43.
22. Withers M, Kharazmi N, Lim E. Traditional beliefs and practices in pregnancy, childbirth and postpartum: A review of the evidence from Asian countries. Midwifery. 2018; 56: 158–170.
23. Cheung NF. Chinese zuoyuezi (sitting in for the first month of the postnatal period) in Scotland. Midwifery. 1997; 13: 55-65.
24. Shanti S, Nicholls R, Ritchie J, Razee H, Shafiee S. Eating soup with nails of pig: thematic synthesis of the qualitative literature on cultural practices and beliefs influencing perinatal nutrition in low and middle-income countries. BMC Pregnancy Childbirth. 2016; 16:192.
25. Sun DZ, Li SD, Liu Y, Zhang Y, Mei R, Yang M. Differences in the origin of philosophy between Chinese medicine and western medicine: Exploration of the holistic advantages of Chinese Medicine. Chin J Integr Trad and West Med. 2013; 19(9): 706-711.
26. Chin Y, Jaganathan M, Hasmiza A,Wu M. Zuo yuezi practice among Malaysian Chinese women: tradition vs modernity. Traditional Birth. 2010; 18(3): 170-175.
27. Yeh YC, John W. St, Venturato L. Inside a postpartum nursing center: tradition and change. Asian Nurs Res. 2016; 10: 94-99.
28. Chien LY, Tai CJ, Ko YL, Huang CH, Sheu SJ. Adherence to ''doing-the-month'' practices is associated with fewer physical and depressive symptoms among postpartum women in Taiwan. Res Nurs Health. 2006; 29: 374–383.
29. Cheng CY, Pickler R. Effects of stress and social support on postpartum health of Chinese mothers in the United States. Res Nurs Health. 2009; 32: 582–591.
30. You H, Chen J, Bogg L, Wu Y, Duan S, Ye C, . . . Dong H. Study on the factors associated with postpartum visit in rural China. PLoS ONE. 2013; 8(2): e55955.
31. Holroyd E, Katie F, Chun L, Ha S. "Doing the month": An exploration of postpartum practice in Chinese women. Health Care Women Int. 1997. 18: 301-313.
32. Strand M, Perry J, Guo J, Zhao J, Janes C. Doing the month: rickets and postpartum convalescence in rural China. Midwifery. 2009; 25: 588 –596.
33. Fetterman DM. Ethnography: step-by-step. (3rd Ed.). SAGE: Los Angeles; 2010.
34. Holloway I, Galvin K. Qualitative Research in Nursing and Healthcare (4th ed.) UK: Wiley-Blackwell; 2017.
35. Whitehead TL. Basic classical ethnographic reaearch methods. CEHC. 2005; 1-29.
36. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psycho. 2006; 3(2): 77-101.
37. Guba E, Lincoln Y. Competing paradigms in qualitative research. In Denzin N, Lincoln Y. Handbook of qualitative research. CA: Sage: Thousand Oaks; 1994. pp. 105-117.
38. Cheung N. The cultural and social meanings of childbearing for Chinese and Scottish women in Scotland. Midwifery. 2002; 18: 279-295.
39. Elter PT, Kennedy HP, Chesla CA. Spiritual healing practices among rural postpartum Thai women. J Transcult Nurs. 2016; 3(27): 249–255.
40. Huang YC, Mathers NA. comparative study of traditional postpartum practices and rituals in the UK and Taiwan. Divers Equal Health and Care. 2010; 7: 239–47.
41. Ngai FW, Chan S, Holroyd E. Chinese primiparous women's experiences of early motherhood: factors affecting maternal role competence. J Clin Nurs. 2011; 20: 1481–1489.

การวิจัยเชิงชาติพันธุ์วรรณนาความเชื่อและการปฏิบัติตัวหลังคลอดแบบดั้งเดิมของสตรีจีน

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บทคัดย่อ: ในหลายสังคมของเอเชีย การปฏิบัติตัวหลังคลอดแบบดั้งเดิมถูกเชื่อว่ามีความสำคัญต่อสุขภาพของสตรีและทารก ความหมายทางสังคมและวัฒนธรรมที่ฝังลึกมีความเกี่ยวพันกับการปฏิบัติที่เกี่ยวข้องกับด้านพฤติกรรม การทำกิจกรรม อาหาร สุขอนามัย และการดูแลทารก ซึ่งมีความหลากหลายตามภูมิภาค จากการศึกษาที่ผ่านมาแสดงให้เห็นถึงการแปลความหมายที่หลากหลายของความเชื่อและการปฏิบัติตัวหลังคลอดแบบดั้งเดิมของชุมชนท้องถิ่นต่างๆ โดยในพื้นที่ชนบทของจิ่วเจียง เจียงซี ประเทศจีน นั้น ความเชื่อและการปฏิบัติตัวหลังคลอดแบบดั้งเดิมจากทัศนะของสตรีหลังคลอดยังไม่มีหลักฐานเชิงวิชาการที่ชัดเจน บทความนี้เป็นส่วนหนึ่งของการวิจัยเชิงชาติพันธุ์วรรณาที่มีวัตถุประสงค์ เพื่ออธิบายความเชื่อและการปฏิบัติตัวหลังคลอดแบบดั้งเดิมของสตรีในบริบทสังคมวัฒนธรรมของพื้นที่ชนบทของจิ่วเจียง เจียงซี ประเทศจีน โดยทำการศึกษาในหมู่บ้านของเขตการปกครองท้องถิ่นของเมอิง และจางชิง ในเมืองจิ่วเจียง มณฑลเจียงซี ประเทศจีน เก็บรวบรวมข้อมูลตั้งแต่เดือนมกราคม 2560 ถึงเดือนกรกฎาคม 2560 โดยใช้วิธีการสังเกตแบบมีส่วนร่วมในบริบทของพื้นที่ชนบท และการสัมภาษณ์เชิงลึกในสตรีหลังคลอดซึ่งเป็นผู้ให้ข้อมูลหลักจำนวน 18 คน วิเคราะห์ข้อมูลโดยใช้หลักการวิเคราะห์ข้อมูลเชิงคุณภาพ 6 ขั้นตอน ผลการศึกษาพบ สามแก่นสาระที่เกิดขึ้นจากการปฏิบัติตัวหลังคลอดแบบดั้งเดิม ได้แก่ การเพิ่มความสมดุลย์ของหยิน-หยาง การป้องกันปัจจัยที่ทำให้เกิดโรคเข้าสู่ร่างกาย และการเพิ่มการผลิตน้ำนม ซึ่งความหลากหลายของความเชื่อและการปฏิบัติตัวหลังคลอดแบบดั้งเดิมได้รับอิทธิพลมาจากบริบทสังคมวัฒนธรรมของท้องถิ่น องค์ความรู้ถึงความสำคัญทางวัฒนธรรมของความเชื่อและการปฏิบัติตัวหลังคลอดแบบดั้งเดิมของสตรีในชนบทจึงเป็นสิ่งที่จำเป็นสำหรับพยาบาลในการปฏิบัติการพยาบาลที่มีความไวทางวัฒนธรรม

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คำสำคัญ: สตรีชาวจีน การวิจัยเชิงชาติพันธุ์วรรณนา การปฏิบัติตัวหลังคลอด ความเชื่อ วัฒนธรรม

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Factors Predicting Functional Ability among Older Adults undergoing Hip and Knee Arthroplasty

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Abstract: Total joint arthroplasty is a standard surgical procedure for reducing chronic joint pain and improving functions and quality of life among older adults with osteoarthritis. Preoperative patient expectations of surgical treatment and care transitions are vital concerns involving postoperative recovery. This prospective cohort study examined factors predicting functional ability at two-week post operation in older adults undergoing hip and knee arthroplasty. Ninety-five participants scheduled for total joint arthroplasty should be: hip and knee completed questionnaires, which included the Demographic and Health Information Questions, Functional Ability Improvement Expectation Questionnaire, Care Transition Measure-15, and Modified Barthel Activities of Daily Index. The data were analyzed by using descriptive statistics, Pearson's coefficient correlation, and hierarchy regression analysis.

Results showed that the participants had a high level of functional ability. Functional ability improvement expectation and quality of care transition were positively related to functional ability, whilst patients' characteristics were not significantly correlated to functional ability. The main subscales of functional ability improvement expectation: walking ability, social participation, and quality of care transition: management preparation, were the predictors, which jointly explained 36.9% of variance in functional ability. These findings may help nurses to develop interventions focusing on helping patients to develop realistic expectations about functional ability after total joint arthroplasty. This involves particularly walking ability and social participation, and coordinating patient care among patients and their families along with health care team in order to set appropriate management preparation for older adults undergoing total joint arthroplasty, and ultimately to improve quality of nursing care and enhanced clinical outcomes.

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Keywords: Functional ability, Functional ability improvement expectation, Hip arthroplasty, Knee arthroplasty, Quality of care transition, Total joint arthroplasty.

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Introduction

Severe osteoarthritis is a common problem in older adults and is a major cause of disability due to pain and mobility limitation.[1,2] Total joint arthroplasty

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(TJA) involving both hip and knee is known as a successful and cost-effective surgical procedure used in gold standard treatment of severe osteoarthritis and other hip conditions, such as hip fracture or avascular necrosis of the hip.[3,4] Even after complete TJA, some patients may have unsatisfactory outcomes,[5] but there is often improvement of functional ability and physical performance (stiffness and range of motion) as well as pain relief. Several factors namely personal characteristics (i.e. age, comorbidities, and obesity) and preoperative function, which influences functional ability or clinical outcomes postoperatively, have been documented.[6-9] Among these, patients' expectation in regaining normal functional ability after surgery is one of many reasons for patients to seek TJA treatment. This expectation is currently known to be associated with better outcomes and acts as an independent predictor of improved physical function and pain reduction in persons with total joint arthroplasty (PWTJA).[5,10]

Evaluating quality of care transition across care settings has been applied to assure effective care, and quality care outcomes were reported as well.[11] A proactive discharge plan for better transition care requires the coordination and continuity of care as well as support including in-home follow-up which is essential to improve quality of clinical outcomes.[11,12] Focusing on quality of care transition is imperative for patient's clinical outcomes, interdisciplinary treatment goals, and health policy enchantment. Admittedly, monitoring a trajectory of patient recovery from surgery is not only crucial as it would give information to patients when they can expect to return to normal activity of daily life, but is also essential to orthopedists and policymakers to plan treatment and care for these patients properly. Yet, how to evaluate and what is the practical timeline to justify quality of surgical care is even more challenging. Previous studies reveal that the functional improvement from TJA was seen within the first three months and continued up to 12 months postoperatively.[13-15] These results may reflect an appropriate time period to measure clinical outcomes, although a gap exists in which some immediate complications may not be definitely identified. The timely basis to measure outcomes after hip and knee arthroplasty were based on particular clinical consensus (i.e. clinical failure or radiographic), which might less focus on the normal postoperative recovery pattern[10,14] starting immediately after surgery. The World Health Organization (WHO) emphasizes a priority goal of 2025 that early detection is significant to enhance quality of care.[16] Thus, detecting deviant functional performance on a timely recovery pattern is practicable and critical to improving continuing care. This study attempted to verify the immediate assessment of two-week follow-up after TJA. An immediate outcome would be valuable information for bridging the gap of care and develop holistic care plans and treatment for improvement of functional ability in this population. Therefore, the study aimed to examine factors predicting functional ability in PWTJA at the 2-week postoperative follow-up.

Conceptual Framework and Review of Literature

Regaining postoperative functional ability has been considered as an outcome indicator to justify care quality in PWTJA both hip and knee arthroplasty. To assess quality of surgical care, the renowned framework known as the Donabedian model[17], was used to evaluate the quality of continuing care. Basically, the model describes the association among three constructs: structures of care (i.e. characteristics of setting, workforce characteristics), process of care (i.e. nursing intervention for patient education, and coordination of care including discharge planning), and health outcomes (quality of life, and patient ability to function in daily activity). According to the model, good structure of care should lead to the likelihood of good process of care, which should in turn increase likelihood of good health outcomes.[18]

Evidence has been documented that the model was a valuable framework in assessing care quality, such as surgical and trauma care quality.[19,20] For structure of care, it was the attributes of settings—material, human, and organization—where the care occurred.[17] Thus, human attributes such as the characteristics of patients was included in the structure of care, which was separated from other structures of care to possibly increase the linkage of structure-process-outcome[21] as a previous study underlined that patient needs and values are recognized as a dimension of care quality.[22] For other attributes of structure of care (material and organization), the clinical care pathway may play an important role in controlling hospital facilities, multidisciplinary roles, and surgical treatments, which influence patient expectations, process of care, and postoperative health outcomes. As care for TJA is provided (hip arthroplasty: THA and knee arthroplasty: TKA), the patient moves along the continuing care delivery. In the selected clinical setting of this study, those who underwent TJA were planned to discharge home based on the clinical pathway. Briefly, the clinical pathway designed for TKA included the role of nurses and orthopedists taking care of patients during hospital admission on the preoperative day to 4 days postoperatively. For the THA, the clinical pathway included 7 days of hospital stay from preoperative to discharge, with 5 days postoperative. For example, nurses are responsible for preparing patient readiness and safety for operation and enhancing patient post-operative recovery (i.e. complete nursing assessment, preoperative teaching, pain management, and discharge planning including home and environment safety), whilst orthopaedists play an important role such as ordering preoperative laboratory tests, review care plans with patients, families, and nurses, and prescribe antibiotics used during operation. These activities were given to patients on the preoperative day. Besides the implementation of clinical pathways, the discharge process was planned by the multidisciplinary team including a primary care nurse, who was responsible for taking care of the patient during admission, clinical pharmacists, home health care nurses, and orthopedists. Since most PWTJA are older adults, functional decline during hospitalization together with comorbidities may result in vulnerability to unsatisfactory transition and poor clinical outcomes. Additionally, as clinical pathways were specifically designed for a single disease or condition, it may worsen or deteriorate health outcomes in older adults with coexisting conditions.[23] This was consistent with previous studies which revealed that age, comorbidity , and being overweight or obese were the predictive factors of functional ability in PWTJA.[8,24, 25] Moreover, the pre-operative functional status was one of the significant predictors in predicting excellent outcome in patients with hip arthroplasty.[9]

However, patient expectation was found to be a vital factor related to functional outcome among PWTJA. Generally, patient expectations were defined as desires, needs, and requests resulting from medical care.[26] As the patient expectation was one of patient's psychological factors contributing to the success of post-operative functional recovery and rehabilitation, several studies revealed the association between patient expectations and health outcomes including functional ability postoperatively. For example, the patients who had high pre-operative expectations of postoperative outcomes revealed an association with the postoperative improvement of patient-reported outcome measures compared to those who had lower expectations.[10] Additionally, a higher rating of expectations showed a correlation with a lesser improvement in pain from preoperative to three-month postoperative assessment in PWTJA. Also, a higher rating of expectations had an association with a greater improvement in functions at six-month postoperatively of TKA.[27] However, inconsistent findings were found as there was not a significant correlation between the level of preoperative expectations and clinical outcomes at less than 6 weeks to 12 months postoperatively.[28, 29] Preoperative expectations may result in different postoperative outcomes at different time intervals after TJA. As mentioned above, patient expectations were focused on functional ability improvement expectation after TJA in this study. Therefore, patients' characteristics including age, comorbidity, body mass index, pre-operative physical function, and functional ability improvement expectation were selected under the structure of care to determine the directional association with the process of care and health outcome - functional ability in this study.

In process of care, to provide perioperative care; quality of care transition as care delivery during admission to discharge home and care coordination, which includes multidisciplinary care team, are important to modify and potentially mitigate the characteristics of patients who are at risk for surgery through standardization of care. Previous studies indicated that improving coordination of discharge process through education for patients/caregiver and post discharge follow-up resulted in decreasing adverse health outcomes such as readmissions after TJA.[30,31] Notably, incorporating characteristics of patients and quality of care transition into the Donabedian model leads to better understanding and improvement in functional ability among patients with TJA, which is one of clinical outcomes that have been focused over recent years.[32] Evidence from previous studies reveals a robust positive association among structure of care, process of care, and health outcomes in hospitalized patients and traumatic patients[20,33], although there are limited studies conducted in Thai TJA. Development of any practical interventions for promoting postoperative health outcomes should be designed to align patient expectations on clinical outcomes that are supported by evidence. This will lead to appropriate management of healthcare providers and decision making of surgery in patients who primarily would not have undergone TJA. Importantly, applying specific quality of care framework is also necessary for better understanding and exploring the continuing care gap in this population.

Methods

Research Design: A prospective cohort study.

Sample and Setting: Ninety-eight consecutive older adults scheduled for hip and knee arthroplasty were enrolled at a university hospital in Bangkok, Thailand. Older adults were recruited in this study if they were: aged 60 years and over; scheduled for hip and knee arthroplasty for the first time; and able to communicate in Thai. The exclusion criteria comprised older adults who had a history of cognitive impairment or psychiatric disorders, admitted to intensive care unit postoperatively due to uncontrolled health problems, developed any postoperative complications (i.e. cognitive alteration, re-operation), and were not able to be discharged to home as the clinical pathway. The sample size was calculated by using G*Power program. To determine a suitable sample size for multiple regression analysis, a small effect size of .20, a power of .80, an alpha of .05, and 11 predictors were used for sample size calculation. The sample sizes needed were 95 individuals. Since this study was a prospective correlational study, a dropout rate of 10% was added, so the required samples were 105 individuals.

Ethical Consideration: After approval was obtained from the Ethical Committee, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand, (ID 05-57-04), the older adults who met the inclusion criteria were approached by well-trained orthopedic nurses (RNs). Participants were informed of the study objective and procedures and their right to refuse to participate or withdraw at any time without detriment to their care and treatment. There were no harmful or life-threatening risks in this study, while the minor risks to participants such as breach of confidentiality, discomfort, and inconvenience of completing questionnaires along with benefits to participants and/or society were informed. All their identities were assured to be kept confidential. An informed consent form was distributed to each participant; and written agreement was obtained before the questionnaires were administered. In case, the participants had visual impairment, verbal agreement to participate in the study was legally accepted.

Instruments: Four instruments were used:

Demographic and Health Information Questionnaire. This was designed to gain information related to participants' characteristics (age, educational level, healthcare payment) and health information (body mass index, fall history, types of surgery, pre-operative physical functional).

Functional Ability Improvement Expectation Questionnaire. A 15-item questionnaire was used to evaluate patient expectations of functional ability improvement at post-surgery. It was developed by the researchers based on a literature review and patient focused-interviews (10 PWTJA). This questionnaire was designed to gain information regarding patient expectations of post-surgical functional ability improvement after hip or knee arthroplasty. The questionnaire comprises 3 main subscales of function ability representing patient expectations of post-surgical function: 1) walking ability (4 items; i.e. improved ability to take a long distance walk, improved ability to walk without a walking aid), 2) symptom reduction (6 items; i.e. ability to make leg straight, relieve joint pain that interferes with sexual ability), and 3) social participation (5 items; i.e. ability to participate in religious activities, ability to participate in social activities such as elderly club or meeting with friends). The rating score for each item ranges from 0 (no expectation) to 3 (high expectation). Each subscale had unequal items, so the sum scores were divided by the numbers of items to get the total score which ranged from 0-3 on each subscale, and the higher scores indicated higher patient expectations of functional ability improvement after TJA. Content validity was verified by three experts (an orthopaedist, orthopaedic advanced practice nurse, and an experienced instrument developer) and a CVI of .93. For reliability Cronbach's alpha tested with 10 PWTJA in a pilot study was .76 and in the main study of 95 participants, the Cronbach's alphas for overall scale, walking ability subscale, symptom reduction subscale, and social participation subscale were .71, .65, .73, and .75, respectively.

Care Transition Measure -15 (CTM-15). The CTM-15 was developed by Coleman[34] to assess quality of care transition from hospital to home perceived by the study participants. It comprises 15 items (for example, 'the hospital staff took my preferences and those of my family or caregiver into account in deciding what my health care needs would be when I left the hospital') with four subscales, critical understanding, important preferences, management preparation, and care plan.[35] Each item uses a 5-point Likert scale of strongly disagree, disagree, agree, strongly agree, and don't know/don't remember/not applicable. The respondent scores range from 1 (strongly disagree) to 4 (strongly agree). Regarding the last scale (don't know/don't remember/not applicable), this is not counted as an answered question and not calculated for contributing to the CTM score. A linear transformation of mean scores was performed to obtain a 0-100 score. Higher scores reflect a higher quality of care transition. The CTM-15 has demonstrated good reliability in various populations with Cronbach's alpha reliability ranging from .93 to .95.[31] After receiving permission by the owner, the original version was translated into Thai by the standard translation method[36], the content validity was assessed by two experts (CVI = .91), and a pilot testing was conducted before administrating in this study. Cronbach's alpha reliability in this study was .74.

Modified Barthel Activities of Daily Index (MBAI). The MBAI-Thai version of Jitapunkul et al.[37] was employed to measure functional ability of the study participants. The MBAI-Thai version is a 10-item questionnaire asking about activities such as feeding, toilet use, transferring, and going up and down stairs (for example, transferring: ability to transfer from bed to chair or wheelchair). Each item contains different scores according to its difficulties. Total score ranges from 0 to 20. Because data was collected at a 2-week follow-up in this study, when participants were not allowed to go up and down stairs, so the items involving these activities were not assessed. Therefore, the total score ranged from 0 to 18. The Cronbach's alpha reliability of the MBAI-Thai version tested in 703 older adults was .67, and its inter-rater reliability was .79.[37] The Cronbach's alpha reliability in this study participants was .80

Data Collection: To avoid invalid information due to writing and vision problems, an interview method and extraction from medical record were employed for data collection, which was given on the first day preoperatively (Demographic and Health Information Questions and Functional Ability Improvement Expectation Questionnaire), and at two-week postoperative follow-up (CTM-15 and MBAI) by well-trained orthopedic nurses (RNs).

Data Analysis: All data analyses were performed using SPSS for Windows version 18 (Software License Download @ Mahidol). Descriptive analysis was performed for all study variables. Assumptions of linearity and normality were checked before using Pearson's correlation and predictive analysis. Additionally, autocorrelation and multicollinearity were also verified for regression analysis assumptions, and Pearson's correlation was employed to examine the strength and associated direction between the study variables. Based on a theoretical framework, the hierarchy regression analysis was used to examine predictive capability of the set of variables in predicting the likelihood of functional ability at a 2-week follow-up.

Results

Participants' Characteristics

The total of initial participants was 98. Among these, three participants dropped out (one participant could not be discharged to home as per the clinical pathway, and two others were lost to follow-up and could not contact due to changes in address). The remaining participants (n=95) had a mean age of 67.2, and 93.7% were female. More than half (54.7%) had ≥2 comorbidities. Most participants lived with and got support from their children. The average time of illness since diagnosis of osteoarthritis was 15.25 years. Pain intensity mean score from medical records at admission was 3.10 from 10 numeric rating score. Most participants (67.4%) were independent pre-operative physical function. Overall average LOS was 4.2 days (See Table 1)

Functional Ability Improvement Expectation, Quality of Care Transition, and Functional Ability

As shown in Table 2, the participants had moderate functional ability improvement expectation and quality of care transition when the mean score was compared with the mid possible score of the measures. The Social Participation subscale was the highest expectation of improvement, while the lowest expectation of improvement was symptom reduction. Regarding quality of care transition, the critical understanding dimension showed the highest score, followed by care plan. For functional ability, participants reported high ability to perform activities of daily living (ADLs) when the mean score was compared with the mid possible score.

Predictors of Functional Ability

As shown in Table 3, patients' characteristics including age, body mass index (BMI), comorbidity, and pre-operative physical function did not show a statistical correlation to functional ability. Overall functional ability improvement expectation and quality of care transition showed a positive correlation to functional ability.

In the regression model, the structure of care variable, patients' characteristics (age, BMI, comorbidity, and pre-operative physical function), were entered into the model first, followed by functional ability improvement expectation. Then, the care process variable, quality of care transition was entered into the predictive model. To assess more specific benefits of functional ability improvement expectation and quality of care transition on improvement of care, only subscales of those two variables were investigated for their predictive powers. In the first model, although the model was insignificant, pre-operative physical function was a significant predictor of functional

Table 1. Percentage, mean, and standard deviation of participants' characteristics (N = 95)

Variable	N (%)	Variable	N (%)
Gender		**Site of surgery**	
male	6 (6.3)	hip	14 (14.7)
female	89 (93.7)	knee	81 (85.3)
Age		**Duration of disease**	
(M ± SD = 67.2 ± 9.0)		(M ± SD = 15.25 ± .75 years)	
60-74 years	76 (80)	no	17 (17.9)
75- 84 years	16 (16.8)	1-2	26 (27.4)
85 +	3 (3.2)	≥ 2	52 (54.7)
Education		**Pain** (M ± SD = 3.10 ± .24)	
informal education	3 (3.2)	mild	70 (73.6)
primary school	55 (57.9)	moderate	25 (26.4)
secondary school	22 (23.1)	**Fall history**	
graduate +	15 (15.8)	no	54 (56.8)
Marital status		yes	41 (43.2)
single	7 (7.4)	**Visual problem**	
married	77 (81.1)	no	45 (47.4)
widowed/divorced	11 (11.5)	yes	50 (52.6)
Living		**LOS** (M ± SD = 4.2 ± 2.3)	
alone	2 (2.1)	3-5 days	83 (87.4)
with spouse	21 (22.1)	6-7 days	12 (12.6)
with children	52 (54.7)	**Body mass index** (kg/m^2) *	
with relatives	20 (21.1)	underweight (<18.5)	2 (2.1)
Social support		normal (18.5 – 22.9)	12 (12.6)
spouse	18 (18.9)	obese level I (23 - 24.9)	20 (21.1)
children	69 (62.2)	obese level II (25 – 29.9)	42 (44.2)
other (i.e relatives)	18 (18.9	obese level III (^{3} 30)	19 (20.0)
Pre-operative physical function		**Comorbidity**	
independent	64 (67.4)	no	17 (17.9)
mild dependent	25 (26.3)	1-2	26 (27.4)
moderate dependent	6 (6.3)	≥ 2	52 (54.7)

Note: * Based on Asian Index value

Table 2. Mean scores and standard deviation of study variables (N = 95)

Variables	Range		M ± SD
	Possible score	Actual score	
Overall FAI expectation*	0 - 3	1.33 - 2.87	2.12 ± 0.30
walking ability subscale	0 - 3	0.75 - 3.00	2.14 ± 0.51
symptom reduction subscale	0 - 3	1.17 – 2.83	2.04 ± 0.41
social participation subscale	0 - 3	1.33 – 3.00	2.20 ± 0.48
Overall quality of care transition	0 -100	28.89 – 80.00	60.42 ± 12.50
critical understanding subscale	0 -100	27.78 – 88.89	63.21 ± 14.04
important preferences subscale	0 -100	11.11 – 100.00	59.29 ± 21.10
management preparation subscale	0 -100	8.33 – 83.33	57.98 ± 16.70
care plan subscale	0 -100	16.67 -100.00	58.59 ± 19.42
Functional ability (MBAI)**	0 -18	15.00 – 18.00	16.63 ± 0.88

Note: * Functional ability improvement expectation; **Modified Barthel Activities of Daily Index

Table 3. Correlation between independent variables and functional ability (N = 95)

Variable	1	2	3	4	5	5.1	5.2	5.3	6	6.1	6.2	6.3	6.4	7
1. Age	1.00													
2. Body mass index	-.02	1.00												
3. Comorbidity	.16	-.05	1.00											
4. Pre-operative physical function	.08	.10	.30**	1.00										
5. FAI Expectations[a]	.11	.10	-.16	-.14	1.00									
5.1 walking ability	.09	.04	-.12	-.05	.73**	1.00								
5.2 symptom reduction	.14	.17	-.17	.01	.75**	.57**	1.00							
5.3 social participation	-.01	-.02	-.05	-.28**	.56**	.12	-.03	1.00						
6. Quality of care transition	.06	-.03	-.05	.21*	.46**	.38**	.43**	.14	1.00					
6.1 critical understanding	-.14	-.13	-.13	.12	.41**	.29**	.35**	.19	.54**	1.00				
6.2 important preferences	.13	.05	-.02	.18	32**	.24*	.31**	.07	.75**	.52**	1.00			
6.3 management preparation	.11	.02	.03	.07	.34**	.36**	.36**	.12	.71**	.42**	.35**	1.00		
6.4 care plan	.19	.01	.02	.35**	.23*	.21*	.16	.10	.55**	.35**	.32**	.22*	1.00	
7. Functional ability	-.03	-.09	-.10	.17	.24*	.42**	.34**	-.17	.39**	.36**	.16	.39**	.17	1.00

Note: [a]functional ability improvement expectation; * significance at the .05 level; ** significance at the .01 level

ability. In the second model, after controlling patients' characteristics, only pre-operative physical function and walking ability were significant predictors and explained an additional 21.9% of variance in functional ability. For the final model, all predictors explained 36.9% of variance in functional ability, which accounted for an extra 8.0% of the variance in functional ability. However, only walking ability, social participation, and management preparation, were significant predictors of functional ability in the final model (Table 4).

Table 4 Summary of hierarchical regression analysis of factors predicting functional ability (N = 95)

Predictors	b	S.E (b)	Beta	t	p-value
Model 1					
constant	17.373	.923		18.820	.000
age	-.003	.010	-.026	-.249	.804
body mass index	-.027	.022	-.124	-1.206	.231
comorbidity	-.404	.249	-.175	-1.620	.109
pre-operative physical function	.349	.157	.239	2.219	.029
R = .265; R^2 = .070; Adjusted R^2 = .029; SEE = .875; Overall $F_{(4,90)}$ = 1.702, p = .157					
Model 2					
constant	16.594	.963		17.234	.000
age	-.009	.009	-.095	-1.022	.309
body mass index	-.034	.020	-.156	-1.680	.097
comorbidity	-.211	.226	-.092	-.933	.354
pre-operative physical function	.283	.146	.193	1.940	.050
walking ability[a]	.646	.195	.373	3.313	.001

Table 4 Summary of hierarchical regression analysis of factors predicting functional ability (N = 95)(Cont.)

Predictors	b	S.E (b)	Beta	t	p-value
symptom reduction[a]	.266	.223	.138	1.192	.237
social participation[a]	-.299	.174	-.164	-1.721	.089
R = .538; R^2 = .289; Adjusted R^2 = .232; SEE = .778; R^2 change = .219; Overall $F_{(7,87)}$ = 5.054, p = .000					
Model 3					
constant	15.643	1.022		15.309	.000
age	-.004	.010	-.043	-.444	.658
body mass index	-.023	.020	-.103	-1.104	.273
comorbidity	-.214	.222	-.093	-.963	.339
pre-operative physical function	.230	.156	.157	1.471	.145
walking ability[a]	.549	.194	.317	2.838	.006
symptom reduction[a]	.073	.228	.038	.320	.750
social participation[a]	-.377	.177	-.207	-2.128	.036
critical understanding[b]	.014	.008	.228	1.816	.073
important preferences[b]	-.005	.005	-.126	-1.160	.249
management preparation[b]	.011	.006	.211	2.037	.045
care plan[b]	-.001	.005	-.014	-.137	.891
R = .607; R^2 = .369; Adjusted R^2 = .285; SEE = .751; R^2 change = .080; Overall $F_{(11,83)}$ = 4.407, p = .000					

Note: * significance at the .05 level; [a] functional activity improvement expectation subscale, [b] quality of care transition subscale

Discussion

Results from our study address the functional ability of Thai older adults undergoing TJA at the immediate time point, on a 2-week assessment post-discharge, and a predictive power of care structure (patients' characteristics and functional ability improvement expectation) and care process (quality of care transition) on functional ability. Results from our study revealed functional ability assessed by MBAI was high. Previous studies suggest that the significant change of treatment outcomes for TJA was observed at the first three months until six months [27,28,38], while some studies examined outcomes at 12 months postoperatively.[14,29] Unfortunately, our findings could not be compared with those studies since we assessed the outcomes at a different time point together with different outcomes. This high level of functional ability in this study may be because participants received routine preoperative health education at the out-patient department along with screening for operative risks. In the case of patients who had risks for surgery, they were referred to specialists, such as cardiologists or anesthesiologists for evaluation and treatment before getting surgery. Obviously, our results showed high level of performing ADLs, basic physical performance.

In the first model of regression analysis results, only pre-operative physical function showed significant predictability on functional ability 2-week postoperatively, while age, BMI, and comorbidity were not significant predictive powers on functional ability. This result was partly supported by previous studies, which indicated that advancing age, high BMI, and having comorbidities were negative predictors of post-operative functional outcomes; in contrary to pre-operative physical function was a strong predictor of functional outcome.[25, 39] The explanation of these results maybe because most of the participants in this study had predominantly independent physical function preoperatively. Additionally, they received elective surgery, which were given the comprehensive pre-operative assessment, evaluation, and management for preventing post-operative complications. These led the participants to maintain their functional ability postoperatively. However, age, BMI, and comorbidity were not significant predictor of functional ability which was differed from previous studies.[7, 25, 39] The different findings could be explained by the average age and BMI of participants in this present study were lower than those in the previous studies. In addition, the difference in comorbidity and functional outcome measure may affect the results. For example, the comorbidity in this study was investigated by counting the number of comorbidities compared with the Charlson index and the Elixhauser comorbidity measures used in other studies.[39] For post-operative outcomes, functional ability in this study was evaluated by using MBAI, which indicated basic functional ability, while previous studies measured both physical and emotional function representing functional outcomes by using the Western Ontario McMaster Universities Osteoarthritis Index (WOMAC) and Short Form-36 (SF-36).[25,39] Another explanation may be because the participants in this study were a younger age group and half of them had more than two comorbidities (mostly metabolic syndromes), which were common diseases reported in older adults. These led the participants to maintain their pre-operative physical function more than it influenced post-operative functional ability.

After functional ability improvement expectation subscales were added in the second model, only social participation and walking ability subscales were independent predictors of functional ability at a 2 week follow-up. This was in contrast to a previous study that patients' expectations of surgical treatment outcomes, particularly relief of pain, which one of vital symptoms of osteoarthritis, was an independent predictor of physical function in both the WOMAC and SF-36 subscales.[10] This dissimilar finding may be due to the different types of measures used, the timing of assessment, and outcome aspects.[28] In addition, the participants in this study might have some difficulty in walking as well as social participation as their average duration of time since diagnosis was long lasting, whereas pain was reported as low level, and no other symptoms such as stiffness or warmth and swelling were reported. Therefore, these participants may be more concerned about their ability of walking and social participation, which led to a need to fulfill improvement more than symptom reduction of pain, which they perceived less at the timing of assessment. Interestingly, social participation showed a negative association and prediction with functional ability. One possible reason may be the participants only performed basic functional ability at a 2-week follow-up, which it might be some limitations in functional ability impeding the daily rituals at post-surgery. Notably, due to the nature of post-operative TJA, the PWTJA are only able to perform full functional performance at least three months post-operatively, so during the immediate time assessment of a 2-week follow-up, the participants may rely on walking aids or some help from their family members or others. In Thai traditional culture, children commonly live with or are willing to take care of their ageing parents and thus participants in this study perceived functional ability improvement expectation which was not congruent with functional ability post-operatively due to feeling dependent and needing help from their children. However, this association between functional ability improvement expectation and functional ability was relatively consistent with a systematic review which showed that patients' pre-operative expectations were inconsistently associated with treatment outcomes in PWTJA.[28]

In the final model, quality of care transition subscales were added into the final model; only management preparation dimension was found to be significant predictor of functional ability. Not surprisingly, during admission, not only the clinical pathway was applied to all PWTJA, but also clinical pharmacists were responsible for medication reconciliation, and these factors may have resulted in successful care transitions among PWTJA who were older adults with coexisting chronic illness. Importantly, nursing's role also strengthened the quality of care transition particular to home healthcare. During admission the home healthcare nurses visited, educated, and prepared patients and family members on how to care for patients after discharge to their homes. They also visited patients at their homes on the first three days after discharge to evaluate and help the patient to cope and manage any problems that occurred. This was in agreement with a previous study that found a holistic transitional care program, comprising discharge planning and in-home visiting, led to successful care transition among older adults.[40] Moreover, this service system given to PWTJA in this study helped to provide the comprehensive care which produced overall success.[12,38]

However, other quality of care transition subscales had insignificant predictive powers on functional ability. This may be because the information related to transition care in these subscales was consistent with routine TJA care along with clinical pathway provided to the participants. This led these subscales to have less power than the management preparation subscale to predict functional ability as previously mentioned. This may, at least in part, have lead the quality of care transition to join with functional ability improvement expectation to predict functional ability. Pre-operative physical function was an insignificant predictor of functional ability, which may be because it was suppressed by walking ability, social participation, and management preparation which showed higher predictive power. However, results from this study supported that a triad of structure, process, and outcome components based on Donabedian's model which states that good structure should lead to good process, and in turn promote good outcomes.[18]

Limitations

There were some study limitations which should be acknowledged. Participants were recruited from one tertiary care university hospital, and the majority of participants were persons with TKA. This limits generalizability. Due to a small number of people with THR, analyses to compare functional ability improvement expectation and quality of care transition between TKA and THR were not possible. Regarding functional ability assessment, only a self-reported ADL was used, so it might lead to an over-estimate of outcomes. Moreover, the functional ability improvement expectation questionnaire was new, so psychometric property testing in a large sample sized is needed. In addition, a different type of surgery may influence functional ability even although the patient is encouraged to start early ambulation in performing functional ability early as possible.

Conclusions and Implications for Nursing Practice

This study examined functional ability among patients with TJA over an immediate time point, and predictive power of patients' characteristics, functional ability improvement expectation, and quality of care transition of functional ability. Functional ability improvement expectation (walking and social participation subscales) and quality of care transition (management preparation subscale) were demonstrated to be predictive of functional ability. For a successful recovery from surgery for performing ADL, nurses are key to providing holistic care and need to design preoperative education interventions. These can help patients to develop realistic expectations about treatment outcomes to fulfil their expectations, particularly since walking ability is potentially an important contributor to functional ability in PWTJA. In addition, to help older adults with limited functional ability to maintain their social participation, engaging family-integrated care is pivotal to improving nursing care in PWJA. Moreover, nurses need to communicate and coordinate care not only with patients and their families, but also with health care teams to properly manage preparation for PWTJA during hospitalization. Importantly, in providing transitional care, that is continuing care from hospital through to the home, there is emphasis on professional nursing roles in long-term care management for PWTJA. This will elucidate the benefits to promote quality of transition care successfully and better health outcomes postoperatively.

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References

1. Neogi T. The epidemiology and impact of pain in osteoarthritis. Osteoarthritis and Cartilage. 2013;21(9):1145-1153.
2. Cross M, Smith E, Hoy D, et al. The global burden of hip and knee osteoarthritis: estimates from the Global Burden of Disease 2010 study. Ann Rheum Dis 2014;73:1323-1330.
3. Ferket BS, Feldman Z, Zhou J, Oei EH, Bierma-Zeinstra SM, Mazumdar M. Impact of total knee replacement practice: cost effectiveness analysis of data from the Osteoarthritis Initiative. BMJ. 2017;356:j1131.
4. Daigle ME, Weinstein AM, Katz JN, Losina E. The cost-effectiveness of total joint arthroplasty: a systematic review of published literature. Best Prac Res Clin Rheumatol. 2012;26(5):649-658.
5. Tilbury C, Haanstra TM, Leichtenberg CS, et al. Unfulfilled expectations after total hip and knee arthroplasty surgery: there is a need for better preoperative patient information and education. J Arthroplasty. 2016;31(10):2139-2145.
6. Haynes J, Nam D, Barrack RL. Obesity in total hip arthroplasty: does it make a difference? Bone Joint J. 2017;99-b(1 Supple A):31-36.
7. Loth FL, Giesinger JM, Giesinger K, et al. Impact of comorbidities on outcome after total hip arthroplasty. J Arthroplasty. 2017;32(9):2755-2761.
8. Robbins SM, Rastogi R, McLaughlin TL. Predicting acute recovery of physical function following total knee joint arthroplasty. J Arthroplasty. 2014;29(2):299-303.
9. Smith GH, Johnson S, Ballantyne JA, Dunstan E, Brenkel IJ. Predictors of excellent early outcome after total hip arthroplasty. J Ortho Surg Res. 2012;7:13. doi: 10.1186/1749-799X-7-13.
10. Mahomed NN, Liang MH, Cook EF, et al. The importance of patient expectations in predicting functional outcomes after total joint arthroplasty. J Rheumatol. 2002;29(6): 1273-1279.
11. Allen J, Hutchinson AM, Brown R, Livingston PM. Quality care outcomes following transitional care interventions for older people from hospital to home: a systematic review. BMC Health Serv Res. 2014;14:346. doi: 10.1186/1472-6963-14-346.
12. Ohta B, Mola A, Rosenfeld P, Ford S. Early discharge planning and improved care transitions: pre-admission assessment for readmission risk in an elective orthopedic and cardiovascular surgical population. Int J Integr Care. 2016;16(2):10. doi: 10.5334/ijic.2260.
13. Bachmeier CJ, March LM, Cross MJ, et al. A comparison of outcomes in osteoarthritis patients undergoing total hip and knee replacement surgery. Osteoarthritis and Cartilage. 2001;9(2):137-146.
14. Browne JP BH, Dawson J. What is the optimal time point to assess patient-reported recovery after hip and knee replacement? A systematic review and analysis of routinely reported outcome data from the English patient-reported outcome measures programme. Health Qual Life Outcomes. 2013; 11:128. doi: 10.1186/1477-7525-11-128.
15. Heiberg K, Bruun-Olsen V, Mengshoel AM. Pain and recovery of physical functioning nine months after total knee arthroplasty. J Rehabil Med. 2010;42(7):614-619.
16. WHO. Global strategy and action plan on ageing and health; 2015[cited in 28 July 2018]. Available from http://www.who.int/ageing/GSAP-Summary-EN.pdf

17. Donabedian A. Evaluating the quality of medical care. Milbank Mem Fund Q. 1966; 44(3):suppl: 166-206.
18. Donabedian A. The quality of care. How can it be assessed? JAMA. 1988;260(12):1743-1748.
19. Chun J, Bafford AC. History and background of quality measurement. Clin Colon Rectal Surg. 2014;27(1):5-9.
20. Moore L, Lavoie A, Bourgeois G, Lapointe J. Donabedian's structure-process-outcome quality of care model: validation in an integrated trauma system. J Trauma Acute Care Surg. 2015;78(6):1168-1175.
21. Coyle YM, Battles JB. Using antecedents of medical care to develop valid quality of care measures. Int J Qual Health Care. 1999;11(1):5-12.
22. Brien SE, Dixon E, Ghali WA. Measuring and reporting on quality in health care: a framework and road map for improving care. J Surgical Oncol. 2009;99(8):462-466. doi: 10.1002/jso.21188.
23. Roopsawang I, Belza B. When a care map is not a true predictor of clinical outcomes. J Gerontolol Nurs. 2015; 41(10):5-7. doi: 10.3928/00989134-20150911-22.
24. Guenther D, Schmidl S, Klatte TO, et al. Overweight and obesity in hip and knee arthroplasty: evaluation of 6078 cases. World J Orthop. 2015;6(1):137-144.
25. Jiang Y, Sanchez-Santos MT, Judge AD, Murray DW, Arden NK. Predictors of patient-reported pain and functional outcomes over 10 years after primary total knee arthroplasty: a prospective cohort study. J Arthroplasty. 2017;32(1):92-100.
26. Gonzalez Sáenz de Tejada M, Escobar A, Herrera C, García L, Aizpuru F, Sarasqueta C. Patient expectations and health-related quality of life outcomes following total joint replacement. Value Health. 2010;13(4):447-54. doi: 10.1111/j.1524-4733.2009.00685.x.
27. Cross M, Lapsley H, Barcenilla A, Parker D, Coolican M, March L. Patient expectations of hip and knee joint replacement surgery and postoperative health status. Patient. 2009; 2(1):51-60.
28. Haanstra TM, van den Berg T, Ostelo RW, et al. Systematic review: do patient expectations influence treatment outcomes in total knee and total hip arthroplasty? Health Qual Life Outcomes. 2012;10:152. doi: 10.1186/1477-7525-10-152.
29. Scott CE BK, Clement ND, MacDonald D, Howie CR, Biant LC. Patient expectations of arthroplasty of the hip and knee. J Bone Joint Surg Br. 2012;94(7):974-981.
30. Green UR, Dearmon V, Taggart H. Improving transition of care for veterans after total joint replacement. Orthop Nurs. 2015;34(2):79-86; quiz 87-78.
31. Dossa A, Bokhour B, Hoenig H. Care transitions from the hospital to home for patients with mobility impairments: patient and family caregiver experiences. Rehabil Nurs. 2012;37(6):277-285.
32. Halawi MJ. Outcome measures in total joint arthroplasty: current status, challenges, and future directions. Orthopedics. 2015;38(8):e685-689. doi: 10.3928/01477447-20150804-55.
33. Kunkel S, Rosenqvist U, Westerling R. The structure of quality systems is important to the process and outcome, an empirical study of 386 hospital departments in Sweden. BMC Health Serv Res. 2007;7:104.
34. Coleman EA. Care transition measure (CTM-15); 2006 [cited in 18 August 2017]. Available from http://caretransitions.org/wp-content/uploads/2015/08/CTM-15.pdf
35. Parry C, Mahoney E, Chalmers SA, Coleman EA. Assessing the quality of transitional care: further applications of the care transitions measure. Med Care. 2008;46(3):317-322.
36. WHO. Process of translation and adaptation of instruments. nd; http://www.who.int/substance_abuse/research_tools/translation/en/. Accessed 5 April 2017, 2017.
37. Jitapunkul S, Kamolratanakul P, Ebrahim S. The meaning of activities of daily living in a Thai elderly population: development of a new index. Age Ageing. 1994;23(2):97-101.
38. Lenguerrand E, Wylde V, Gooberman-Hill R, et al. Trajectories of pain and function after primary hip and knee arthroplasty: the ADAPT cohort study. PloS One. 2016;11(2):e0149306. doi: 10.1371/journal.pone.0149306. eCollection 2016.
39. Buirs LD, Van Beers LW, Scholtes VA, Pastoors T, Sprague S, Poolman RW. Predictors of physical functioning after total hip arthroplasty: a systematic review. BMJ Open. 2016;6(9): e010725. doi: 10.1136/bmjopen-2015-010725
40. Naylor MD, Kurtzman ET, Grabowski DC, Harrington C, McClellan M, Reinhard SC. Unintended consequences of steps to cut readmissions and reform payment may threaten care of vulnerable older adults. Health Aff (Millwood). 2012;31(7):1623-1632.

ปัจจัยทำนายความสามารถในการทำกิจกรรมของผู้สูงอายุที่ได้รับการผ่าตัดเปลี่ยนข้อสะโพกและข้อเข่าเทียม

สุภาพ อารีเอื้อ อินทิรา รูปสว่าง วิโรจน์ กวินวงศ์โกวิท*

บทคัดย่อ: การผ่าตัดเปลี่ยนข้อเทียมถือเป็นมาตรฐานการรักษาเพื่อลดอาการปวดข้อเรื้อรัง เพิ่มประสิทธิภาพการทำงานของข้อ รวมทั้งคุณภาพชีวิตของผู้สูงอายุที่มีปัญหาข้อเสื่อม ความคาดหวังในผลลัพธ์หลังผ่าตัดและคุณภาพการดูแลขณะเปลี่ยนผ่าน เป็นประเด็นสำคัญที่เกี่ยวข้องกับการฟื้นสภาพของผู้ป่วยหลังผ่าตัด การศึกษาแบบไปข้างหน้าในครั้งนี้มีวัตถุประสงค์เพื่อศึกษาปัจจัยทำนายความสามารถในการทำกิจกรรมของผู้สูงอายุหลังได้รับการผ่าตัดเปลี่ยนข้อสะโพกและข้อเข่าเทียม 2 สัปดาห์ กลุ่มตัวอย่างคือผู้สูงอายุที่เข้ารับการผ่าตัดเปลี่ยนข้อสะโพกและข้อเข่าเทียมจำนวน 95 ราย เก็บข้อมูลด้วยแบบสอบถามข้อมูลส่วนบุคคลและข้อมูลสุขภาพ แบบสอบถามความคาดหวังความสามารถในการทำกิจกรรมหลังผ่าตัด แบบสอบถามคุณภาพการดูแลขณะเปลี่ยนผ่าน และแบบประเมินความสามารถในการทำกิจวัตรประจำวัน วิเคราะห์ข้อมูลด้วยสถิติบรรยาย วิเคราะห์ความสัมพันธ์ของเพียร์สัน และวิเคราะห์ถดถอยพหุคูณแบบเชิงชั้น

ผลการศึกษาพบว่า ผู้สูงอายุกลุ่มตัวอย่างมีระดับความสามารถในการทำกิจกรรมสูง ขณะมาติดตามการรักษา 2 สัปดาห์หลังได้รับการผ่าตัด ความคาดหวังความสามารถในการทำกิจกรรมหลังผ่าตัด และคุณภาพการดูแลขณะเปลี่ยนผ่านมีความสัมพันธ์ทางบวกกับความสามารถในการทำกิจกรรมหลังผ่าตัด 2 สัปดาห์ ในขณะที่ปัจจัยลักษณะส่วนบุคคลของกลุ่มตัวอย่างมีความสัมพันธ์กับความสามารถในการทำกิจกรรมอย่างไม่มีนัยสำคัญทางสถิติ ความคาดหวังความสามารถในการทำกิจกรรมหลังผ่าตัดด้านความสามารถในการเดินและด้านการมีส่วนร่วมทางสังคม และคุณภาพการดูแลขณะเปลี่ยนผ่านด้านการเตรียมการจัดการการดูแลเป็นตัวแปรทำนายและร่วมกันทำนายโดยอธิบายความแปรปรวนความสามารถในการทำกิจกรรมของผู้สูงอายุหลังผ่าตัดเปลี่ยนข้อสะโพกและข้อเข่าเทียม 2 สัปดาห์หลังได้รับการผ่าตัด ร้อยละ 36.9 ผลการศึกษานี้ช่วยให้พยาบาลออกแบบกิจกรรมการพยาบาลที่เน้นการช่วยให้ผู้ป่วยมีความคาดหวังความสามารถในการทำกิจกรรมตรงกับความเป็นจริงหลังการผ่าตัดเปลี่ยนข้อเทียมโดยเฉพาะความสามารถในการเดินและการมีส่วนร่วมในสังคม และการประสานการดูแลทั้งผู้ป่วยและญาติ รวมถึงทีมสุขภาพในการจัดการการดูแลผู้ป่วยอย่างเหมาะสม อันจะนำไปสู่การพัฒนาคุณภาพการพยาบาลและผลลัพธ์ทางคลินิก

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Cross-cultural Instrument Translation and Adaptation: Challenges and Strategies

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Abstract: Over the decades, cross-cultural research has been conducted to increase understanding of health and illness phenomena across different cultures and populations. However, researchers are faced with issues of translation from the source language to the target language, even with instruments developed for use in cross-cultural research. Therefore, the process of translation is a crucial one in order to maintain the conceptual, content, semantic, and construct equivalences across the two languages and cultures which is essential for credibility of the measurement results. The purpose of this article is to describe the process of the translation and cross-cultural adaptation of the Falls Efficacy Scale-International. It was translated into Thai using ten steps, including translation and back-translation as well as checking with experts and the target audience to assure cultural equivalence. Challenges with some wordings and cultural differences in daily life were identified and addressed with strategies to manage them so that an appropriate version of the tool was developed and ready for future research with community-dwelling Thai older adults.

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Introduction

Cross-cultural research has dramatically increased due to an interest in understanding health phenomena and/or experience of health and illness across different cultural populations and ethnic groups. Conducting cross-cultural studies has long been recommended as researchers can reference a concept or construct of interest across cultures and directly compare the findings across studies from different cultures and countries.[1,2] However, in doing so, researchers must translate instruments from the source language, usually English, to the language of the target population. One of the goals of instrument translation is to achieve cross-cultural conceptual, semantic, and content equivalences for the constructs or concepts of interest.[1-4] Without these equivalences, differences and/or similarities in the results gathered from cross-cultural research may be due to errors in translation rather than from cultural differences.[5, 6]

Even if an instrument was developed for use in cross-cultural research, researchers still face the challenges of instrument translation. For example, forward translators could select wording in target languages that does not have the same meaning as in the original language.[7-9] This is because the terms, and meaning of the concept or constructs being studied may differ among languages, cultures, and countries.[1,7-9] Therefore, the process of translation is a crucial one. The comprehensive process of instrument translation should include not only translation of the instrument, but also cultural adaption of each item to the target culture while retaining the meaning and intent of the original items.[1,10-12] The purpose of this article is to discuss cross-cultural instrument translation methods, as well as challenges and strategies encountered during a study to translate the Fall Efficacy Scale-International (FES-I) into Thai.

Cross-cultural Instrument Translation Methods

There are two kinds of instrument development methods commonly used in cross-cultural research.[11] In the first instance, an instrument is developed for use in two languages, with an assumption that neither language is a source language. The items are modified in an ongoing reciprocal process thereby providing the opportunity to align the two versions closely. In the second example, researchers rather than developing a new instrument, researchers instead use a previously developed and validated instrument and adapt it for use in a target culture and language.[11] The latter is more commonly used.[8,11,13]

The simplest method for instrument translation is forward translation from the original to the new language. This method is simple, but can raise questions related to the quality of the translation, thus threatening the validity of the instrument as well as the research findings since the source and the target versions may lack semantic and content equivalences.[11,14] In order to improve equivalences between the source and target languages, Brislin[14,15] recommended cross-cultural researchers add one or more of the following techniques when translating an instrument: (a) use of a bilingual translator to translate the instrument from the source to the target language, (b) use of another bilingual translator back-translation of the instrument, (c) use of bilinguals to test both the source and target language versions, or (d) testing of the translated version with participants of the target population to be studied. Brislin[15] developed a process for cross-cultural research that has been adopted by many researchers.[16,17] To begin the process of back translation, someone who is bilingual translates the instrument from the source (original) to the target (local) language. Then, a different person who is bilingual translates the instrument back from the target to the source language. The new back-translated version and the original version are compared for similar words and meaning. Ideally, this is done by a researcher familiar with the instrument and content area. This process can be repeated if needed to improve comparability of the back-translated version to the original version. Each bilingual translator works independently. The last back-translated version must be compare with the original version by a monolingual person whose primary language is the language used in the original version,[12,18] and should be the developer of the original instrument if he or she is available.[10,18] The researcher then compares the last back-translated version with the original version. If an error in meaning is found, the process is repeated again until both versions are equivalent.[15]

In a recent review of translation process methods used in cross-cultural research, Maneesriwongul and Dixon[5] found that the most widely used translation methods were forward-only translation, forward-only translation with testing, back translation, back translation with monolingual testing, back translation with bilingual testing, and back translation with both monolingual and bilingual testing, respectively. They recommended that the standard method for cross-cultural research should include at least one back translation, followed by testing with target language participants.

In this study, a rigorous back translation process was used to develop a cross-cultural version of a measure falls self-efficacy, the Falls Efficacy Scale-International (FES-I)[19] for use with Thai older adults. The following describes the translation and cross-cultural adaptation using this method, as well as challenges encountered and recommendations for other researchers.

The Falls Efficacy Scale-International (FES-I)

Fear of falling is increasingly recognized as a significant problem in older adults, leading to activity restriction, disability, and increased risk of falls.[20-22] As a result, measurement of fear of falling is common in studies related to falls, frailty, and activity among older adults. Fear of falling is often assessed using the related concept of falls efficacy. Falls efficacy was originally conceived as confidence in performing different daily activities without falling by Tinetti, Richman, & Powell[23], who developed the 10-item Falls Efficacy Scale (FES). The FES-I is an adaptation later developed by researchers with the Prevention of Falls Network Europe (ProFaNE) for use in a wide range of cultural settings.[19] The FES-I consists of 16 items, including the 10 items from the original FES.[23] Six additional items were selected from literature to provide a wider range of more difficult activities based on review of the other measures.

The final version of the FES-I assesses concern about the possibility of falling while performing of sixteen common activities.[19] Each activity is scored from 1 (not at all concerned) to 4 (very concerned) points, providing a total score ranging from 16 (absence of concern) to 64 (extreme concern). A higher score indicates higher concern. On testing in the United Kingdom, the instrument showed excellent internal consistency and test-retest reliability (Cronbach's alpha coefficient = 0.96, Intraclass Correlation Coefficient (ICC) = 0.96).[19] A cross-cultural validation of the FES-I indicated positive psychometric properties in Germany (n=94), the Netherlands (n=193), and the United Kingdom (n=178). The Cronbach's alpha coefficients were 0.90, 0.96, and 0.97, respectively and the ICCs were 0.79, 0.82, and not available, respectively.[24]

The FES-I has been translated and has excellent psychometric properties across a variety of languages and countries including, Sweden[25], Brazil[26], Italy[27], Greece[28], Spain[29], Turkey[30], Arabic[31], Hungarian[32], and Chinese.[33] Although the FES-I has been adapted for several countries, a translation use in Thailand had not been posted by the ProFaNE group. While the FES-I was translated into Thai language before[34], the researcher reported using the term "fear of falling" instead of "concern of falling" in her questionnaire, as required by the ProFaNE group. The word "fear" had created issues in past testing of measures of fear of falling. As a result, the purpose of this study was to translate the FES-I into a culturally appropriate Thai language version based on the ProFaNE guideline and process for use in future fear of falling research.

Methods

After the first author (SP) received permission from the ProFaNE group, the process of translation and cultural adaption of the FES-I was conducted according to their ten-step translation protocol.[35] This translation protocol was congruent with the translation process recommended by Brislin.[4, 15] The English version provided the original language. The process for translation and cross-cultural adaptation follows.

Translation and Cross-Cultural Adaptation Process

Before beginning, the authors selected translators. The authors carefully discussed the selection because one of the keys of successful translation in cross-cultural research is translator qualification.[4] According to the literature review, forward translators from the source to the target language should be conducted by persons fluent in both languages and cultures.[16, 17, 36] Ideally, they have different backgrounds, are knowledgeable about and familiar with the construct or concept being measured, and know how the instrument will be used. Conversely, back translators should be blinded to the original instrument being translated and should be unaware of the intent and the concept or context being studied. All translators should work independently.[2-4, 6, 16, 36] If possible, and the translator team should include translators who speak different variations or dialects of the same language.[3]

After consulting the literature review and the ten-step translation protocol of the FES-I, five bilingual translators were selected, including three forward translators and two back translators. Since the FES-I was developed to be suitable for translation for use in a variety of cultural contexts and languages, the English wording contained in the FES-I was not sophisticated. Hence, three bilinguals Thai doctoral students studying in the United States who were native Thai speakers with different backgrounds (one specializing in psychiatric nursing, and two in adult and older adult nursing), and were familiar with the concept of fear of falling were selected.

The two back translators were also bilingual: one had English as a first language, and the other had Thai as a first language. One of two back translators was a professional translator of Thai nationality. She was born, grew up, and earned her education through a doctoral degree in the United States. Although her native language was English, she can read and write in Thai since she used Thai language in her home and had worked in Thailand. The other back translator was a retired Thai older adult living in the United States. She spent the first half of her life in Thailand, and then earned her master's and doctoral degrees and worked in the United States.

Next, the instructions for translators[37] were provided to the three forward translators in order to enhance conceptual, semantic, and content equivalences between the FES-I and the FES-I (Thai) versions.[2, 18] Then, they independently translated the original FES-I into Thai language. In the second step, a first meeting of forward translators was held in order to identify differences and discrepancies between the three translated versions, and to solve any problems through discussion and consensus. These steps yielded a provisional FES-I (Thai) version. As a first step in evaluating this version, each forward translator selected two Thai older adults living in the United States to evaluate the provisional FES-I (Thai) version. Each older adult filled out the provisional version separately. The forward translators then asked the older adults about the clarity, comprehensibility, appropriateness, and comprehensiveness of each item in the provisional version. Then, the forward translators met again in order to discuss and modify the wording of the provisional version based on the older adults' feedback. This step resulted in a second provisional version.

In the next step, the second provisional version was back translated by two back translators who were blinded to the original FES-I, and were not aware of the intent or the concept and context of fear of falling. A third meeting of the forward translators was then held to review both back-translation versions. The discrepancies between the translated versions were evaluated and noted. As an additional step, all three English versions (the original and the two back-translated versions) were examined by another author (HL). She is an expert in the area of fear of falling and monolingual in English. Any inconsistencies were identified, discussed with the back translators, and a consensus reached by the authors. Then, the pre-final FES-I (Thai) version was established.

The pre-final FES-I (Thai) version was reviewed by six monolingual Thai community-dwelling older adults living in Thailand, the target population for future studies. The purpose was to examine the clarity and linguistic appropriateness of the pre-final FES-I (Thai) version, and to ensure that future participants could comprehend all the questions and procedure for administration. Because the authors were not in Thailand at the time, the first author (SP) contacted a nurse working in a community hospital who worked with Thai older adults who agreed to administer the FES-I (Thai) version. The nurse was oriented to the project, and worked with an older adults' club in her community to find older adults to volunteer to fill out a questionnaire and discuss it. They independently reviewed and filled out the questionnaire. Afterwards, she asked them about the clarity of each item and identified any words or phrases that they did not understand, were difficult to comprehend, or inappropriate.

Results

While the translation process worked well, there were some challenges encountered during the project that were solved. During the first step, the forward translators had some difficulty finding an appropriate match for some English words in the Thai language. For example, they noted that the word "concerned" was translated into three different Thai words. One translator used a Thai word with a meaning close to "worried," even though all translators were provided the FES-I direction that the term "concerned" should be used to express a cognitive uneasiness about the possibility of falling, rather than emotional distress that would be expressed in terms of "worried", "anxious", or "fearful." This problem was solved during their consensus meeting.

Another item was modified by a consensus among the forward translators due to differences in Thai culture: "taking a bath or shower." This was translated into Thai as "taking a bath." The Thai rarely have a bathtub in their homes, so bathing is typically done by taking a shower. After the first meeting, there were no other changes to items or words apart from those mentioned, and the provisional version of the FES-I (Thai) version was created.

This provisional version was reviewed with six Thai older adults living in the United States. Then a second meeting of the forward translators was held to discuss their comments. None of the participants in this initial group reported a problem with any item in the provisional version or gave any suggestions; thus, the first provisional version was not revised.

When the back-translated English versions were reviewed and compared to the original, the wording of one item appeared awkward in English. The original item, "walking up and down a slope" appeared as "walking up and down the steep or ramp" in the back-translated version. The back translator was contacted. She explained that the terms "steep or ramp" meant a slope, but she used these other words because they were more appropriate and familiar terms in the Thai language and context than the word "slope." Therefore, after discussion with the forward translators, their wording was retained since it used was determined to have a meaning closer to the original English version. Therefore, the authors concluded that although the original FES-I and one of the back-translated versions was a bit different in linguistic equivalence, the three English versions revealed semantic and content equivalence since the meaning was maintained. A pre-final FES-I (Thai) version was developed.

The pre-final FES-I (Thai) version was reviewed by six Thai community-dwelling older adults living in a Thai rural area. After completing the questionnaire, the older adults were asked "What do you think this questionnaire asks?" They all answered that the questionnaire asked about their concern about the possibility of falling when doing each activity. While participants reported that the items were clear and understandable, they also preferred to have the questions administered by interview, rather than filling out the questionnaires themselves. This is because they were confused about which column they should check to answer each question. When the nurse compared the answers on the questionnaire to the older adults' verbal answers, she found that the older adults did not always check the correct column. For example, one person answered that she was very concerned, but she checked the "not concerned" column. Other than this suggestion, no words or items were reworded or modified, and the final FES-I (Thai) version was created.

Discussion

In this study, the FES-I was translated and adapted into Thai context in terms of both semantic and cultural aspects. While completing the forward translation, team members had difficulty finding some Thai words that would retain meaning and conceptual equivalence to the original FES-I. This occurred even though the original FES-I was created for use in cross-cultural research, and guidelines were provided to the three forward translators in order to enhance conceptual, semantic, and content equivalence between the original FES-I and new versions. Our experience is congruent with results from previous research related to both instrument translations and the translation and cross-cultural adaptation of the FES-I.[6, 26, 30, 36, 38] Specially, our findings are in accordance with the finding of Camargos and colleagues[26] in Brazil who also encountered difficulty with cultural equivalence of the terms either bath or shower. The strategies recommended by Brislin[15] and ProFaNE[37] methods provide a rigorous process for identifying and resolving cross-cultural differences and is recommended for other researchers.

While we were able to find translators, some researchers report that the most difficult challenge for researchers using Brislin's back translation method is finding enough bilingual persons to run such the process.[1, 13, 17] Hence, an alternative way is to use only two independent bilingual translators, one to translate and one to back-translate.[17] However, the back translation can look adequate, even when it isn't. This is because a good or expert translator can achieve semantic and content equivalence between the source and the back-translated versions, even if the translation from the source to the target language is poor.[5, 6, 11] Additionally, the back translation process is time consuming and may be costly. Researchers may have limited resources (e.g., time, budget, and accessibility and availability of bilingual persons) along with the fact that none of aforementioned instrument translation techniques is perfect. Therefore, a combination of techniques should be used for instrument translation in cross-cultural research.[1, 4, 8, 18]

In this study, it also was found that having a reviewer who is an additional reviewer who was a native monolingual English speaker and expert in the area of fear of falling, along with previously mentioned multi-step translation process and testing enhanced the cross-cultural conceptual, semantic, and content equivalence between the original FES-I and the FES-I (Thai) versions. This was evidenced because in the third meeting, the three forward translators did not notice the minor differences between the original and back-translated versions. It took an expert who is a monolingual native speaker of English to identify minor discrepancies. It may be that the four translators (3 forward translator and one back translator who spent her first half of her life in Thailand before moved to the US) shared a common worldview owing to similar background, and the three forward translators were not as fluent in words commonly used in the English language, such as colloquial phrases or jargon.[2, 18] Therefore, the strategy of having a monolingual native English speaker examines all English versions helped to identify discrepancies between the original and the back-translated versions.[5, 17]

Input from Thai community-dwelling older adults who were representative of future study participants helped to verify the clarity and appropriateness of the Thai version. This strategy is recommended to enhance the cross-cultural conceptual, semantic, and content equivalence, and to identify potential problems related to administration of this instrument in further research.[2, 4, 5, 15, 17] The authors could anticipate that future participants would be able to comprehend the questions on the instrument and answer appropriately. Study to test whether measurement equivalence or psychometrics properties of the Thai FES-I are the same as the original and other translated versions is needed.[39]

Thai older adults preferred to be interviewed rather than fill out the questionnaire. Based on the first author's experience and a discussion with the nurse working with Thai older adults, we concluded that those living in rural areas might be not familiar with filling out a questionnaire. There is evidence of this in that when older adults go to the hospital and have to fill out any health forms, the majority of older adults ask nurses or other individuals to read it to them. Researchers anticipating this strategy will need to consider the added time and resources needed to collect data by interview with older adults rather than having participants complete questionnaires on their own.

Conclusion

In the present study, authors complete the translation of the FES-I into a culturally and semantically appropriate instrument to measure falls efficacy relate to fear of falling in community-dwelling Thai older adults using Brislin's and ProFaNE's process and strategies. The findings of this study revealed that the FES-I (Thai) version was demonstrated to have cross-cultural conceptual, semantic, and content equivalence with the original FES-I, with some minor adaptations. Further research with larger samples will be done to determine the psychometric properties of the measure and explore fear of falling more fully in Thai older adults.

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References

1. Jones E. Translation of quantitative measures for use in cross-cultural research. Nurs Res. 1987;36(5):324-7.
2. Waltz CF, Strickland OL, &, Lenz ER. Measurement in nursing and health research. 5th ed. New York: Springer; 2016.
3. Willgerodt MA, Kataoka-Yahiro M, Kim E, Ceria C. Issues of instrument translation in research on Asian immigrant populations. J Prof Nurs. 2005;21(4):231-9.
4. Brislin RW. Back-translation for cross-cultural research. J Cross Cult Psychol. 1970;1(3):185-216.
5. Maneesriwongul W, Dixon JK. Instrument translation process: a methods review. J Adv Nurs. 2004;48(2):175-86.
6. Wang WL, Lee HL, Fetzer SJ. Challenges and strategies of instrument translation. West J Nurs Res. 2006;28(3):310-21.
7. Hoben M, Mahler C, Bar M, Berger S, Squires JE, Estabrooks CA, et al. German translation of the Alberta Context Tool and two measures of research use: methods, challenges and lessons learned. BMC Health Serv Res. 2013;13:478.
8. Khalaila R. Translation of questionnaires into Arabic in cross-cultural research: techniques and equivalence issues. J Transcult Nurs. 2013;24(4):363-70.
9. Ljungberg AK, Fossum B, Furst CJ, Hagelin CL. Translation and cultural adaptation of research instruments - guidelines and challenges: an example in FAMCARE-2 for use in Sweden. Informatics for health & social care. 2015;40(1):67-78.
10. Sousa VD, Rojjanasrirat W. Translation, adaptation and validation of instruments or scales for use in cross-cultural health care research: a clear and user-friendly guideline. J Eval Clin Pract. 2011;17(2):268-74.
11. Sperber AD. Translation and validation of study instruments for cross-cultural research. Gastroenterology. 2004;126(1 Suppl 1):S124-8.
12. Wong-Anuchit C, Mills AC, Schneider JK, Rujkorakarn D, Kerdpongbunchote C, Panyayong B. Internalized stigma of mental illness scale - Thai version: translation and assessment of psychometric properties among psychiatric outpatients in central Thailand. Arch Psychiatr Nurs. 2016;30(4):450-6.
13. Chan DNS, So WKW. Translation and validation of translation in cross-cultural research: Strategies used in a study of cervical cancer screening among ethnic minorities. Int J Nurs Pract. 2017;23(6).
14. Jones E, Kay M. Instrumentation in cross-cultural research. Nurs Res. 1992;41(3):186-8.

15. Brislin RW. The wording and translation of research instruments. In: (Eds.) WLLJWB, editor. Field methods in cross-cultural research. Beverly Hills: Sage Publications; 1986. p. 137-64.
16. Jones P, Lee J, Phillips L, Zhang X, Jaceldo K. An adaptation of Brislin's translation model for cross-cultural research. Nurs Res. 2001;50(5):300-4.
17. Cha ES, Kim KH, Erlen JA. Translation of scales in cross-cultural research: issues and techniques. J Adv Nurs. 2007;58(4):386-95.
18. Hilton A, Skrutkowski M. Translating instruments into other languages: development and testing processes. Cancer Nurs. 2002;25(1):1-7.
19. Yardley L, Beyer N, Hauer K, Kempen G, Piot-Ziegler C, Todd C. Development and initial validation of the Falls Efficacy Scale-International (FES-I). Age Ageing. 2005;34(6):614-9.
20. Jefferis BJ, Iliffe S, Kendrick D, Kerse N, Trost S, Lennon LT, et al. How are falls and fear of falling associated with objectively measured physical activity in a cohort of community-dwelling older men? BMC Geriatr. 2014;14 (114):1-9.
21. Lavedan A, Viladrosa M, Jurschik P, Botigue T, Nuin C, Masot O, et al. Fear of falling in community-dwelling older adults: A cause of falls, a consequence, or both? PLoS One. 2018;13(5):e0197792.
22. Denkinger MD, Lukas A, Nikolaus T, Hauer K. Factors associated with fear of falling and associated activity restriction in community-dwelling older adults: a systematic review. Am J Geriatr Psychiatry. 2015;23(1):72-86.
23. Tinetti ME, Richman D, Powell L. Falls efficacy as a measure of fear of falling. Journals of Gerontology. 1990;45(6):239-43.
24. Kempen GI, Todd CJ, Van Haastregt JC, Zijlstra GA, Beyer N, Freiberger E, et al. Cross-cultural validation of the Falls Efficacy Scale International (FES-I) in older people: results from Germany, the Netherlands and the UK were satisfactory. Disabil Rehabil. 2007;29(2):155-62.
25. Nordell E, Andreasson M, Gall K, Thorngren KG. Evaluating the Swedish version of the Falls Efficacy Scale-International (FES-I). Advances in Physiotherapy. 2009;11(2):81-7.
26. Camargos FF, Dias RC, Dias JM, Freire MT. Cross-cultural adaptation and evaluation of the psychometric properties of the Falls Efficacy Scale-International Among Elderly Brazilians (FES-I-BRAZIL). Rev Bras Fisioter. 2010; 14(3):237-43.
27. Ruggiero C, Mariani T, Gugliotta R, Gasperini B, Patacchini F, Nguyen HN, et al. Validation of the Italian version of the falls efficacy scale international (FES-I) and the short FES-I in community-dwelling older persons. Arch Gerontol Geriatr. 2009;49 Suppl 1:211-9.
28. Billis E, Strimpakos N, Kapreli E, Sakellari V, Skelton DA, Dontas I, et al. Cross-cultural validation of the Falls Efficacy Scale International (FES-I) in Greek community-dwelling older adults. Disability and Rehabilitation. 2011;33(19-20):1776-84.
29. Lomas-Vega R, Hita-Contreras F, Mendoza N, Martínez-Amat A. Cross-cultural adaptation and validation of the falls efficacy scale international in Spanish postmenopausal women. Menopause: The Journal of The North American Menopause Society. 2012;19(8):904-908.
30. Ulus Y, Durmus D, Akyol Y, Terzi Y, Bilgici A, Kuru O. Reliability and validity of the Turkish version of the Falls Efficacy Scale International (FES-I) in community-dwelling older persons. Arch Gerontol Geriatr. 2012;54(3):429-33.
31. Halaweh H, Svantesson U, Rosberg S, Willen C. Cross-cultural adaptation, validity and reliability of the arabic version of the falls efficacy scale-international (FES-I). Med Princ Pract. 2016;25(1):1-7.
32. Kovacs E, Rozs F, Petridisz A, Erdos R, Majercsik E. Cross-cultural validation of the Falls Efficacy Scale-International to assess concerns about falls among Hungarian community-living older people. Disabil Rehabil. 2017:1-6.
33. Kwan MM, Tsang WW, Close JC, Lord SR. Development and validation of a Chinese version of the Falls Efficacy Scale International. Arch Gerontol Geriatr. 2013;56(1): 169-74.
34. Thiamwong L. Psychometric Testing of the Falls Efficacy Scale-International (FES-I) in Thai older adults. Songklanakarin medical journal. 2011;29:277-87.
35. ProFaNE. Ten step FES-I translation protocol 2012. Available from: http://www.profane.eu.org/documents/Ten_step_translation_protocol.pdf.

36. Beck CT, Bernal H, Froman RD. Methods to document semantic equivalence of a translated scale. Res Nurs Health. 2003;26(1):64-73.
37. ProFaNE. FES-I Translators'/Interviewers' notes. 2012.
38. Yu DS, Lee DT, Woo J. Issues and challenges of instrument translation. West J Nurs Res. 2004;26(3):307-20.
39. Streiner DL, Norman GR, & , Cairney J. Health measurement scales: A practical guide to their development and use. 5th ed. United Kingdom: Oxford University Press; 2015.

การแปลและปรับเนื้อหาของเครื่องมือวิจัยข้ามวัฒนธรรม: ความท้าทายและกลยุทธ์

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บทคัดย่อ: ในช่วงหลายทศวรรษที่ผ่านมาได้มีการทำวิจัยข้ามวัฒนธรรมมาตลอด เพื่อช่วยเพิ่มความเข้าใจปรากฎการณ์ของภาวะสุขภาพและความเจ็บป่วยในประชากรที่มีความแตกต่างทางวัฒนธรรมและชาติพันธุ์ แต่อย่างไรก็ตามนักวิจัยยังคงประสบปัญหาเกี่ยวกับการแปลเครื่องมือวิจัยจากภาษาดั้งเดิมไปเป็นภาษาเป้าหมายถึงแม้ว่าเครื่องมือวิจัยนั้นจะถูกสร้างมาสำหรับใช้ในการวิจัยข้ามวัฒนธรรมก็ตาม ดังนั้นกระบวนการแปลจึงเป็นขั้นตอนที่สำคัญมากขั้นตอนหนึ่งเพื่อรักษาความเทียบเท่ากันด้านแนวคิด เนื้อหา ความหมายและโครงสร้างของทั้งภาษาดั้งเดิมและภาษาเป้าหมาย ซึ่งเป็นส่วนสำคัญต่อความน่าเชื่อถือของผลที่ได้จากเครื่องมือวิจัยที่ถูกแปลมา วัตถุประสงค์ของบทความนี้คือนำเสนอขั้นตอนการแปลและปรับให้เข้ากับวัฒนธรรมของแบบประเมินความเป็นกังวลว่าจะหกล้มฉบับนานาชาติ ซึ่งแบบประเมินความเป็นกังวลว่าจะหกล้มฉบับนานาชาติได้ถูกแปลเป็นภาษาไทยโดยกระบวนการแปล 10 ขั้นตอน ประกอบไปด้วยการแปลจากภาษาอังกฤษเป็นภาษาไทย การแปลย้อนกลับ การเปรียบเทียบเครื่องมือวิจัยต้นฉบับกับชุดที่แปลย้อนกลับโดยผู้ทรงคุณวุฒิ และการทดสอบเครื่องมือโดยกลุ่มตัวอย่างที่มีลักษณะทางประชากรเหมือนกลุ่มเป้าหมายงานวิจัย เพื่อให้แน่ใจว่าเครื่องมือที่แปลมานั้นมีความเทียบเท่าเชิงวัฒนธรรม รวมทั้งนำเสนอความท้าทายจากการใช้คำและวัฒนธรรมในชีวิตประจำวันที่แตกต่างกัน ดังนั้นแบบประเมินความเป็นกังวลว่าจะหกล้มฉบับภาษาไทยจึงมีความเหมาะสมและพร้อมแล้วที่จะถูกนำไปศึกษาวิจัยต่อไปในอนาคต

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Burden of Diseases among Nursing Staff in a Tertiary Hospital in Thailand

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Abstract: Nurses form the majority of the workforce for health care systems globally, but they face challenges including high turnover and mal-distribution. As a result of heavy workload, they experience health problems and burnout. This cross-sectional study measured the impact of illnesses among nursing staff at a tertiary hospital in Thailand. In July 2015, 780 staff members of the nursing department including registered nurses, nurse assistants and patient assistants, were asked to complete two parts of self-reported questionnaires including demographic data and prevalence and incident of diseases occurring during 2014. The number of deaths was collected from the human resource department. Disability weights and disease duration were derived from the Thai Burden of Diseases study and international resources. The total disease burden was calculated using an organizational perspective based on the Disability-Adjusted Life Years.

Our results showed that total disease burden among nursing staff at the hospital in 2014 was 48.3 Disability-Adjusted Working Years. The Years of Working with Disability was 48.2% of total disease burden. The top three leading causes of disease burdens were ovarian cancer, 45.8% anxiety disorders 14.6%, and osteoarthritis 13.9%. Anxiety comprised the highest nonfatal cause which occurred mostly among younger nurses and those working in the inpatient wards. Cancer was the only fatal disease, incurring the largest burden, and accounting for 51.8% of total disease burden. Our finding raises attention to psychological conditions occurring among the young and inpatient wards and musculoskeletal disorders. It suggested that further investment to improve working conditions and support for nursing staff should be done. Moreover, patient handling and ergonomic training programs for nursing students could be included in the nursing curriculum, as well as refresher courses for employed nurses.

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Introduction

Nurses are the largest workforce contributors to health care in most countries. They face shortages, intention to leave their careers[1] and inequitable distribution.[2] This problem is being taken into account through strengthening the World Health Organization's global strategy for using health resources.[3] Despite this, a study concerning the relationship between the nursing shortage and work outcome revealed that the current shortage among nursing staff has resulted in a heavy workload for the remaining staff.[4] Therefore, this can directly cause stress and burnout and lead to low job satisfaction.[4]

Nursing professionals play a significant role in the health care system. Normally, they serve as primary and specialty care providers for patients, but nurses work under risky conditions or environments that incur needle stick and other penetrating injuries.[5] In addition, nurses work long hours and have to take care of patients regarding repetitive activities. This can result in nursing professionals experiencing work-related illnesses such as musculoskeletal disorders.[6] According to a study among registered nurses in Thailand, musculoskeletal diseases were the most common health problems followed by dyslipidemia, hypertension and viral hepatitis. Clinical nurses experienced insomnia and job strain more than nonclinical nurses.[7]

In Thailand, about 90% of nurses take care of patients, while 10% work in other fields such as education, research and management.[8] Approximately 15.4% of Thai nurses aim to leave their job and 11.2% plan to leave in the next 2 years.[1] A total of 3.3% leave the job before retirement age. Hospital management should place importance concerning these critical problems as well as burnout and heavy workload impact on the remaining nurses' health. One of the ways to support nursing staff is to take care of their health. This includes not only helping nursing staff to be healthy and work more efficiently but also saving the hospital health expenditures more effectively. However, we should select reliable indicators to measure the impact on their health to prioritize best practices in the hospital setting.

In the past decade, traditional population health indicators such as the number of death,[9] the incidence of illness, do not combine the impact of nonfatal outcomes of disease and illness conditions with the impact from early death. Disability-Adjusted Life Years (DALYs) was first introduced in the Global Burden of Diseases (GBD) study conducted in 1993 to estimate the impact on both premature death and disability in a single unit as "time" allows comparison across population subgroups at the population level.[10] This summary measure of population health is helpful in priority-setting in the health sector as well as useful in evaluating the cost-effectiveness of interventions in terms of cost per unit of disease burden averted.[9]

However, to estimate the magnitude of health impact on nursing staff at working age, we modified the calculation of DALY to estimate the burden of disease based on an "organizational perspective", not a population perspective as in the GBD study. The burden of disease in the GBD study is calculated using the life expectancy at birth; 82.5 years for female and 80.0 years for men.[9] This may be an overestimate in an employer's point of view. So, in this study we captured only the impact of diseases that happened during the working period before retirement age. The objective of this study was to understand disease burden among nursing staff in a tertiary hospital using employer's perspective. The proposed measure combines disease burden from both mortality and morbidity into a single measurement unit. It can support organization design and management by comparing diseases across population groups, e.g., disease category, age groups, hospital ward and disease group. Moreover, this new measure can be used to assess the cost-effectiveness of interventions for prevention in the future.

Conceptual Framework and Literature Review

Traditional population health measures were designed in a period when majority of health burdens were related to acute illnesses or diseases and so, their focuses were mainly on the incidence or prevalence of disease or mortality. For example, the number or incidence of death, is not practical for policy makers these days because this does not consider non-fatal health outcomes which are more predominant in the age of chronic and non-communicable diseases.

Disability Adjusted Life Years (DALYs) is a concept to measure the health gap between an unhealthy population and a healthy population without disease. DALYs are population-based measures that combine the impacts of premature death and disability as a unit of measurement in the number of health year loss.[9] There are two related studies which applied the DALY concept to estimate the impact of diseases in working people including General Motors (GM)[11] and North American Industrial Classification System (NAICS) code 113310 in the LCA study.[12] Both studies calculated the disease burden using the life expectancy at birth of the population sampled. This may be an overestimate in the employer perspective because they might include the impact of elderly diseases while employees have worked in an organization until their retirement. However, little has been done to quantify the disease burdens of health workers.

This study used the concept of quality of life (QoL) and population health metrics similar to DALY. The main difference from DALY in this study is that it uses an organizational perspective. Based on the latter, as researchers we focused on the healthy time lost while in productive working years. Our measure considers the burden of disease to an organization by combining years of working with disability (YWD) and years of work lost (YWL) due to premature mortality before retirement age. It includes loss from any diseases or conditions that happened during employment. For example, when applied to nursing personnel it means any loss that occurred during the period from the start of work in the hospital until retirement age or between 20-22 until 60 years of age, a shorter time period than what is used in the calculation of DALYs.

Aim of Study: To understand disease burden among nursing staff in a tertiary hospital using the employer's or the organization's perspective.

Methods

Design: A cross-sectional study.

Sample and Setting: This study is a part of a research study[13] which proposed to develop a new health measurement for an organization to understand their staff's health burdens. A public tertiary hospital in eastern Thailand was the study site. It was chosen based on being a referral hospital with a large number of staff and their willingness to participate in the study. The study population included all staff under the nursing department such as registered nurses, nurse assistants and patient assistant in any hospital units. Those joining the hospital after 2014 were excluded.

Ethical Considerations: Ethics approval (IRB no. 082/57) was granted by the Institutional Review Board, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand. Informed consent was collected from each participant before data collection. Participants' rights were explained to them verbally and their privacy was protected throughout the study

Measures: The self-reported questionnaire consisted of two parts including a demographic part and the prevalence and incidence of diseases among nursing staff.

The *demographic part*: this contains questions on gender, age, marital status, job level and year of work.

The *prevalence and incidence of diseases occurring during 2014*: This part of questionnaire was developed based on the list of diseases of the Burden of Disease Thailand.[14] The questionnaire was tested for content validity using 5 experts including 2 burden of disease experts and 3 epidemiology experts. The pilot test was conducted with 30 nursing staff in a general hospital. The results showed that the questionnaire was too long list of diseases especially the list of acute diseases. As a result, we separated diseases in two groups;

*The chronic disease*s consist of 14 diseases such as diabetes mellitus, ischemic health disease, and hypertension. Other chronic diseases are identified in open-ended questions. In each disease, nursing staff were asked question, "Has a doctor ever told you that you have ... (disease)...?" The answers could be 1= "yes" or 0= "no" for each disease, with additional answers on the year of diagnosis for chronic diseases and the health status for some disease such as diabetes mellitus.

The acute disease component was further stratified into 7 groups of disease including digestive system, respiratory system, musculoskeletal system, excretory system, cardiovascular system, reproductive system, and other acute diseases being identified in open-end question. Nursing staff were asked question, "Has a doctor ever told you that you have ...(disease)... during 2014?". The answers could be 1= "yes" or 0= "no" for each disease, with additional answers on the frequency of having that acute disease during 2014 and the health status for some diseases such as diarrhea.

Data Collection: The project staff explain the purpose and processes of study before signing the consent form. Next, primary data was collected in July 2015 gathering individual's information about diseases that occurred during the 2014 calendar year by using self-reported questionnaire. It took approximately 10 minutes to complete the questionnaire. In addition, the data on disability weights were from the GBD study.[14, 15] Data on estimated duration of disease for each disease stage and severity was derived from the disease burden working group Thailand (Thai BOD study).[14] The number of cause-specific deaths in the study site was retrieved from the hospital's human resource department.

Data Analysis

The analysis was based on DALY calculation as used in the 1996 GBD study which is the measurement of the sum of the impact from premature death and from disability in one single unit.[9] However, we modified the calculation of DALY to estimate the burden of disease of nursing staff in this study to reflect organizational perspective. This was based on the employer's point of view, focusing on the impacts of the diseases that the employees have in their organization known as Disability-Adjusted Working Year (DAWY). DAWY captures the magnitude of the disease burden among working-aged staff by considering only Years Working with Disability (YWD) and Years of Work Lost (YWL).[13]

YWD is calculated by multiplying the incidence of each disease by disability weight and duration of disease (F1).[13] For diseases of long duration, we counted as the YWD until retirement age. The YWD uses an incidence-based approach which catches the future health consequences of new cases occurring in the study year. The formula for calculating YWD[13] is:

YWD = Incident * Disability weight * Duration of disease ..... (F1)

Disability weights indicate social preference or utility towards specific health or disease conditions. Disability weight is valued between 0 and 1, where 0 means perfect health and 1 means death.[9] In our study we used disability weights from the disease burden working group Thailand (Thai BOD study), relying on the person trade-off (PTO) elicitation method. Note that comorbidity was not considered in this study and disability weight was used independently for each disease.

To calculate the YWD in this study; first, we categorized all diseases and conditions using the International Classification of Diseases and Related Health Problem 10th Revision (ICD-10). Second, incident cases of chronic diseases were enumerated only from the people whose disease first occurred in 2014. For incidence of acute diseases, we calculated it from the survey data using the number of nursing staff's visits in 2014. Third, to calculate the weighted time spent in disability, incidence cases were multiplied by disease weight, reflecting the severity level of each disease, and the duration of disease. For chronic diseases with a duration of illness longer than one year, we estimated the YWD using the time until retirement age of 60 years. This is the public-sector retirement age in Thailand. Fourth, the YWD were calculated for three specific age groups, i.e., 15-29, 30-44 and 45-60 years. Moreover, the YWD results were presented by disease category and hospital service units. In this study we classified hospital service units in 6 inpatient wards and 13 other hospital service units including the emergency room, occupational health unit, and the health insurance center. Each staff generally worked at one specific ward or unit. Those with administrative roles working in more than one unit and in our analysis, were assigned to ward or unit they spent the most time in.

YWL was calculated considering the number of years one nursing staff member would have lived until retirement age if they had not died prematurely.[13] Our calculation of YWL required multiplying the number of cause-specific deaths using the duration between retirement age and average age at death (F2) as the remaining working years of a staff.[13] The YWL were presented by disease as shown below. Age weight or discounting was not applied in the calculation.

YWL = Cause-specific death * (Retirement age – Age at death) ….. (F2)

Results

Sample characteristics

Of 780 nursing staff, 98 were excluded from the study due to their short period of employment. Six hundred and seven questionnaires were returned making a response rate of 89%. Most participants were female, married and aged 30 to 44 years. Mean age was about 40 years. About two thirds of participants were registered nurses after that were patient assistant and nurse assistant, respectively. The average length of work was 15 years. Basic characteristics of the respondents are shown in **Table 1**.

Table 1 Sample Characteristics

General data	Questionnaire (N=607)	
	Number	%
Sex		
female	577	95.1
male	30	4.9
Age in years		
15-29	94	15.5
30-44	298	49.1
45-60.	215	35.4
Mean 40.7 yrs. Max. 60 Min. 21 SD = 9.5		
Marital status		
single	174	28.7
married	340	56.0
other	93	15.3
Job level		
registered nurse	418	68.9
nurse assistant	13	2.1
patient assistant	176	29.0
Average years of work (yrs.)	Mean 14.8 yrs. Max. 40 min. 1 SD=10.3	

Illnesses and deaths in the study year

Illnesses

Of diseases occurring among nursing staff in 2014, back pain, upper respiratory infection and dental caries were among the top three illness conditions as shown in **Table 2**. Regarding the prevalence of a comorbidity, 33.4% of nurses had a comorbidity while 43.2% of nurses had none.

Deaths & Years of Work Lost (YWL)

As shown in **Table 2**, two deaths were caused from ovarian cancer at age 38 years and intrahepatic bile duct carcinoma at age 57 years. The premature mortality at work or YWL among nursing staff totaled 25 years in 2014. Ovarian cancer had the greatest impact on YWL, accounting for 22.0 years or 88% while intrahepatic bile duct carcinoma accounted for 3.0 years or 12.0%.

Years Working with Disability (YWD)

By disease

The YWD in 2014 totaled 23.3 years. The top ten leading causes of YWD are shown in **Table 2**. Anxiety, osteoarthritis and hypertensive heart disease were the leading causes of YWD in the nursing department in 2014, accounting for 30.3%, 28.8% and 15.8%, respectively. When we considered the causes by classification of disease, mental disorders and musculoskeletal diseases were the leading causes of YWD for nursing staff, accounting for 33.9% and 32.6%, respectively.

Table 2 Top 10 diseases among nursing staff in 2014 by disease prevalence versus by Disability Adjusted Working Year

Prevalence	Disease	Prev. Rank
153	Back pain	1
108	Upper respiratory infection	2
54	Dental caries	3
31	Hypertensive heart disease	4
31	Peptic ulcer	5
30	Diarrheal diseases	6
25	Diabetes mellitus	7
17	Osteo-arthritis	8
13	Periodontal disease	9
11	Asthma	10

DAWY Rank	Disease	YWD	YWL	DAWY
1	Ovarian cancer	-	22.0	22.1
2	Anxiety disorders	7.1	-	7.1
3	Osteo-arthritis	6.7	-	6.7
4	Hypertensive heart disease	3.7	-	3.7
5	Intrahepatic bile duct carcinoma	-	3.0	3.0
6	Diabetes mellitus	2.1	-	2.1
7	Tuberculosis	1.2	-	1.2
8	Back pain	0.9	-	0.9
9	Depression	0.8	-	0.8
10	Dental caries	0.2	-	0.2

By ward

In consideration of YWD per person by ward, wards H, C, and F were the top three leading causes of YWD, accounting for 0.11, 0.08, and 0.06, respectively (see **Figure 1**). Anxiety disorders exhibited the highest health impact on most service units especially those with high workloads such as wards H, E, A, B and D. Osteoarthritis was the first and second leading cause of YWD in wards C, E, and D. Hypertensive heart disease was the first and second leading cause of YWD in wards C, F and B.

By age group

Figure 2 shows the YWD per person by age group. The YWD was highest in age group 15 to 29, accounting for 0.0055, followed by age group 45 to 60 and 30 to 44, accounting for 0.0029 and 0.0018, respectively. Anxiety was the highest leading cause in age group 15 to 29. The top three leading causes of YWD for other age groups were the same, i.e., anxiety disorders, osteo-arthritis and hypertensive heart disease.

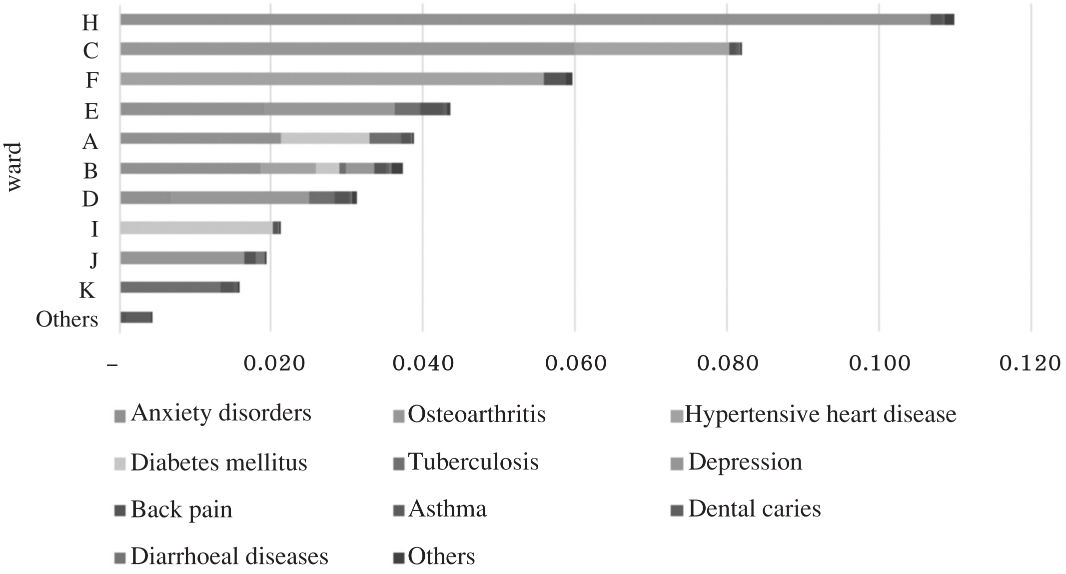

Figure 1 Top 10 leading causes of Years Working with Disability (YWD) by disease and ward

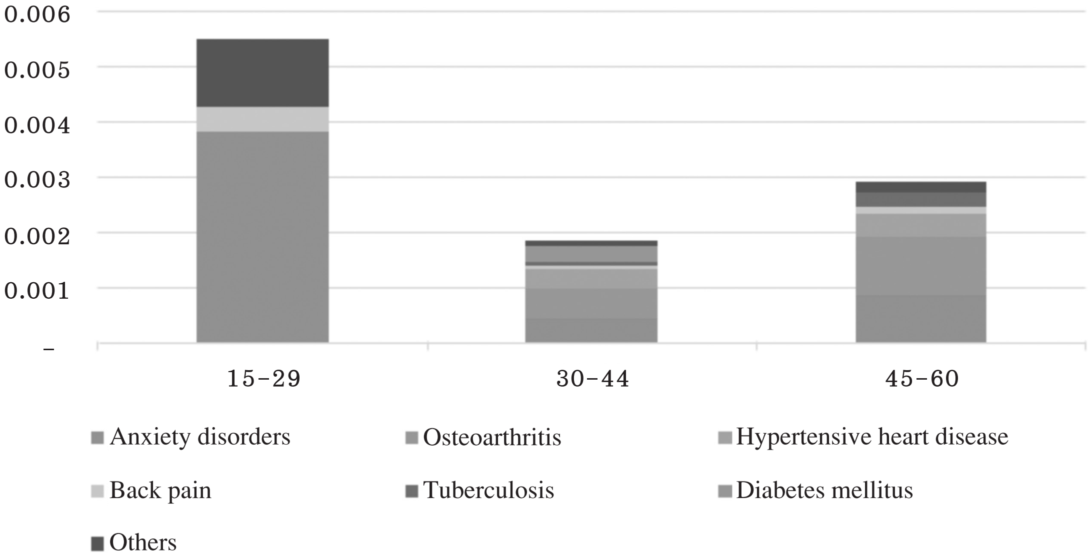

Figure 2 The leading causes of Years Working with Disability (YWD) by disease and age group

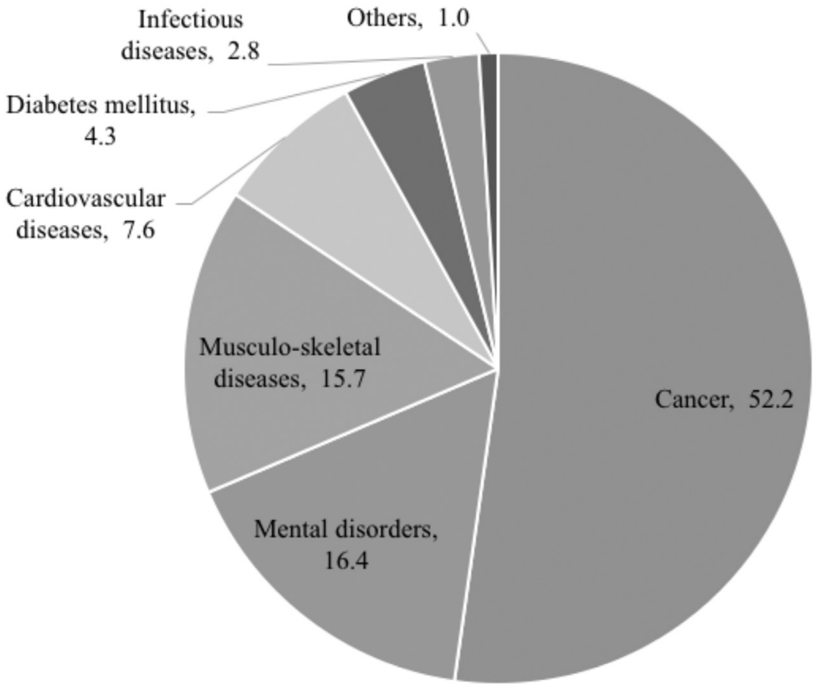

Figure 3 Proportion of total Disability Adjusted Working Years (DAWYs) for all staff by disease

The burden of diseases by disease and by disease group

The total disease burden of nursing staff including register nurse, nurse assistant and patient assistant from organizational perspective in 2014 totaled 48.3 DAWYs as shown in Table 2. The YWD or nonfatal outcome of diseases accounted for 48.2% of total DAWYs. The top three leading causes of the disease burden were ovarian cancer, 45.8%, anxiety disorders, 14.6% and osteo-arthritis, 13.9%.

Considering the DAWYs by disease group as shown in Figure 3, the top three leading causes were cancer, mental health and musculoskeletal diseases, accounting for 52.2%, 16.4% and 15.7%, respectively. Only cancer was affected by mortality by changing from the sixth YWD disease group to the first leading cause of DAWY (YWL=25.0 yrs., YWD=0.2 yrs.).

Discussion

Disease burden of nursing staff in a public sector tertiary hospital in southeast Thailand in 2014, when calculated as DAWY, totaled 48.3 years. This was on average, around one month of health lost per person. The majority of the burden came from noncommunicable diseases (NCDs) and nonfatal diseases. Cancer was the only fatal disease which incurred the largest DAWYs, almost all from early deaths. Mental disorders were the leading cause of the disease burden for nonfatal diseases. They occurred mostly in age group 15 to 29 years especially among those working in inpatient wards.

The results of this study indicated that traditional approaches of measuring the disease burden only by looking at the prevalence of illnesses or the number of deaths fragmentally may underestimate the health impacts of many key diseases that contribute to health and productivity lost. As a result, wrong priorities are used to set the health prevention and intervention strategies for hospital nursing staff. The differences can be easily seen in the change in ranking between the rank based on disease prevalence and the rank based on DAWYs (Table 2). Mental health and chronic diseases such as anxiety disorders, osteoarthritis, hypertensive heart disease, diabetes mellitus and tuberculosis moved up to the top fifth rank of YWD while the ranks of common diseases such as back pain, upper respiratory infection and dental caries declined. This was because the calculation of DAWY, particularly YWD, considers the pattern of each disease, which differ in severity and duration. Other diseases that have high impact on DAWY are those that resulted in deaths as in the case of ovarian cancer and intrahepatic bile duct carcinoma.

One interesting finding from this study was the significant contribution of anxiety in overall disease burden especially among younger staff. Patient care, decision making, high responsibility and organizational/structural change are common causes of anxiety among nurses. Younger nursing staff generally face higher workloads and stress from their daily roles in the workplace. They are assigned to high intensity wards and may not receive adequate supervision and support.[16] They are also hired as temporary staff before they receive a permanent position due to the restriction on civil service positions in the Ministry of Public Health. Stress is experienced from a major life transition from previously being a student with limited responsibility and family expectation.

Job stress and burnout is shown to be significantly associated with high turnover[17] and in Thailand, nurses employed between 1 to 5 years had the highest turnover rate.[18] Another study found that about 38.6% of nurses, aged 25 to 29 years, intended to leave and change to a job unrelated to nursing.[8] There could be several contributing factors including the lack of adequate training and orientation and proper deployment and support systems within the organization. Relationships between nursing staff and their supervisors including medical doctors[19] could be considered a contributing factor. Our results suggest that hospital management should provide adequate investment in good human resource management systems with particular attention to new or younger nursing staff that may include an effective orientation to the organization, clear job delegation, improvement in working conditions and support systems and other supportive measures.

In the non-fatal disease group, musculoskeletal diseases were the leading cause of physical illness after mental disorders. This was consistent with earlier studies concerning health problems among nurses in Thailand and other countries where musculoskeletal diseases were the most common health problems.[7, 20] Osteoarthritis could be due to occupational related factors such as inappropriate or intensive work style and repetitive tasks.[21] The strenuous works or job required physical effort constituted the third highest risks of musculoskeletal disorders (Odds ratio = 1.6; 95% CI: 1.5 to 1.8).[22] Besides, a meta-analysis study among hospital nurses and nursing aides showed that musculoskeletal disorders associated with psychosocial risk factors such as high psychosocial demands-low job control, effort reward imbalance, and low social support[23] Better occupational health support and training may be warranted. From recent systematic reviews about interventions to prevent and decrease musculoskeletal disorders among nurses between 2004 to 2016, it was found that most studies were of limited quality and they focused on patient lift systems and multi-component interventions include ergonomic program, patient handling, patient lifting, stress management and stretching exercise .[6, 20] High quality studies showed that unstable shoes,[24] stretch exercise,[25] and combining manual handling and ergonomics training[26] reduced pain and disability among nurses. Moreover, a study in the United States found that the knowledge of nurse educators and students could improve significantly with the inclusion of safe patient handling and movement in the nursing school curriculum.[27]

The burden from other non-communicable diseases such as hypertension and diabetes mellitus are similar to what we see in the general public and are more likely the result of lifestyle and consumption behaviors. Job stress and burn out could be a contributing factor to this.

Our findings regarding the nursing staff are not totally different from the disease burden among the general female population of working ages as presented by the disease burden working group Thailand (ThaiBOD study); Depression, diabetes mellitus, and osteoarthritis were among the top three diseases in the age group 30 to 59 years for Thai females.[28] These three diseases were also among the top ten disease burden in our study.

One major difference is that the Thai BOD study showed that anxiety was not in the top-ten disease burden rank for 30 to 59 years old Thai females and it was in the fifth rank for those females 15 to 29 years old.[28] Our study, however, has anxiety in the second rank. This may be because hospital nurses have to cope with several major workplace stressors including workload, difficult relationship with other clinical staff, emotional needs of patients and their families, and shift working.[16]

The burden from road accidents among the nurses was much lower than those shown in the national statistics. This is likely because they mostly live in the hospital compound where a dormitory is provided. Because most of nursing staff are woman and they have night shift work. Hospitals generally provide accommodation in the hospital areas to support shift work. In our study hospital, about 59 percent of the unmarried nurses stay in the residences provided within the hospital area. Furthermore, the study hospital has the reducing road accident policy. If nurses violent traffic law, it effects to their credit to promotion.

Even though mental illnesses were the second ranked in terms of DAWYs, it may still be underestimated for two reasons. First, because of stigmatization, it may be underreported in our self-reported questionnaires.[29] In another study that used self-reported surveys of mental health, about 36% of respondents underreported their conditions compared with medical records.[30] Second, they may be the root causes of other illnesses that were not properly investigated or diagnosed.[29]

In this study, dental caries ranked the third in term of disease prevalence. However, it was low (about 8.9%) comparing with Thai working age population 35-44 years (approximately 35%).[31]

In this study, we did not use age weight as in the GBD study because we used the organizational perspective among only working-age staff. However, age weight is a social preference, which values the young and older ages less than working ages.[9] Age weights slightly differ at working-age, so we assumed that the year of health life of nursing staff is equal. in addition, age weight did not affect the disease rankings by broad cause group.[9] Moreover, DAWYs differed from DALYs in the GBD study in that no discounting was used because a number of people have argued that discounting should not be applied to future health gains or losses.[32] Furthermore, when comparing the DALYs with and without age-weight and discounting in a related study, the main change only in rank order were mental illnesses revealing a minimal difference.[9] According to the impact of changing discounting in the GBD study, the DALYs were affected by discounting significantly, but it affected the older and younger age groups.[9] Moreover, the life cycle assessment (LCA) was applied to DALYs to present the disease burden in the workplace. They thought that the timing of release, exposure or health effect is the same so the years of life lived in the past, present or future do not differ[12].

Limitation

The major limitation of this study was from the use of a self-reported questionnaire, for this could could cause underreporting because of recall bias of participants, especially regarding the number of visits concerning acute disease and year of diagnosis in regards to chronic diseases. Moreover, the results may not be generalizable to the broader system, since the study participants were from one hospital only. Another problem was the misreporting of disease severity due to the lack of information or ignorance. It may have led to miscalculation of the disease burden from the use of incorrect disability weights. However, we expected the problem to be minimal given our study population comprised nurses possessing technical knowledge about illnesses and medical care.

In this study, we did not calculate the disease burden from comorbidity, i.e., when two or more disease conditions appeared together, occurring together with a primary disease.[33] This may have resulted in a conservative estimation of overall disease burden. However, our intention was to avoid double counting the burden when we calculated all combined comorbidities. Additionally, the target population of our study comprised working age staff having fewer comorbidities compared with the general population or the elderly, so any existing bias should be minimal.

Conclusions and Implications for Nursing Practice

This study showed that the leading causes of the disease burden among nursing staff were cancer, mental related disorders and musculoskeletal diseases. The majority of the burden came from non-communicable diseases. Mental disorders such as anxiety occurred among young staff and staff working in the inpatient ward.

Our findings have several policy implications for nursing practice. First, the method to calculate disease burden using an organizational perspective could be a model for other hospitals or organizations to follow as it can help prioritize diseases and identify areas for further investment in health prevention and promotion interventions.

Second, hospital management and nurse managers should pay more attention to good management practice specially to provide adequate support to new or younger nursing staff to reduce stress and burnout. This may include development of a team support mechanism and building positive relationship between nurse staff and their supervisors. Improving work conditions, suitable working hours, appropriate remuneration, and effort reward balance are additional areas of nursing workforce management to be considered.[19] The Thailand Nursing and Midwifery Council's upcoming residency training program for recent graduates could be another opportunity to strengthen staff competency and support to reduce their work-related anxiety.

Third, interventions to prevent musculoskeletal disorders are necessary for nursing staff. Hospital management should invest not only on physical interventions such as stretching exercise[25] and patient handling[26] but also on psychosocial interventions.[23] Some of multi-component interventions such as ergonomic training and safety handling of patients could be considered and prepared among the nursing staff since they are in nursing schools.[27]

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References

1. Sawaengdee K, Tangcharoensathien V, Theerawit T, Thungjaroenkul P, Thinkhamrop W, Prathumkam P, et al. Thai nurse cohort study: cohort profiles and key findings. BMC Nurs. 2016 15:10.
2. U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis. National and regional supply and demand projections of the nursing workforce: 2014-2030. Rockville: Maryland: 2017.
3. International Council of Nurses. Nursing input strengthens WHO global strategy for health human resources. International Nursing Review. 2016 63(2):153-160.
4. Toh SG, Ang E, Devi MK. Systematic review on the relationship between the nursing shortage and job satisfaction, stress and burnout levels among nurses in oncology/haematology settings. Int J Evid Based Healthc. 2012 10(2):126-141.
5. Ongete G, Duffy FJR. The impact of occupational splash, sharps and needlestick injuries (SSNIs) on the quality of life of healthcare workers in a Kenyan university hospital. Work. 2018 59(1):103-119.
6. Van Hoof W, O'Sullivan K, O'Keeffe M, Verschueren S, O'Sullivan P, Dankaerts W. The efficacy of interventions for low back pain in nurses: A systematic review. Int J Nurs Stud. 2018 77:222-231.
7. Thungjaroenkul P, Swaengdee K, Theerawit T, Tungcharoensathien V. Health Problems and Health Care Behaviors Among Registered Nurses in Thailnd. Journal of Health Systems Research. 2016 9(1):49-60. (in Thai)
8. Sawaengdee K. Supply of Registered Nurses in Thailand. Nonthaburi: Ministry of Public Health, Bureau of Nursing Department of Medical Services; 2009. (in Thai)
9. Murray CJL, Lopez AD, World Health Organization, World Bank and Harvard School of Public health. The global burden of disease: A comprehensive assessment of mortality and disability from diseases, injuries, and risk factors in 1990 and projected to 2020. Geneva: World Health Organization; 1996.
10. Bank TW. World development report 1993 investing in health. New York: 1993.
11. Friedman C, McKenna MT, Ahmed F, Krebs JG, Michaud C, Popova Y, et al. Assessing the burden of disease among an employed population: implications for employer-sponsored prevention programs. J Occup Environ Med. 2004 46(1): 3-9.
12. Scanlon KA, Gray GM, Francis RA, Lloyd SM, LaPuma P. The work environment disability-adjusted life year for use with life cycle assessment: a methodological approach. Environ Health. 2013 12:21.
13. Lertpitakpong C. Applying quality of life concept to employee health assessment in the organization [Doctoral thesis]. Bangkok: Chulalongkorn University; 2016. (in Thai)
14. Burden of Disease Thailand. Summary Measures of Population Health workshop. 1st ed. Nonthaburi: International Health Policy Program; 2014. 171 p. (in Thai)
15. World Health Organization. Glabal burden of disease 2004 update: disability weights for disease and conditions. Geneva: WHO. 2004 [cited 2017 Sep 22]. Available from: http://www.who.int/healthinfo/global_burden_disease/GBD2004_DisabilityWeights.pdf.
16. Nayomi WVPM. Workplace stress in nursing: a literature review. Journal of Social Statistics 2016 03(01):47-53.
17. Mosadeghrad AM. Occupational stress and turnover intention: implications for nursing management. Int J Health Policy Manag. 2013 1(2):169-176.
18. Jaiboon P, Chiangnangarm P, Kuhirnyarah P. The Proportion and causes of resigntaion of nurses from Srinagarind Hospital, Khon Kaen University. Srinagarind Med J. 2011 16(3): 233-238.
19. Sarafis P, Rousaki E, Tsounis A, Malliarou M, Lahana L, Bamidis P, et al. The impact of occupational stress on nurses' caring behaviors and their health related quality of life. BMC Nurs. 2016 15:56.
20. Richardson A, McNoe B, Derrett S, Harcombe H. Interventions to prevent and reduce the impact of musculoskeletal injuries among nurses: A systematic review. Int J Nurs Stud. 2018 82:58-67.
21. Yucesoy B, Charles LE, Baker B, Burchfiel CM. Occupational and genetic risk factors for osteoarthritis: a review. Work. 2015 50(2):261-273.
22. Thinkhamrop W, Laohasiriwong W. Factors Associated with musculoskeletal disorders among registered nurses: evidence from the Thai nurse cohort study. Kathmandu Univ Med J (KUMJ). 2015 13(51):238-243.

23. Bernal D, Campos-Serna J, Tobias A, Vargas-Prada S, Benavides FG, Serra C. Work-related psychosocial risk factors and musculoskeletal disorders in hospital nurses and nursing aides: a systematic review and meta-analysis. Int J Nurs Stud. 2015 52(2):635-648.
24. Vieira ER, Brunt D. Does wearing unstable shoes reduce low back pain and disability in nurses? A randomized controlled pilot study. Clin Rehabil. 2016 30(2):167-173.
25. Chen HM, Wang HH, Chen CH, Hu HM. Effectiveness of a stretching exercise program on low back pain and exercise self-efficacy among nurses in Taiwan: a randomized clinical trial. Pain Manag Nurs. 2014 15(1):283-291.
26. Jaromi M, Nemeth A, Kranicz J, Laczko T, Betlehem J. Treatment and ergonomics training of work-related lower back pain and body posture problems for nurses. J Clin Nurs. 2012 21(11-12):1776-1784.
27. Nelson AL, Waters TR, Menzel NN, Hughes N, Hagan PC, Powell-Cope G, et al. Effectiveness of an evidence-based curriculum module in nursing schools targeting safe patient handling and movement. Int J Nurs Educ Scholarsh. 2007 4:Article26.
28. Burden of Disease Thailand. Disability-Adjusted Life Year : DALY. The graphico systema co., ltd: International Health Policy Program, 2013.
29. Vigo D, Thornicroft G, Atun R. Estimating the true global burden of mental illness. Lancet Psychiatry. 2016 3(2):171-178.
30. Bharadwaj P, Pai MM, Suziedelyte A. Mental health stigma. Economics Letters. 2017 159(Issue C):57-60.
31. Department of Health. 8th National Oral Health Surveillance. Nonthaburi: Ministry of public health. 2017 [cited 2018 May 7]; Available from: https://www.anamai.moph.go.th/ewt_news.php?nid=10623.
32. World Health Organization. WHO methods and data sources for global burden of disease estimates 2000-2011. Geneva: World Health Organization, 2013.
33. Cohen A. Addressing comorbidity between mental disorders and major noncommunicable diseases Denmark: World Health Organization, 2017.

ภาระโรคของกลุ่มการพยาบาลในโรงพยาบาลระดับตติยภูมิแห่งหนึ่งในประเทศไทย

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บทคัดย่อ: กลุ่มการพยาบาลถือเป็นกำลังคนหลักในระบบบริการสุขภาพ ซึ่งต้องเผชิญกับปัญหาการลาออกและการกระจายมีความเหลื่อมล้ำในแต่ละพื้นที่ ทำให้ต้องทำงานหนักและต้องเผชิญกับปัญหาสุขภาพและความเหนื่อยล้า การศึกษาแบบตัดขวางครั้งนี้จึงทำการวัดผลกระทบของการเจ็บป่วยในกลุ่มการพยาบาลของโรงพยาบาลในระดับตติยภูมิแห่งหนึ่งในประเทศไทย เดือนกรกฎาคม พ.ศ. 2558 กลุ่มการพยาบาลจำนวน 780 คน ในฝ่ายการพยาบาลซึ่งประกอบด้วย พยาบาลวิชาชีพ ผู้ช่วยพยาบาล และผู้ช่วยเหลือผู้ป่วย ตอบแบบสอบถามแบบตอบด้วยตนเองซึ่งประกอบ 2 ส่วน ได้แก่ ข้อมูลด้านประชากร ความชุกและอุบัติการณ์ของโรคต่างๆ ที่เกิดขึ้นในระหว่างปี พ.ศ. 2557 ข้อมูลการตายรวบรวมจากฝ่ายทรัพยากรบุคคล ค่าถ่วงน้ำหนักความพิการและระยะเวลาของโรคได้จากการศึกษาภาระโรคของประเทศไทยและแหล่งข้อมูลต่างประเทศ ภาระโรคทั้งหมดประมาณค่าโดยใช้การการสูญเสียปีสุขภาวะในช่วงทำงานในมุมมองขององค์กร ที่พัฒนาจากแนวคิดการสูญเสียปีสุขภาวะ

ผลการศึกษา พบว่า ภาระโรคทั้งหมดของกลุ่มการพยาบาล ณ โรงพยาบาลแห่งนี้ ปี พ.ศ.2557 มีค่า 48.3 ปี ปีที่อยู่ด้วยการเจ็บป่วยในขณะทำงานคิดเป็นร้อยละ 48.2 ของภาระโรคทั้งหมด โรค 3 ลำดับแรกที่ทำให้เกิดภาระโรคมากที่สุด ได้แก่ โรคมะเร็งรังไข่ร้อยละ 45.8 โรควิตกกังวลร้อยละ 14.6 และโรคข้อเสื่อมร้อยละ 13.9 โรควิตกกังวลเป็นโรคที่ทำให้เกิดการสูญเสียมากที่สุดในกลุ่มโรคที่ไม่ทำให้เกิดการตาย ส่วนใหญ่เกิดขึ้นในกลุ่มพยาบาลที่อายุน้อยและอยู่ในหอผู้ป่วยใน มะเร็งเป็นโรคที่ทำให้เสียชีวิตเพียงโรคเดียวโดยก่อให้เกิดความสูญเสียมากที่สุดคิดเป็นร้อยละ 51.8 ของภาระโรคทั้งหมด ผลการศึกษาชี้ให้เห็นว่าควรให้ความสำคัญกับภาวะด้านจิตใจที่เกิดขึ้นกับพยาบาลอายุน้อยในหอผู้ป่วยในและโรคระบบกล้ามเนื้อและกระดูก โดยควรมีการดำเนินการลงทุนในการพัฒนาสภาวะการทำงานและการให้การสนับสนุนสำหรับกลุ่มการพยาบาล นอกจากนั้นควรพิจารณาเพิ่มการเรียนรู้ด้านการยศาสตร์และการเคลื่อนย้ายผู้ป่วยอย่างถูกวิธีโดยอาจบรรจุในหลักสูตรการฝึกอบรมทั้งในกลุ่มนักเรียนพยาบาลรวมทั้งหลักสูตรทบทวนความรู้สำหรับพยาบาลที่ทำงานแล้ว

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Editorial

Effects of Transcendental Meditation on Blood Pressure in Adults: A Review

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Hypertension is the leading global health risk [1]. In 2016, there were 56.9 million deaths globally; 71% were due to non-communicable diseases. Of these, 44% were cardiovascular diseases of which hypertension is the leading risk factor [2,3]. Data from 154 countries between 1990 and 2015 showed that the rate of systolic blood pressure (SBP) of 140 mmHg or higher increased from 17,307 to 20,526 per 100,000. Also increasing during that same time period was the estimated annual death rate from ischemic heart disease, hemorrhagic stroke and ischemic stroke, from 97.9 deaths in 1990 to 106.3 deaths per 100,000 population in 2015 [1]. To make matters more complex. hypertension disproportionately affects people from low- to middle-income countries[4]. In fact, in 2010, 31.5% of the world's adults had hypertension; 28.5% in high-income countries and 31.5% in low- and middle-income countries[5].

Given these large numbers, a variety of therapies are needed for both prevention and control. While medication is one therapy, nonpharmaceutical interventions that can prevent as well as compliment pharmaceutical therapies can be cost-effective and easily available.

Meditation is one nonpharmaceutical therapy with increasing popularity. Currently there is a growing body of research investigating the effects of various types of meditation on blood pressure (BP). Within that body of research, one meditation method that has been widely used[6] is Transcendental Meditation (TM). The purpose of this editorial is to review the published studies conducted to examine the effects of TM on BP in adults.

Transcendental Meditation Described. Transcendental Meditation (TM) is a mind-body intervention, which was introduced by Maharishi Mahesh Yogi in 1959[7]. It is a systematic, psychophysiological procedure based in the ancient Vedic tradition of India. The main intervention is described as being simple, natural, and effortless. TM instructors who are certified by the Maharishi Foundation provide seven-step standardized instructions including an introductory and preparatory lecture, a personal interview and personal instruction, and consecutive follow-up sessions over three consecutive days. After the seven-step course, participants are invited to attend individual meetings with the TM instructor to verify the mechanics of their practice and maintain regularity[6,8]. TM practitioners then practice on their own for 20 minutes twice a day with eyes closed as a daily routine[9,10].

Inclusion/Exclusion Criteria. For this review, we included the primary studies (with any type of quantitative research design) evaluating TM interventions that were aimed to reduce BP in adults and were published in English. We excluded studies where the

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researchers did not report the actual BP values or used case study or case series designs. In addition, we excluded studies published in a language other than English which may have limited our search to Western studies only.

We searched 19 electronic databases for primaries studies (See Table) without date limitation, i.e., from inception of each database to 2019. Key terms included "pulmonary wedge pressure" OR "blood pressure" OR "arterial pressure" OR "venous pressure" OR hypertension OR hypertensive OR "portal pressure" AND meditate* OR mindfulness OR mindful* OR meditation. Subject headings were exploded to get 8,048 articles. After 1,711 duplicates were removed, 6,337 studies remained. During the review of the title, an additional 6,293 studies were excluded because they did not include TM and blood pressure. Of the remaining 44 studies, 26 were excluded for the following reasons: not English (*s*=1), systematic review and meta-analysis (*s*=17), letter/opinion (*s*=5), and studies did not provide the actual blood pressure values (*s*=3). Finally, a total of 18 studies met inclusion criteria and were included in this review; that is, 13 from the U.S., 2 from India, and 1 each from Ireland, Germany, and New Zealand.

TM with Normotensive Participants. Researchers used TM with various samples including both healthy participants as well as participants with health conditions. Among presumably normotensive samples, female medical student meditators (*n*=6) had significantly greater decreases in SBP and DBP than did a control group of non-meditators (*n*=6) who sat in a relaxed state with eyes closed [11]. Conversely, when comparing meditators over 4 days of TM (*n*=10) to non-meditators over 4 days of resting (*n*=10), researchers found no significant main or interaction effects between the two groups [12]. Similarly, when a TM group (*n*=22) was compared to a stress education group (*n*=17) who kept a diary, only the highly compliant meditators had a significantly decreased DBP [8]. There may have been no differences across the groups because the effect of stress education and the diary can be cathartic perhaps making the two interventions equally effective.

BPs of Experienced Meditators. Some research teams examined BPs of experienced meditators before and after TM. Parulkar and colleagues[13] compared the BP of 12 meditators pre- and post-meditation and found that only SBP decreased significantly. When comparing 20 meditators' BPs before and after TM to their BPs before and after sitting quietly, Waal-Manning and Jenkins[14] found no significant differences. One explanation for these non-significant changes may be that the experienced meditators already had low BPs allowing little change in their later BPs, that is, there may have been too small of an effect size to show significances given the small sample sizes. It may also be that TM simply was not effective.

BPs after Exercise for Long-Term Meditators. Lang and colleagues[15] examined the effects of long-term TM on BPs before and after 3 minutes of exercise. They compared a group of 10 meditators with 2.3 years of TM experience to a group of 10 meditators with 4.1 years of experience. Meditators with longer TM experience showed significantly higher BPs during and after 3 min of exercise when preceded by meditation than by reading. Participants with a shorter TM practice showed the reverse, significantly higher BPs during and after 3 min of exercise when preceded by reading than by meditation. Further, the researchers showed that TM effects on the autonomic nervous system was more obvious in meditators with longer practices. However, with only 10 males per group, these findings should be interpreted with caution.

TM for Those at Risk for Hypertension. Nidich and colleagues [6] compared a TM group of 93 college students with a waitlist group of 114 college students (*N*=207). They found no difference in BP between the two groups likely because the sample of young adults had baseline BPs that were too low to be amenable to change at all [6]. However, when analyzing a subgroup of students (n=112) who were at risk for hypertension, they showed significantly reduced SBP and DBP [6]. This highlights the focus of TM on individuals with hypertension as being those who might benefit most.

TM for People with Hypertension. Blood pressures of people with hypertension may be more amenable to meditation. Some researchers who studied people with borderline or definitive hypertension showed significant improvements in SBP and DBP after 6 months [16,17] regardless of small sample sizes of 16 to 22. Others showed drops in SBP over 6 months without significance when their sample size was 7 [18]. Still others showed significant reductions for the first 3 months that disappeared over months 4-6 in a sample of 20 [19]. In a sample of 150 hypertensive African Americans, SBP and DBP in the TM group dropped significantly over 12 months, but the SBP was not different from the health education group while the DBP was reduced significantly more compared to a health education group [9]. Likewise, researchers showed a significant improvement in SBP over 4 months in the TM group (n=52) compared to health education group (n=51) in patients with heart disease [10] or in DBP of African American patients with heart disease (n=54 in TM group; n=44 in health education group) over 5.4 years [7]. Finally in a sample of hypertensive patients, Seer & Raeburn [20] showed similar SBP and DBP reductions across two meditation groups over 3 months, TM with a mantra (n=14) and TM without (n=14; which some would not consider TM). Compared to the no-treatment controls (n=13), only diastolic reductions were significant.

Sample Sizes. As is obvious from above, most studies had relatively small sample sizes. Samples ranged from 7 to 207. Across the 18 studies, only four had samples greater than 52. One study had 52 participants; 13 had samples less than 52 and typically those were split into two or three groups resulting in quite small group sizes.

Designs. Most researchers used a one-group design [13-19,21]. Using a one group crossover design, Delmonte [22] randomized participants to conditions to control for order and expectations of meditation. Some researchers compared meditators with non-meditators[12,23]. Lang and colleagues [15] compared advanced meditators (mean TM practice 4.1 years) to long-term meditators (mean TM practice 2.3 years). Finally, several researchers conducted randomized trials [6,7,9-11,20].

Follow-up Time. Many researchers examined the more immediate effects of TM through designs that included only one or two visits [13-15,21-23]. Others measured follow-up BP within 6 months [16-19] or less [6,8,10,11,20], 12 months [9], or as long as 5.4 years [7].

Comparison Groups. To best test the effects of TM, participants should be randomized to TM or control groups [22]. One might expect that the best control groups would be non-meditators sitting is a relaxed state, possibly with the eyes closed[11,12,22] or a waitlist group [6]. In one study, two groups of TM meditation were compared with similar effects, one group using a mantra and one without a mantra [20]. Another suitable control group might be a health education group that might provide an attention control group [7,9,10]. However, a stress education group that includes keeping a diary might potentially have very calming effects making it impossible to separate the effects of TM from the comparison group [8]. Other comparison groups that may have effects on participants include a Shavasana group where participants laid in deep relaxation with a blank mind [11] and a progressive relaxation group which involves systematically alternating tensing and relaxing of various muscle groups [9].

Summary of Findings and Implications for Research. Overall, TM looks promising as an alternative therapy to reduce BP in particular for people with borderline or definitive hypertension. While findings are inconclusive at this point, future researchers might consider randomized controlled trials over several months with a considerable sample size. In the most immediate future, we plan to examine the TM effects quantitatively through a meta-analysis. This will allow us to determine the effect size across all studies, with or without large sample sizes. It will also allow examination of moderator effects.

Implications for Practice. Nurses might face several challenges when incorporating TM into treatment regimens for patients with hypertension. One challenge is that to learn TM, patients need training and this has a cost. While these trainings could be scheduled regularly, the bigger challenge will be who would pay for the training. Another challenge might be the lack of support of the medical provider because TM is generally not part of the Western medical model. While TM might be more supported and encouraged by Asian physicians, patients need to consistently feel that support and encouragement across all of their health care providers. Finally, another challenge might be that patients themselves may not believe in TM's effect on BP. While this can be remedied with education, many patients will not be motivated enough to practice TM for 20 minutes twice/day.

In the meantime, nurses might suggest meditation for patients who want to avoid antihypertensive medication, particularly in the early stages when BPs indicate borderline hypertension. While we focused this review on TM, presumably other types of meditation might be effective as well. Nurses might encourage patients to sit quietly with eyes closed, starting with 5 minutes and increasing to 20 minutes over time, during which they repeat a mantra in their head. Some patients might like to focus on their breathing instead. At this point, there is enough evidence to suggest that meditation may be beneficial and should be encouraged as a supplement to other hypertensive therapies. Considering meditation from a risk/benefit perspective, there is no risk but can have a potential benefit. In other words, what can it hurt?

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Table. Databases Searched and Years Included

Journal Literature	Years
Education Resources Information Center (ERIC)	1966+
CINAHL	1937+
Scopus	1788+
Ovid PsycINFO	1967+
Ovid Medline	1946+
Cochrane Library	1995+
Grey Literature	
Bielefeld Academic Search Engine (BASE)	2004+
ProQuest Dissertation & Theses	1996+
ClinicalTrials.gov	2000+
Electronic Journal Hand Search	
American Journal of Hypertension	1988+
The American Journal of Cardiology	1958+
European Society of Hypertension	1983+
Journal of American Society of Hypertension	2007+
International Journal of Hypertension	2009+
Journal of Human Hypertension	1987+
Journal of the American Heart Association	2012+
Journal Mindfulness-Springer link of the American Heart Association	2010+
Website	
ScienceDirect	1995+
American Psychological Association	1892+

References

1. Forouzanfar MH, Liu P, Roth GA, et al. Global Burden of Hypertension and Systolic Blood Pressure of at Least 110 to 115 mm Hg, 1990-2015. JAMA 2017;317: 165-82.
2. Egan BM, Kjeldsen SE, Grassi G, Esler M, Mancia G. The global burden of hypertension exceeds 1.4 billion people: should a systolic blood pressure target below 130 become the universal standard? J Hypertens 2019.
3. Global Health Observatory (GHO) data: NCD mortality and morbidity. at https://www.who.int/gho/ncd/mortality_morbidity/en/.)
4. World Health Organization. A global brief on Hypertension: Silent killer, global public health crisis. Geneva, Switzerland: WHO Press; 2013.
5. Mills KT, Bundy JD, Kelly TN, et al. Global Disparities of Hypertension Prevalence and Control: A Systematic Analysis of Population-Based Studies From 90 Countries. Circulation 2016;134:441-50.
6. Nidich SI, Rainforth MV, Haaga DA, et al. A randomized controlled trial on effects of the Transcendental Meditation program on blood pressure, psychological distress, and coping in young adults. American journal of hypertension 2009:1326-31.
7. Schneider RH, Grim CE, Rainforth MV, et al. Stress reduction in the secondary prevention of cardiovascular disease: Randomized, controlled trial of transcendental meditation and health education in blacks. Circulation: Cardiovascular Quality and Outcomes 2012;5:750-8.
8. Wenneberg SR, Schneider RH, Walton KG, et al. A controlled study of the effects of the Transcendental Meditation program on cardiovascular reactivity and ambulatory blood pressure. International Journal of Neuroscience 1997;89:15-28.
9. Schneider RH, Alexander CN, Staggers F, et al. A randomized controlled trial of stress reduction in African Americans treated for hypertension for over one year. American journal of hypertension2005:88-98.
10. Paul-Labrador M, Polk D, Dwyer JH, et al. Effects of a randomized controlled trial of transcendental meditation on components of the metabolic syndrome in subjects with coronary heart disease. Archives of Internal Medicine 2006;166:1218-24.
11. Bagga OP, Gandhi A. A comparative study of the effect of Transcendental Meditation (T.M.) and Shavasana practice on cardiovascular system. Indian Heart Journal 1983;35:39-45.
12. Holmes DS, Solomon S, Cappo BM, Greenberg JL. Effect of Transcendental Meditation versus resting on physiological and subjective arousal. J Pers Soc Psychol 1983;44: 1245-52.
13. Parulkar VG, Prabhavalkar SL, Bhatt JV. Observations on some physiological effects of transcendental meditation (T.M.). Indian Journal of Medical Sciences 1974;28: 156-8.
14. Waal-Manning HJ, Jenkins DA. Systolic blood pressure and pulse rate during transcendental meditation. Proceedings of the University of Otago Medical School 1979;57: 75-6.
15. Lang R, Dehof K, Meurer KA, Kaufmann W. Sympathetic activity and transcendental meditation. Journal of Neural Transmission 1979;44:117-35.
16. Agarwal BL, Kharbanda A. Effect of transcendental meditation on mild and moderate hypertension. The Journal of the Association of Physicians of India 1981;29: 591-6.
17. Benson H, Rosner BA, Marzetta BR, Klemchuk HP. Decreased blood pressure in borderline hypertensive subjects who practiced meditation. Journal of Chronic Diseases 1974;27:163-9.
18. Blackwell B, Hanenson I, Bloomfield S. Transcendental meditation in hypertension. Individual response patterns. Lancet 1976;1:223-6.
19. Pollack A, Case D, Weber M, Laragh J. Limitations of transcendental meditation in the treatment of essential hypertension. The Lancet 1977;309:71-3.
20. Seer P, Raeburn JM. Meditation training and essential hypertension: A methodological study. Journal of Behavioral Medicine 1980;3:59-71.

21. Gash A, Karliner JS. No effect of transcendental meditation on left ventricular function. Annals of Internal Medicine 1978;88:215-6.
22. Delmonte MM. Physiological responses during meditation and rest. Biofeedback and self-regulation1984:181-200.
23. Barnes VA, Treiber FA, Turner JR, Davis H, Strong WB. Acute effects of transcendental meditation on hemodynamic functioning in middle-aged adults. Psychosomatic Medicine 1999;61:525-31.

Development and Evaluation of a Suicide Prevention Program for Secondary School Students

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Abstract: Adolescent suicide is a major public health concern in many countries, including Thailand, and the importance of suicide prevention programs at secondary school level has been recognized. This is the second paper of a large action research study focused on the development, implementation and evaluation of the Thai Suicide Prevention Program for Secondary School Students, undertaken in collaboration with stakeholders of adolescent peer leaders, students, parents, school teachers and administrators. This involved seven steps: 1) establishing mutual commitment and engaging a core working group; 2) conducting a situational analysis; 3) analyzing problems and needs; 4) designing; 5) implementing; 6) evaluating; and 7) critiquing feasibility. Qualitative data were collected from focus group discussions and in-depth interviews and analyzed using content analysis. Quantitative data was collected using suicide knowledge and attitude questionnaires and analyzed using descriptive statistics, and a t-test was used to compare scores pre- and post-training.

The Program outcomes indicated significant positive change in the scores of the three stakeholder groups in suicide knowledge and attitude compared with the baseline scores. Stakeholder reflections noted that adolescent peer leaders developed leadership skills and parents and teachers learnt how to identify at-risk children. The process described illustrates how nurses can work with communities to improve health and build knowledge regarding suicide and prevention programs for adolescents.

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Keywords: Action research, Adolescent suicide, Suicide prevention program, Secondary school students, Thailand

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Introduction

The World Health Organization estimated that 1.2 million adolescents aged between 10 to 19 years died in 2015 – over 3000 every day – mostly from preventable or treatable causes, and suicide accounted for 101,799 deaths.[1] A Thai study of 3,100 secondary students investigating the prevalence of

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mental health disorders found that the prevalence of suicidal ideation, suicidal plans and attempted suicide were 2.8, 0.8 and 0.4 respectively.[2] A recent central Thai study of 437 adolescents aged 12-19 years and attending secondary school reported that 20.6% reported suicidal ideation.[3] Of particular concern are the high rates in Chiang Mai, northern Thailand of suicide for all age groups, being the second highest in the country in 2014 and third highest in 2016.[4]

Adolescent suicide has serious impacts not only for the individual but for family and friends, especially the adolescent's peers[5], and results in a substantially increased risk of subsequent suicide attempts.[6] Completed suicide represents a high economic cost to the community.[7] School-based awareness programs have been shown to reduce suicide attempts[8] for example, a European multi-country, randomized control trial of universal, school-based interventions of short duration was found to be effective in preventing adolescent suicide and suicidal ideation.[9]

However, to date there have been no programs specifically targeting suicide prevention with secondary school students in Thailand, and little is known about what constitutes an effective program in the Thai context. This article describes the development, implementation, and evaluation of such a program in a Thai secondary school.

Literature review

Concerns about suicide globally and adolescent suicide in particular are well documented.[10,11,12] High suicide rates in Thailand have led to a number of initiatives to tackle the rising problem although programs specifically targeting suicide prevention with secondary school students in Thailand have not been implemented, and most school-based prevention strategies have been carried out in Western countries.[13,14] Although several research prevention studies overseas have claimed positive results, the methodological rigor of these studies has generally been weak and lacking a theoretical framework to guide implementation, to measure effectiveness, or show evidence of clinical significance.[15,16] These programs are not without their critics,[17] and poorly managed programs in schools are at risk of raising the possibility of suicide among vulnerable young people.[16]

Action research (AR), chosen for this study, was developed by Lewin who was interested in the study of human groups and bringing about change.[17] In the AR process the researcher enters a real-world situation, in this case the school, and aims both to improve it and to acquire knowledge following along a path that unfolds through working with participants on the chosen task.[17] This research was designed so that participants could become active collaborators in shaping the outcomes, a philosophy that is congruent with that of AR. The approach is particularly well suited to knowledge development and has been used in a number of studies where adolescents have been both participants and collaborators.[18,19,20]

Comprehensive suicide prevention programs for adolescents comprise several critical elements that include at primary health level: a) education and awareness, b) screening for a person who at high risk, c) medical treatments, d) psychotherapy, e) continuing care for suicide attempts, f) access to lethal means restriction and g) suicide guidelines for media reporting.[21] The key aspects for the implementation of comprehensive suicide prevention were recognized by the National Action Alliance's Transforming Communities and include "1) Unity—sharing a vision for broad-based support attainment, 2) Planning—a strategic planning process that lays out stakeholder roles and intended outcomes, 3) Integration—multiple integrated use suicide prevention strategies, 4) Fit—activities alignment with context, culture, and readiness, 5) Communication—clear, open, and consistent communication, 6) Data—surveillance use and evaluation data to guide action, assess progress, and make changes, and 7) Sustainability—a focus on long-lasting change".[22(p17)]

In Thailand, previous studies have focused on reducing depressive symptoms among Thai adolescents.[23, 24, 25] Although these programs did not include strategies for preventing suicidal risk behaviors among Thai secondary school students, they were primarily developed and delivered by researchers. A suicide prevention program requires close collaboration among professionals, parents, school teachers, adolescents, and peers because adolescent suicide risk behavior is complex and multidisciplinary input is required. This involves school and community levels in order to implement effective programs which include consideration of risk reduction and enhancement of protective factors related to adolescent suicidal behavior. Research has indicated that the most effective methods for gaining commitment and acceptance is active participation in problem solving. Thus an AR approach[26] was chosen to be the appropriate methodology for developing and guiding the implementation in this study because stakeholder participation is so fundamental to success. This study built on a previous study phase that explored the perceptions of adolescents, teachers, and parents towards causes and prevention of suicide in secondary school students[26], and which included the above mentioned elements recommended by the National Action Alliance.

Study aim

To develop a pilot program on suicide prevention for Thai secondary school students, and then implement and evaluate this in a northern Thailand school.

Method

Design

An AR design[27] was used to focus on empowering adolescent peer leaders to develop a collaborative program to prevent adolescent suicide. The full study comprised three phases: 1) situational analysis of a secondary school students suicide prevention, in-depth interviews with parents, and school teachers, and focus group discussions (FGDs) with secondary school students: 2) collaborating with adolescent Core Working Group (CWG) to develop and implement a suicide prevention program, including revising the plan until the program was appropriate for the school context: and 3) evaluating the program using Suicide Knowledge and Attitude Questions (SKAQ) and group discussion guide questions for evaluating the feasibility and appropriateness following the pilot program: phases 2 and 3 are addressed in this article.

Setting and participants

The research took place at an urban school in Chiang Mai Province, Thailand under the administration of the Ministry of Education. The school provides education from grades 7-12. Participants included 12 CWGs, 165 school students involved in program implementation, and 113 parents, and 60 school teachers who participated in the pilot program.

Ethical considerations

Study approval was granted by the Research Ethics Review Committee of the Faculty of Nursing, Chiang Mai University, Thailand (Approval number l #Full-007-2014) and permission obtained from school authorities. The principal researcher (PI) asked all participants >18 years to sign a consent form. For those <18 years, parents or guardians signed this form. Audio recordings were made with permission. Confidentiality was rigorously maintained throughout, for example, to ensure anonymity and confidentiality of participants' information, code numbers were given for names and questionnaires. Had students become distressed they would have been referred to the school counsellor but this was not required.

Data collection

The Thai Suicide Prevention Program for Secondary School Students (TSPPSSS) was developed, piloted, implemented and evaluated between June 2014 and July 2016. See Figure 1. The development and evaluation phases employed both quantitative and qualitative methods.

Situational analysis identified the key components to be included in the Program, and depended on information collected from focus group discussions (FGDs) with 40 secondary school students, in-depth interviews (IDIs) with four parents, and three school teachers as described in previous paper.[26] These key elements were then used to design the program in conjunction with the critical elements identified from the literature and the CWG was consulted about program content and contextual fit at every stage of program development.

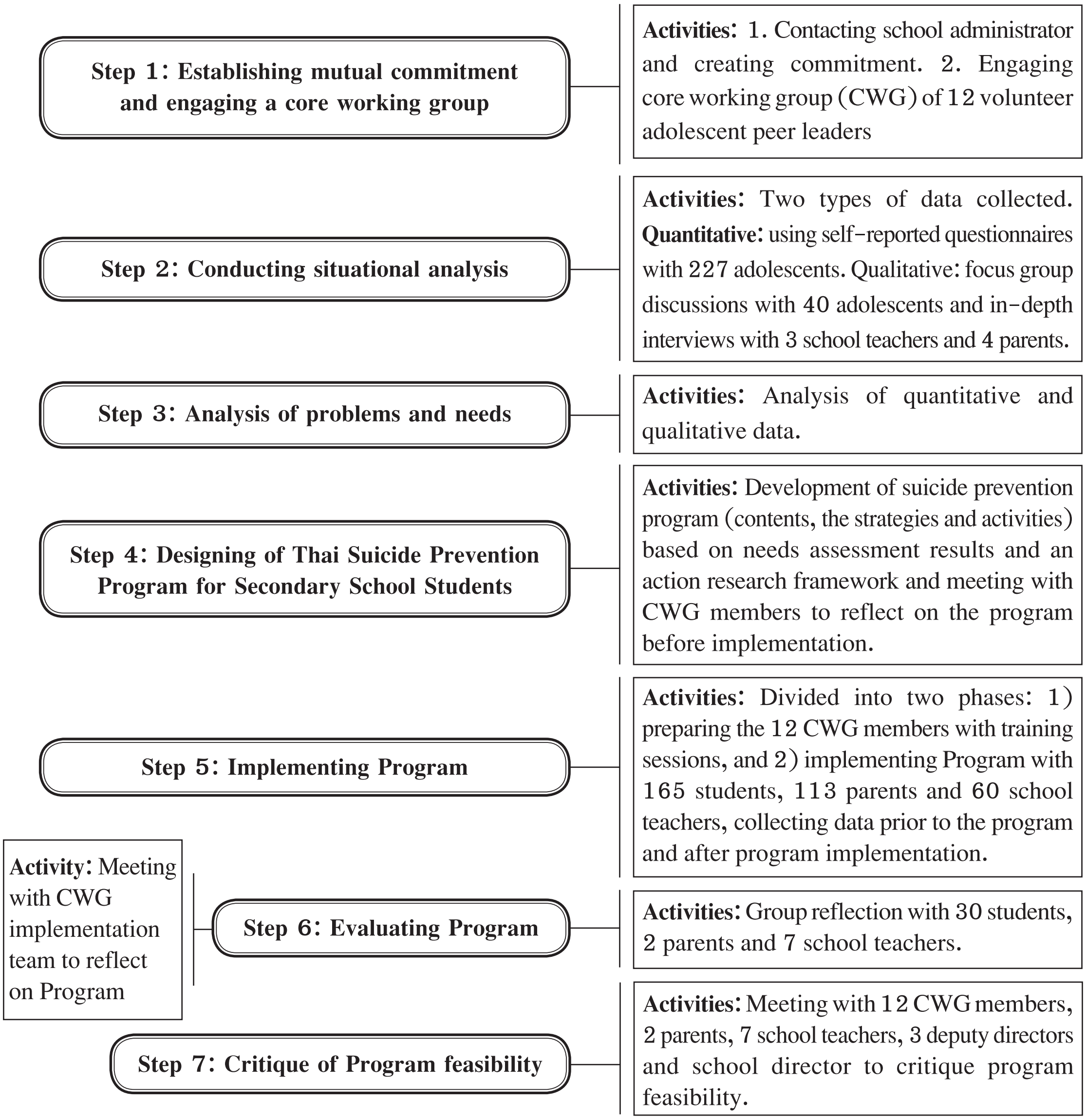
Implementation strategies were divided into two parts: 1) preparing the 12 adolescent CWG members by conducting a 6-hour, 1-day workshop comprising ten elements using a participatory approach. Activities included brainstorming and sharing experiences to assist participants to generate ideas in problem solving. Throughout the study the PI acted as a consultant, observer and facilitator to support the CWG implementation team.

Evaluation included the administration of instruments described below, and given to the 12 adolescent CWG members at baseline before starting the program activities and immediately after the program. 2) The adolescent CWG members conducted a campaign of suicide prevention in school with 165 target students in a month of this campaign. In addition a family nurse was invited to conduct 4 training sessions with 113 parents including topics such as understanding adolescent development; parenting styles; parent-teen communication; and managing parents' expectations. In addition, a mental health nurse conducted a seminar on the basics of counseling with 60 school teachers. The SKAQ was given to the 113 parents and 60 school teacher participants at baseline and immediately after the program. In this study measure a suicide knowledge and attitudes that congruent with the results of a systematic overview of adolescent suicide prevention program.[17]

Instruments

Evaluation methods included the Lifeline Pre-Test Questionnaire developed by Kalafat and Underwood in 1989.[28] With the authors' permission it was translated into Thai by the researchers following the WHO procedure for the process of back-translation and adaptation of an instrument.[29] The SKAQ was verified for content validity with three experts in adolescent suicide prevention. The SKAQ comprises 12 items contained within two components: 1) Attitude Questions (AQ) (8 items). Each item is scored on a 4-point scale (1 = Strongly disagree; 2 = Disagree; 3 = Agree; 4 = Strongly agree). The total AQ score ranges from 8-32. The reliability of attitude based on Cronbach's alpha coefficient was tested with group of 10 adolescents, 10 parents, and 10 teachers and values were 0.74, 0.73, and 0.97 respectively. 2) The Suicide Knowledge Questions (SKQ) component has 4 true-false items. Scoring the form is accomplished by dichotomizing each item into a value of 1 (True answer) or 0 (False answer). The possible score ranges 0-4. The reliability of SKQ based on KR20 was tested with groups of 10 adolescents, 10 parents, and 10 teachers and values were 0.84, 0.74, and 0.75 respectively.

In the evaluation phase, the PI encouraged 12 adolescent CWG members, 30 students, 2 parents, 7 school teachers, 3 deputy directors of the school, and the director of the school to share their experience and ideas for refining and integrating the program into the school curriculum and also for assessing the program's ongoing feasibility and appropriateness.



Step 1: Establishing mutual commitment and engaging a core working group

Activities: 1. Contacting school administrator and creating commitment. 2. Engaging core working group (CWG) of 12 volunteer adolescent peer leaders

Step 2: Conducting situational analysis

Activities: Two types of data collected. **Quantitative:** using self-reported questionnaires with 227 adolescents. Qualitative: focus group discussions with 40 adolescents and in-depth interviews with 3 school teachers and 4 parents.

Step 3: Analysis of problems and needs

Activities: Analysis of quantitative and qualitative data.

Step 4: Designing of Thai Suicide Prevention Program for Secondary School Students

Activities: Development of suicide prevention program (contents, the strategies and activities) based on needs assessment results and an action research framework and meeting with CWG members to reflect on the program before implementation.

Step 5: Implementing Program

Activities: Divided into two phases: 1) preparing the 12 CWG members with training sessions, and 2) implementing Program with 165 students, 113 parents and 60 school teachers, collecting data prior to the program and after program implementation.

Step 6: Evaluating Program

Activity: Meeting with CWG implementation team to reflect on Program

Activities: Group reflection with 30 students, 2 parents and 7 school teachers.

Step 7: Critique of Program feasibility

Activities: Meeting with 12 CWG members, 2 parents, 7 school teachers, 3 deputy directors and school director to critique program feasibility.

Figure 1: Processes in Action Research Study

Data analysis

Quantitative data were analyzed with descriptive statistics, and a t-test was used to compare scores pre- and post-training. Qualitative data were analyzed by thematic analysis.[30] Data were grouped into categories based on information that emerged from the transcripts. Emerging themes were identified from each category. Co-investigators reviewed the analysis to verify the appropriate of the categories chosen, and the consistency of coding qualitative data that obtained through participatory activity and group discussion.

Rigor and trustworthiness

This was evaluated using principles developed by Lincoln and Guba[31] to ensure study rigor. Credibility was initiated using triangulation and member checking.

Transferability is established by providing evidence that findings can be applicable to other contexts and was achieved through thick data description. Analysis of data was performed in conjunction with the co-investigators and aclear audit trail established to ensure confirmability and transparency.

Findings

These are reported in two sections: TSPPSSS development and design, and feasibility of program implementation.

1.1 TSPPSSS Development and Design

The critical components of a suicide prevention program for secondary school students in Thailand were outlined in a previous paper[26] and were used as the basis for the design of this program and its various elements as recommended by the National Action Alliance.[22] The Program comprises three modules: 1) *Adolescent Peer Leaders' Module* involving four elements: adolescent peer leaders' enhancement for suicide prevention, raising awareness of adolescent suicide prevention, suicide prevention education and fostering mutual support by adolescent peer leaders; 2) *Parents' Module* comprising three elements: raising awareness of suicide prevention, suicide prevention education and fostering mutual support by family; and 3) *School Teachers' Module* composed of raising awareness of adolescent suicide prevention, suicide prevention education and fostering mutual support by school. The adolescent peer leader module was a one-day workshop training for adolescent suicide prevention that included these critical components. The adolescent peer leader module used an "edutainment" approach that included games, role playing, and video clips. Parent and school teacher modules consisted of 3-hour modules that again included the same components and activities.

1. Program feasibility

Program feasibility and effectiveness were evaluated in two ways: (i) quantitatively, including changes in scores of suicide knowledge and attitude and (ii) qualitatively by exploring improving suicide knowledge and attitude, and opinions of the stakeholders regarding program implementation.

The results of quantitative data from piloting this program indicated significant enhancements in the mean scores of suicide knowledge and attitude among adolescent peer leaders, parents, and school teachers immediately after implementation compared to pre-implementation scores. These findings are summarized in Table 1.

Table 1 Comparisons of Mean Scores of Suicide Knowledge and Attitude among Adolescent Peer Leaders (N = 12), Parents (N= 113) and School Teachers (N=60) before, and immediately after Using Program

Participants	Variables	Before training (Mean ± SD)	Post training (Mean ± SD)	t	Sig. (2-tailed)
Adolescent peer leaders	Suicide knowledge (total: 0 - 4)	2.66 ± 0.77	3.33 ± 0.49	2.96	0.013
	Attitude toward suicide (Total: 8 - 32)	22.41 ± 2.01	26.41 ± 2.23	4.12	0.002
Parents	Suicide knowledge (Total: 0 - 4)	2.48 ± 0.98	3.30 ± 0.91	6.38	0.000
	Attitude toward suicide (Total: 8 - 32)	22.16 ± 3.31	27.38 ± 3.22	11.97	0.000
School teachers	Suicide knowledge (Total: 0 - 4)	2.91 ± 0.90	3.60 ± 0.55	5.69	0.000
	Attitude toward suicide (Total: 8 - 32)	22.21 ± 2.88	27.36 ± 2.63	10.91	0.000

$*P < .05$

Regarding qualitative findings, analysis of the experiences of the stakeholders resulted in two themes and two sub-themes as described below. The following abbreviations are used for different types of participants: APL=adolescent peer leader; S=student; ST=school teacher; P=parent

Theme 1: Improving suicide knowledge and attitudes

Peer leaders described an improvement to their knowledge and attitudes after the Program regarding adolescent suicide as indicated in the following quotes:

> *I learned how to cope with the worst circumstances if I encounter these problems.* (APL, 04)

> *I learned what the risk factors of suicide are and I also realized that a friend of mine is at risk of suicide* (APL, 01)

Parents also mentioned that they had improved suicide knowledge and attitudes:

> *The suicide prevention program for adolescents is a very good research project. I learned how to identify an adolescent who is at risk of suicide. ...I found out about children who were pressured and what the signs of suicide were and about behaviors of children at risk of suicide.* (P, 01)

A school teacher indicated that he had improved his suicide knowledge and attitude stating:

> *This program helps teachers to identify students who are at risk of suicide...also I learned what the causes of adolescent suicide are.* (ST, 06)

Theme 2: It's such a great campaign

Stakeholders' opinions about the feasibility of the pilot Program were unanimous in support of it and were divided into two sub-themes:

Subtheme 1: It's feasible

Most of the adolescents' mentioned that the program was feasible to apply in the school setting, with some indicating they had increased confidence and helped other students to seek help:

> *A campaign of suicide prevention in schools provides adolescent peer leaders with increased confidence; adolescent peer leaders could help other student by telling adolescents to seek help from a trusted adult and giving information about suicide prevention.* (APL, 03)

> *It's such a great campaign. ...I never knew before that when an adolescent has suicided that it affects many people... I learned who I can talk with and where to ask for help. In particular, when I encounter stressful life events, I now can talk with my close friend, teachers, and family.* (S, male, 28)

> *One parent stated that it is:*

> *...a very good research project. This program helps parents to prevent the problem.* (P, 01)

School teachers and administrators also supported that the program was feasible to apply in a school setting and the contents of the program covered all the people in the school context. They also recommended that this program be applied in other schools, in other communities.

> *This is a good program. It is completed as what I have seen.* (Director of School)

> *I think that it is such a good program and it is feasible to apply it in other school contexts. I believe that the program will be a good model for other schools and communities.* (Deputy Director of Student Affair Division)

> *I definitely think that it is possible.... because the contents of the program are created for adolescent peer leaders, ...it targets students, parents, and school teachers. The contents of the program also cover everyone ...it's a good program.* (ST,01)

Sub-theme 2: It's appropriate

The participants stated that the program was appropriate and could help their friends, children, and students solve problems. Some also mentioned that it could be integrated into other schools and communities:

> *The program raised our awareness of the problem. Previously, we never thought that suicide was our problem. After the program started, it made me aware, step by step. It is appropriate for our school.* (ADL, male, 01)

> *It is good to start the program at school. ...it is appropriate for high school students. I think it is a good program. The program provides information for students, and also the program was implemented with parents and school teachers. Thus, school teachers could apply this knowledge to help their students. It helps us understand and have a simple access our students. The program is appropriate and beneficial to our school.* (Deputy Director of Academic Division)

> *Adolescent suicide prevention is not an interesting topic for many people to work with because it's a serious and sensitive issue. ...at first when I heard about the name of this project I thought it was an awful and sensitive topic. After I attended the program, I thought that it was a very good project indeed. Even though the rate of suicide is not high in statistics, it may have an impact on many people surrounding our school if someone commits suicide at our school.* (ST, female, 01)

> *Adolescent suicide prevention is a priority. We cannot reach our children. For instance, my child, I definitely think that my child has no problems but he may be faced with some problems. I don't know. They may not be brave enough to talk to us because they are afraid to talk. ...I also wish this program could be integrated into other schools and communities.* (P, 02)

Discussion

This AR study provides evidence of how to successfully design a program and implement a program to improve suicide knowledge and attitudes among adolescent peer leaders, parents, and school teachers. The qualitative data provides insights into how suicide knowledge and attitudes improved from the pilot program, and were integrated into the school setting. As a result of implementing the pilot program, all participants showed improvements in their suicide knowledge and attitudes, and the results of this study were comparable with the results of a systematic overview of adolescent suicide prevention programs.[21]

The program successfully improved suicide knowledge and attitudes among adolescent peer leaders, parents and teachers when baseline evaluation data was compared. The key success factor was the stakeholders' full involvement and participation in the AR process. In regard to the critical components of suicide prevention program as outlined by the National Action Alliance for Suicide Prevention,[22(p17)] the TSPPSSS incorporated these components in the following ways:

Unity—sharing a vision for broad-based support attainment[22(p17)] In this study students created an active collaboration between the PI and the CWG which motivated the group to be actively involved in all steps of AR process of problem identification, planning, implementation, and evaluation.[27] Action research was an effective way of building a shared vision because the strategies used for program development in this study were: raising awareness; promising all participants opportunities to share and discuss and to be listened to; creating partnerships; building capacity; health care personnel involvement; providing consultation and facilitating. The critical components of the TSPPSSS incorporated the ideas of full involvement, democratic process, liberation and emancipation using AR.[32,33]

Planning—a strategic uses planning process that lays out stakeholder roles and intended outcome[22(p17)] Again the process of AR facilitated clarity in delineating roles for teachers, parents, and adolescent peer leaders. The three modules for adolescents, parents, and school teachers each included the critical components of suicide based on suggestions from the perceptions of these groups regarding the causes and prevention of suicide in secondary school students. The AR processes also involved people from different backgrounds who could identify the related issues and needs amongst the key stakeholders. Conducting a situational analysis in the first stage of the full study among the stakeholders allowed exploration of the critical issues and helped in the development of a suitable program to address stakeholder's concerns. There was an express purpose to encourage parents to raise awareness of caring for their children who were at risk of suicide and related problems, rather than just concentrating on their children's school achievement and study performance. Lastly, the teachers and administrators enabled their support for the whole processes in this study.

Integration— multiple integrated use suicide prevention strategies[22(p17)] This Program built on some strategies of previous ones such as the Lifeline Program and Signs of Suicide (SOS). The Lifeline Program is a school-based suicide prevention program initially developed in 1985 by Kalafat & Underwood[28] and the Signs of Suicide (SOS) was developed by Aseltine & DeMartino in 2004.[13] The major differences from these programs was how they addressed the needs, concerns and the strategies used for development of the Program in this study.

Fit—activities alignment with context, culture, and readiness[22(p17)] Extensive consultation with stakeholders ensured that all the AR processes and program activities were tailored to the school context. They were based on the stakeholders' needs and concerns and developed in a culturally appropriate manner incorporating input from students, parents and teachers as well as incorporating evidence-based interventions and expert clinical advice.

Communication—Clear, open, and consistent communication[22(p.17)] During the project the PI ensured that communication was optimised by holding regular meeting with school administrators, school teachers, adolescent peer leaders, and parents to create mutual understandings by sharing experiences and concerns about adolescent suicide risk behaviors and suicide prevention in schools. The adolescent peer leaders committed themselves to be as members of the CWG while the school provided practical support, and the PI took on the role of a facilitator by providing technical support throughout the study, recording discussions and taking responsibility for overall coordination.

Data—surveillance use and evaluation data to guide action, assess progress, and make changes[22(p17)]. Qualitative and quantitative data were collected through out to identify risk and protective factors and project effectiveness and feasibility, and make necessary changes along the way. An evaluation of the outcomes of the program was conducted, using both quantitative and qualitative data.

Sustainability—A focus on long-lasting change[22(p17)] There was a long-term aim of implementing it with ongoing support from the pilot site, and then rolling out the Program to other schools in Thailand using the learning from the pilot. It is hoped that all participants use the skills and knowledge gained to provide a supportive environment in terms of school policy and action plans to enable adolescent peer leaders to continue their roles as leaders for effective adolescent suicide prevention in the school.

Limitations

Evaluating the efficacy of school-based preventive interventions of suicidal behaviours is problematic because of the number of variables involved. Secondary school students who had attempted suicide or who were at risk of suicide were not including in this study so valuable learning from their experiences was a limiting factor. Also, this study had limitations in the evaluation of outcomes. Suicide knowledge and attitude among the participants were measured only in those who attended the program and the long-time effects of the program have not yet been assessed: this is a common difficulty for adolescent suicide prevention programs because of issues of confidentiality. However, the Program was positively evaluated by stakeholders and succeeded in the short-term to raise awareness and assist parents and teachers to identify at-risk students.

Conclusions

The TSPPSSS is preliminary program that needs further testing. However, it can be used as a framework for nurses and other health professionals for implementing with adolescents who have been recognized as being at-risk of suicide. In a more general way it can be useful to enhance protective factors as well as good partnership with both families and schools, so as to promote adolescent mental health. Understanding the complex interaction among the social, cultural and environmental factors that contribute to adolescent suicide risk behaviors by applying an AR approach was very helpful in this study, and preliminary results study successfully demonstrated that the suicide prevention for secondary school students was effective in its aim to promote suicide awareness and knowledge. The key outcomes and actions of the adolescent peer leader group included enhancing their leadership skills, raising the awareness of the school students, providing a suicide prevention education and fostering mutual support. For the parents' and teachers the key actions included raising awareness, education and fostering mutual support by family or within the school. To determine its effectiveness and possible modification in future, the TSPPSSS should be tested in future research in other settings and tailored to address different school contexts.

Implications for Nursing Practice and Research

This study demonstrated that a group of nurses can perform a vital role in universal suicide preventive intervention in schools, and that nurses can work to enable collaboration between schools, families, and health care professionals to adapt an appropriately program for this population. Furthermore, nurses need to be involved in such research if health promotion and primary prevention strategies are to succeed for the benefit of adolescent mental health and suicide prevention. Nursing involvement in the design and ongoing implementation and evaluations of programs using context-specific studies such as this can be very useful to addressing health issues such as depression, sexual health, and substance use.

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References

1. World Health Organization. Global Strategy for Women's, Children's and Adolescents' Health (2016-2030) 2018 Monitoring report: Current Status and Strategic Priorities [Internet]. 2018 [cited 6 August 2018]. Available from: http://www.unaids.org/sites/default/files/media_asset/EWECGSMonitoringReport2018_en.pdf
2. Ekasawin S, Phothisut C, Chomcheun R. The prevalence of psychiatric disorders in Thai students aged 13-17 years. J Ment Health Thai. 2016; 24(3): 141-153.
3. Rungsang B, Chaimongkol N. The prevalence of suicidal ideation among high school students in Thailand and its potential related risk factors. Thai Pharm Health Sci J. 2017;12(1):31-5.
4. Ministry of Public Health. E-report 2016 [Internet]. 2016 [cited 2018 August 6]. Available from: https://www.dmh.go.th/report/suicide/
5. Robinson J, Cox G, Malone A, Williamson M, Baldwin G, Fletcher K, et al. A systematic review of school-based interventions aimed at preventing, treating, and responding to suicide-related behavior in young people. Crisis. 2013;34(3):164-82.
6. Bergen H, Hawton K, Waters K, Ness J, Cooper J, Steeg S, et al. Premature death after self-harm: a multicentre cohort study. Lancet. 2012;380(9853):1568-74.

7. Borges G, Nock MK, Abad JMH, Hwang I, Sampson NA, Alonso J, et al. Twelve month prevalence of and risk factors for suicide attempts in the WHO World Mental Health Surveys. J Clin Psychiatry. 2010;71(12):1617-28.
8. Zalsman G, Hawton K, Wasserman D, Van Heeringen K, Arensman E, Sarchiapone M, et al. Suicide prevention strategies revisited: 10-year systematic review. Lancet Psychiatry. 2016;3(7):646-59.
9. Wasserman D, Hoven CW, Wasserman C, Wall M, Eisenberg R, Hadlaczky G, et al. School-based suicide prevention programmes: the SEYLE cluster-randomised, controlled trial. Lancet. 2015;385(9977):1536-44.
10. Vuthiarpa S, Sethabouppha H, Soivong P, Williams R. Effectiveness of a school-based cognitive behavioral therapy program for Thai adolescents with depressive symptoms. Pacific Rim Int J Nurs Res. 2012;16(3):206-21.
11. N, Deoisres W, Wongnam P. Suicidal ideation among Thai adolescents: An empirical test of a causal model. Pacific Rim Int J Nurs Res. 2017;21(2):97-107.
12. Thanoi, W., Phancharoenworakul, K., Thompson, E. A., Panitrat, R., & Nityasuddhi, D. (2010). Thai adolescent suicide risk behaviors: testing a model of negative life events, rumination, emotional distress, resilience and social support. Pacific Rim International Journal of Nursing Research, 14(3), 187-202.
13. Aseltine RH, James A, Schilling EA, Glanovsky J. Evaluating the SOS suicide prevention program: a replication and extension. BMC Public Health [Internet]. 2007 [cited 2018 August 6];7:161. Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-7-161
14. Sawyer MG, Pfeiffer S, Spence SH, Bond L, Graetz B, Kay D, et al. School-based prevention of depression: a randomised controlled study of the beyond blue schools research initiative. J Child Psychol Psychiatry. 2010; 51(2):199-209.
15. Stone DM, Crosby AE. Suicide prevention: state of the art review. Am J Lifestyle Med. 2014;8(6):404-20.
16. Miller DN, Eckert TL, Mazza JJ. Suicide prevention programs in the schools: a review and public health perspective. School Psych Rev. 2009;38(2):168-188.
17. Checkland P, Holwell S. Action research. In Kock N, editor. Information systems in action research: an applied view of emerging concepts and methods. New York: Springer; 2007. p. 3-17.
18. Candace L. Knowledge development with adolescents in a PAR process. Educ Action Res. 2008;16(2): 221-233.
19. Tsourtou V, Hatzinikolaou K, Chatzinikolaou C. Action research with children and adolescents working on the streets of Athens., Greece. Dev Pract. 2014;24(3): 313-326.
20. Goldston DB, Molock SD, Whitbeck LB, Murakami JL, Zayas LH, Hall GC. Cultural considerations in adolescent suicide prevention and psychosocial treatment. Am Psychol. 2008;63(1):14-31.
21. Mann JJ, Apter A, Bertolote J, Beautrais A, Currier D, Haas A, et al. Suicide prevention strategies: a systematic review. JAMA. 2005;294(16):2064-74.
22. National Action Alliance for Suicide Prevention. TRANSFORMING COMMUNITIES: Key Elements for the Implementation of Comprehensive Community-Based Suicide Prevention. Waltham, MA: Education Development Center; 2017.
23. Kaesornsamut P, Sitthimongkol Y, Williams RA, Sangon S, Rohitsuk W, Vorapongsathorn T. Effectiveness of the BAND intervention program on Thai adolescents' sense of belonging, negative thinking and depressive symptoms. Pacific Rim Int J Nurs Res. 2012;16(1):29-47.
24. Vuthiarpa S. Cognitive Behavioral Therapy for adolescents with depression and suicidality. J Sci Technol. 2012; 20(5):457-67. (in Thai)
25. Reangsing C. The effects of the rational-emotive behavior therapy group program on the levels of depression amongst secondary school students. J Nurs Educ. 2013;6(2):29-41. (in Thai)
26. Chaniang S, Fongkaew W, Sethabouppha H, Lirtmunlikaporn S, Schepp G. K. Perceptions of adolescents, teachers and parents towards causes and prevention of suicide in secondary school students in Chiang Mai. Pacific Rim Int J Nurs Res. In Press.
27. Holter IM, Schwartz Barcott D. Action research: what is it? How has it been used and how can it be used in nursing?. J Adv Nurs. 1993;18(2):298-304.
28. Kalafat J, Underwood M. Lifelines: A school based adolescent suicide response program Dubuque. Iowa: Kendall/Hunt; 1989.
29. World Health Organization (WHO) [Internet]. Process of translation and adaptation of instruments. 2018 [cited 2018 August 6]. Available from: http://www.who.int/substance_abuse/research_tools/translation/en/

30. Miles MB, Huberman AM, Saldaña J. Qualitative data analysis: a methods sourcebook and the coding manual for qualitative researchers. Thousand Oaks, CA: SAGE, 2013.
31. Lincoln SY, Guba EG.Naturalistic inquiry. Newbury Park: Sage; 1985.
32. Lindquist-Grantz R. Youth participatory action research as a strategy for adolescent suicide prevention [Dissertation]. Cincinnati, OH: University of Cincinnati; 2017.
33. Rodríguez M, Huertas IB. Suicide prevention in college students: A collaborative approach. Interam J Psychol. 2013;47(1):53-60.

การพัฒนาและประเมินผลโปรแกรมการป้องกันการฆ่าตัวตายสำหรับนักเรียนระดับมัธยมศึกษาตอนปลาย

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บทคัดย่อ: การฆ่าตัวตายในวัยรุ่นนับเป็นปัญหาที่สำคัญทางด้านการสาธารณสุขในหลายประเทศทั่วโลกรวมทั้งประเทศไทยและการป้องกันการฆ่าตัวตายสำหรับนักเรียนในระดับชั้นมัธยมจึงมีความสำคัญเป็นอย่างยิ่ง การศึกษานี้มีวัตถุประสงค์เพื่อพัฒนาและประเมินผลโปรแกรมการป้องกันการฆ่าตัวตายสำหรับนักเรียนมัธยมศึกษาตอนปลายที่สอดคล้องกับบริบทของสังคมไทย การวิจัยเชิงปฏิบัติการ (Action Research) โดยอาศัยการมีส่วนร่วมของผู้มีส่วนได้ส่วนเสีย ได้แก่ นักเรียนชั้นมัธยมศึกษาตอนปลาย ผู้ปกครอง ครู และผู้บริหารของโรงเรียน ประกอบด้วย 7 ขั้นตอน ได้แก่ 1) การสร้างความร่วมมือ พันธะสัญญาและการจัดตั้งกลุ่มคณะทำงาน 2) การประเมินสถานการณ์ปัญหาและความต้องการ 3) การวิเคราะห์สถานการณ์ปัญหาและความต้องการ 4) การพัฒนาโปรแกรม 5) การนำโปรแกรมไปใช้ 6) การประเมินผลลัพธ์ของ โปรแกรม และ 7) การวิพากษ์ความเป็นไปได้ของ การนำโปรแกรมฯ ไปใช้ การรวบรวมข้อมูลเชิงคุณภาพประกอบด้วยการอภิปรายกลุ่ม และการสัมภาษณ์เชิงลึก และวิเคราะห์ข้อมูลเชิงคุณภาพโดยใช้วิธีวิเคราะห์เชิงเนื้อหา การเก็บรวบรวมข้อมูลเชิงปริมาณโดยใช้แบบสอบถามความรู้และทัศนคติเกี่ยวกับการฆ่าตัวตายและวิเคราะห์ข้อมูลโดยใช้สถิติแบบบรรยาย และวิเคราะห์ด้วยสถิติ T-test เพื่อเปรียบเทียบค่าเฉลี่ยของคะแนนก่อนและหลังการให้โปรแกรมฯ

ผลลัพธ์ของการนำโปรแกรมไปใช้กับนักเรียนแกนนำ ผู้ปกครองและครู พบว่า คะแนนของความรู้เกี่ยวกับการป้องกันการฆ่าตัวตายและทัศนคติเพิ่มขึ้นเมื่อเปรียบเทียบกับคะแนนของความรู้ก่อนนำโปรแกรมไปใช้ อย่างมีนัยสำคัญทางสถิติ และผลจากการสะท้อนคิดของผู้เข้าร่วมโปรแกรม เห็นว่า นักเรียนแกนนำได้พัฒนาศักยภาพของการเป็นผู้นำและความคิดสร้างสรรค์ในการรณรงค์การป้องกันการฆ่าตัวตายในโรงเรียน ผู้ปกครองสามารถสังเกตพฤติกรรมเสี่ยงต่อการฆ่าตัวตายของบุตรหลานวัยรุ่นได้ และครูได้นำความรู้ที่ได้ไปประเมินพฤติกรรมเสี่ยงต่อการฆ่าตัวตายและให้คำปรึกษาได้ จากกระบวนการวิจัยเชิงปฏิบัติการครั้งนี้เป็นหลักฐานเชิงประจักษ์พบว่าพยาบาลสามารถที่จะทำงานในการส่งเสริมสุขภาพและสร้างองค์ความรู้ร่วมกับโรงเรียนและชุมชนได้

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Development of Care Services for Older People with Dementia in a Primary Care Setting

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Abstract: This technical collaborative action research aimed to develop dementia care services for older people in a primary care setting, in central Thailand. Participants included primary care providers, community health volunteers, older people, and caregivers. Data were collected during April 2016 to February 2017 using in-depth interviews, focus group discussions, observations, and document reviews. Qualitative data were analyzed by content analysis, and quantitative data were analyzed by descriptive statistics.

Results: Phase 1 Situational Analysis. The dementia services provided depended on knowledge and understanding of dementia among clients and providers. Clients perceived dementia as an aging process. There was no need for diagnosis and specific care. Providers recognized severe dementia and referred clients to psychiatric hospital; Phase 2 Development. The primary care providers and community health volunteers were educated and trained regarding dementia and screening. Among 319 older people, there were nine with dementia and three with mild cognitive impairment, and those with dementia were referred for proper diagnosis and treatment. Coordination and consultation services were provided on demand and a cognitive stimulation program and home care were provided by nurses. Phase 3 Synthesis. A dementia care service pathway was developed consisting of six services: 1) awareness raising and capacity building; 2) dementia screening; 3) referral for diagnosis and treatment; 4) coordination/consultation services; 5) cognitive stimulation; and 6) home care. We conclude that nurses in Thailand need to be educated and trained to provide better dementia care and the six dementia care services based on the pathway of primary care setting proved be an important strategy to achieve this.

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Introduction

Dementia is one of the most prevalent problems found in older people, and it is known as a major cause of disability and dependency.[1] In 2018, it was reported that there were 50 million older people with dementia worldwide and a new case is diagnosed every three seconds.[2] People with dementia is estimated to reach 152 million by 2050, and 68% of these will be in low and middle-income countries.[1] In 2013, the prevalence of dementia among Thai older people ranged from 2% to 10%.[3] In 2014 the Thai National

Health Survey found that the prevalence of dementia among older people was 8.1%[4] but by 2016, there were 600,000 Thai older people with dementia, and this is estimated to increase to 1.4 million within the next 20 years.[3] It is also estimated that prevalence of dementia increases two-fold every ten years.[5] Dementia tends to increase with age and the dementia rates among older people aged 60-69 years, and 70-79 years were reported at 4.8% and 7.7%, respectively, and the rate went up to 22.6% among those over 80 years.[5]

The World Health Organization (WHO) and governments of various countries have established policies, programs, or projects to cope with these problems; and the WHO launched a ministerial conference on global action against dementia.[6] Health organizations of some countries have established guidelines for dementia care services (DTCS), by using empirical research evidence, for example, the Japanese government launched the Project for Improvement of Medical Care and Quality of Life for People with Dementia in 2008. This enables older people with dementia to gain access to comprehensive and coordinated dementia care services at all levels, including primary care.[7] The Australian government launched the policy, "Dementia Initiative: Making Dementia A National Health Priority and provides community care packages from screening to the end-stage dementia care.[8] Among these countries, community and primary care are the main focus of dementia care service development.

In contrast, Thailand has not yet identified dementia as a national health priority. There are no specific dementia care service for older people and their family caregivers (FCGs), especially at the primary care level.[9] Thailand practice guidelines for dementia care, diagnoses, and treatment are available only at the tertiary care and specialized care levels. Secondary and primary care levels take only a referral role.[10] Results from the development of comprehensive dementia care service system in Thailand both in urban and rural communities, showed that providing dementia care services at all health care levels, including primary care could increase dementia access and improve the quality of life of older people with dementia and their caregivers in the community.[9,11] The expert committee of the Institute of Geriatric Medicine, Ministry of Public Health, Thailand recommended that early detection at primary care level is the key to improve better outcomes.[11]

Evidence shows that Thai people with dementia are usually taken for diagnosis and treatment when the disease has entered the moderate stage with obvious emotional and behavioral changes observed by caregivers.[12] Only one out of six Thai older people are diagnosed by doctors and referred to tertiary care facilities, and 72% of Thai older people with dementia do not receive treatment and 45% lack protection and rehabilitation opportunity due to limited knowledge of caregivers and primary care providers.[12]

Thailand's healthcare services are classified into four levels based on the capacity of staff, size of a unit, amount and type of care, and the degree of specialization. These are: 1) *primary health care* organized by the communities and provided by community health volunteers (CHVs); 2) *primary care*, integrated holistic care provided by healthcare professionals; 3) *secondary care*, a more complicated and specific care located in the community hospitals, provided by generalists and specialized care personnel; and 4) *tertiary care*, more specific and complicated care provided by specialists, located in the regional, general, specialized, and university hospitals. Primary care units and settings at the primary care level are governed by 4 sectors: 1) the district/provincial health office; 2) the community hospital; 3) the municipality or local organization; and 4) the Thai Red Cross.[13]

In this study, the selected primary care unit and setting is under the Thai Red Cross organization and the provincial health office. It is responsible for an urban community comprising of 14.68% of older people.[14] The primary care providers were interested in developing dementia care services for older people in their setting.

Objectives: To study the existing situation of DTCS in the selected PCS; develop dementia care services in the PCS; and describe the outcomes of the development of DTCS.

Conceptual Framework

To develop dementia care services for older people and their families, a situational analysis of the studied PCS and previous knowledge from literature reviews were used as input of the development. The action research cycle based on the work of Kemmis and McTaggart[16] was used to guide the research process: planning, acting, observing, reflecting, and re-planning. The expected output/outcome of the development was the DTCS for older people and their families that were suitable for the primary care setting (Figure 1).

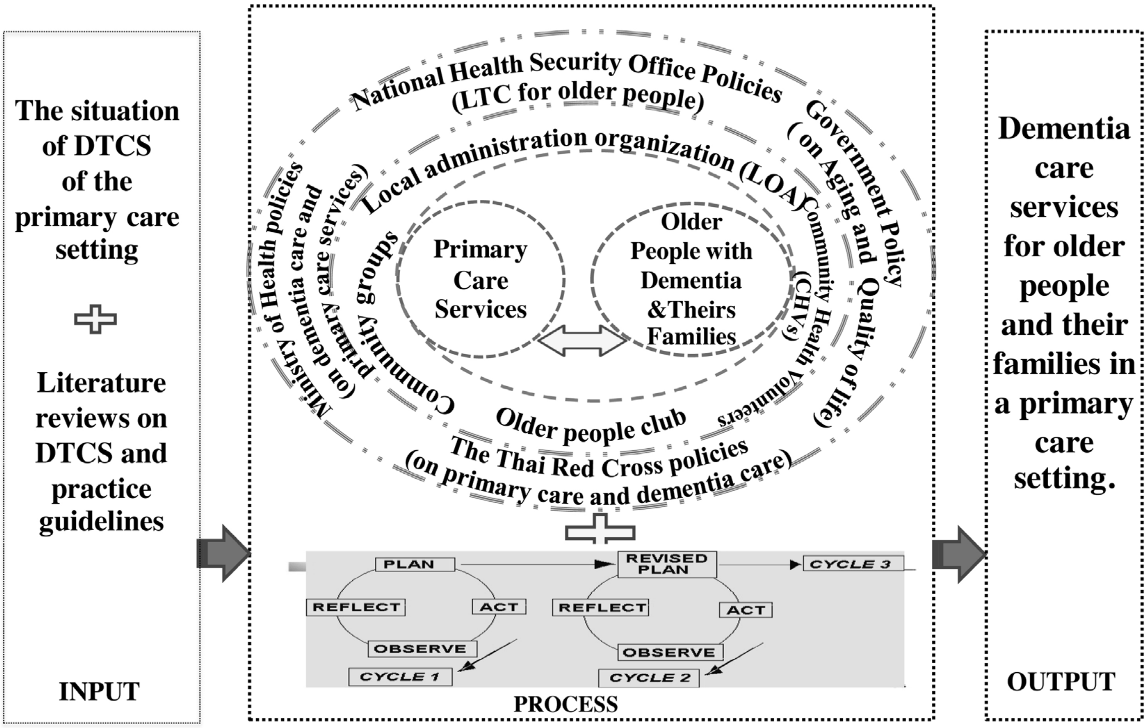

Figure 1 Conceptual framework of the study

Method

Design: This study employed technical collaborative action research.[15-16] It tested solutions from existing knowledge in practice by joint collaborative research agreement.

Study setting: The studied PCS was located in an urban area of a central region, Thailand and the criteria for selection of this was that: 1) the community has entered an aging society, 2) there were older people with dementia, and 3) the administrators and primary care providers agreed to participate in the study.

Participants/Informants: The participants of this study included 14 primary care providers (PCPs), 31 community health volunteers (CHVs), 319 older people, and 12 caregivers (CGs) of older people with dementia. The action research team (AR team) consisted of the researcher and nurses who were key actors.

Research instruments: Two sets of instruments were: dementia screening tools and data collection tools. Dementia screening tools used were recommended by the expert group of Institute of Geriatric Medicine, Ministry of Public Health, Thailand.[11] Three sets of standardized tools were used to classify older people into three groups: normal condition, mild cognitive impaired (MCI), and dementia. The researcher was trained and received permission to use these tools in this study. Some of the screening tools were used by CHVs and nurses in the PCS nation-wide. The three sets of dementia screening tools were as follows:

Set 1: Screening tools assessed by CHVs

The 2Q (Patient Health Depression Questionnaire: 2 Q (PHQ-2) consists of two items with "Yes" or "No" answers regarding depressed mood and loss of interest which is required to establish a diagnosis of DSM-IV depressive disorder.[17] The PHQ-2 into Thai as the consisting of the first 2 questions of the Patient Health Depression Questionnaire - 9 (PHQ-9) and was developed for screening major depression in 2008.[18] The 2Q Thai version's sensitivity and specificity were 80% and 73% respectively.[19] Each item of the 2Q is answered in a "Yes", or "No" format. If older persons say "yes" to either one or two questions, they need to assess for depression by using Thai Geriatric Depression Scale. Those who say no to both questions, meaning no depression, pass this tool and can continue onto the 14Q tool for cognitive test.

The 14 Q (Memory Screening Test)[20] consists of 14 items with a four-point rating scale: 1 = 'the event has not happened yet, or happens once a year;' 2 = 'the event occurs infrequently or twice a month;' 3 = 'the event occurs frequently or nearly every week;' and 4 = 'the event occurs nearly every day.' A score over 40 indicates cognitive problems and the persons need to be tested by the second set of screening tools. The Cronbach's alpha coefficient for this tool was 0.85.

Set 2: Screening tools assessed by PCPs

The Barthel Activity of Daily Living (BADL) Questionnaire[21] was created by Mahoney and Barthel in 1965,[22] and has a 10-item instrument used to assess functional ability by measuring the degree of independence of a person, included feeding, moving from a chair to the bed and returning to the chair, grooming, transferring to and from the toilet, bathing, walking on a level surface, going up and down stairs, dressing, and continence of bowels and bladder, which has a total score of 20 points. The total score of 0-4, means the person is totally dependent; a score of 5-8 means the person is severely dependent; 9-11 indicates moderate dependence, and 12+ is mild dependence. This questionnaire was content validated by the tool developer, and has good structural and criterion validation. The inter-rater reliability is good.[23] The test-retest reliability of the tool for this study was 0.76.

The Instrumental Activity of Daily Living (IADL) Questionnaire[22] was created by Lawton and Brody in 1969[22], which measures the complex ability of older people. It consists of five questions on walking or going out, food preparation or cooking, doing household chores and laundry, exchanging money, and using public transportation. This questionnaire had sensitivity and specificity of 71% and 75% respectively.[24] The test-retest reliability of the questionnaire for this study was 0.95.

The Thai Geriatric Depression Scale (TGDS). This 15-item instrument was adapted from the 30-item Thai Geriatric Depression Scale (TGDS).[25] The short GDS assesses domains of 1) a sad mood and pessimistic outlook, 2) mental and physical energy, 3) a positive or happy mood, 4) agitation or restlessness, and 5) social withdrawal. The response choices for each item are in a "Yes" or "No" format and the cut-off point is 7. The scores of 0-7 points mean having no depression, while the scores of 8 points or higher are considered an indicator of depression.[26] This scale had a sensitivity of 79% and a specificity of 81%, when using a cut-off of ≥ 8.[26] The reliability of this tool for this study was 0.72.

The Mini-Mental State Examination: Thai version 2002 (MMSE-Thai 2002)[10,27] This test consisted of 11 questions: orientation for time (1-5 points), orientation for place (1-5 points), registration (1-3 points), attention/calculation (1-5 points), recall (1-3 points), naming (1-2 points), repetition (1 point), verbal command (1-3 points), written command (1 point), writing a sentence (1 point), and visuo-construction (1 point).

The cut-off points are determined based on the persons' educational levels as follow: 1) An education lower than the primary level, the cut point is a score of 14 or lower, and this scale had a sensitivity of 35.4% and a specificity of 76.8%; 2) An education at the primary level, the cut of point is a score of ≤17, and this scale had a sensitivity of 56.6% and a specificity of 93.8%; and 3) An education higher than the primary level, and the cut of point is ≤22, and this scale had a sensitivity of 92% and a specificity of 92.6%

The above tools were used to classify older people in this study into either normal condition or dementia. Older people who had scores below the cut off points were considered to be suspect with cognitive problems or dementia and needed to be tested with the third set of screening tools. The test-retest reliability of the tool for this study was 0.95.

Set 3: Screening tools assessed by PCPs.

The Thai version of the Montreal Cognitive assessment (MoCA-T). This version was translated by Solaphat Hemrungrojn.[10] This test is designed as a rapid screening tool for MCI. It is a paper-and-pencil tool that assesses multiple cognitive domains including attention, concentration, executive functions, memory, language, visuo-spatial skills, abstraction, calculation, and orientation. The full score is 30 points, with a cut off score <25, adding 1 point for participants with ≤ 6 years of education, and the sensitivity and specificity were 80% and 80%.[28,29] The test-retest reliability of the tool for this study was 0.98.

Other data collection tools comprised in-depth interviews and observation guidelines, data recording forms, and field notes. These tools were validated by three experts, two working in dementia care and the other an expert in qualitative research.

Research process

The research process comprised of three phases: situational analysis, development and synthesis phases (Figure 2).

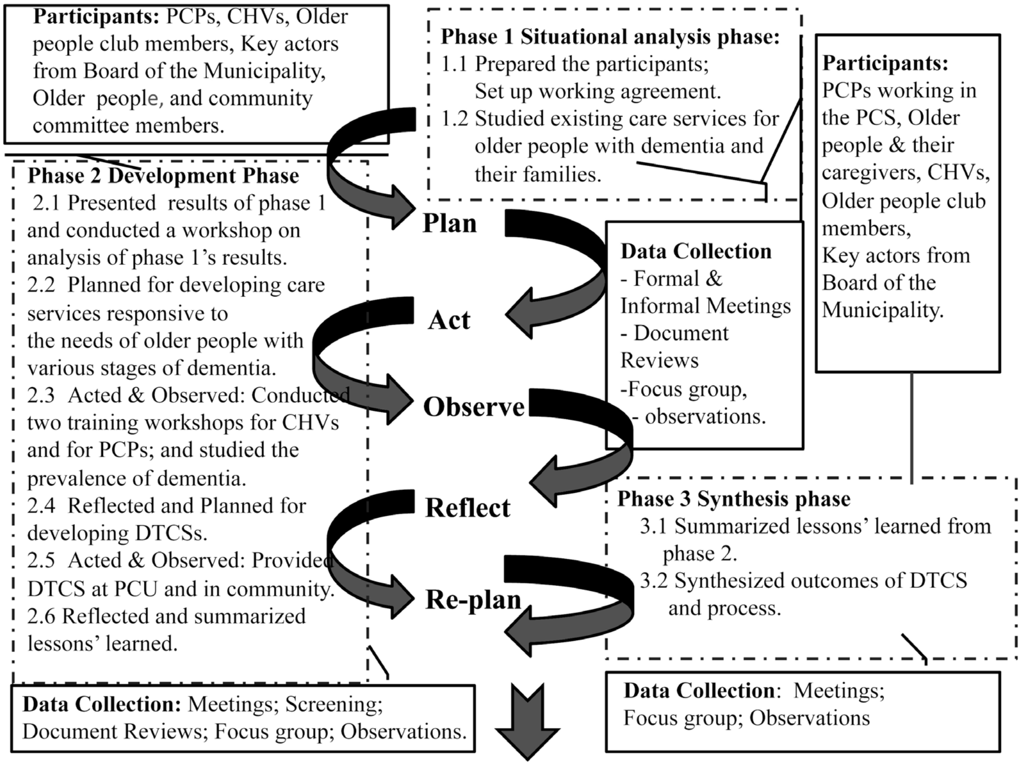

Figure 2 Research process of the study

1. The situational analysis phase

This phase explored existing dementia care services for older people and their families of the studied PCS. Key informants were 14 PCPs (12 nurses and two multidisciplinary care team members), 31 CHVs, two members of older persons′ club, and two key staff from the Board of the Municipality. Data were collected via formal and informal meetings, document reviews, in-depth interviews, focus group discussions (FGDs), and participation and non-participation observations, and an AR team was formed to work on development of dementia care services.

2. The development phase

The development of dementia care services started with dementia case findings by screening older people in the community. Two training workshops were conducted; one for CHVs and the other for nurses to ensure their capability of administering the standard tools. The screening tool set-1 was used to assess community older people by 31 trained CHVs. Of the total 985 older persons, 319 older persons (32.38%) participated in the dementia screening process. The screening tools set 2-3 were used by 14 trained nurses to assess older people who met the criteria from set-1 and set-2, respectively.

The AR team met formally and informally to plan, act, reflect, and re-plan the dementia care services for MCI and dementia groups. Key informants consisted of 14 PCPs, four CHVs, seven members of the older persons’ club, and two representatives from the Board of the Municipality. Data were collected via focus group, in-depth interviews, observations, informal conversations, and document reviews.

3. The synthesis phase

Dementia care service provision that were learnt about in the development phase were summarized and synthesized. The participants of this phase included PCPs, CHVs, members of the older persons’ club, and representatives from Board of the Municipality. Formal meetings and FGDs were conducted to reach the consensus among participants.

Ethical Considerations

This research was approved by the Human Research Committee of Khon Kaen University, HE582362. The researcher provided clear and sufficient information for prospective participants’ decision to be research volunteers. They were given the opportunity to consult with others before making the decision to take part in the study. The researcher assured the participants that the data collected from them would be kept strictly confidential and used codes instead of the real name, and the actual study site and participants’ identities were kept confidential throughout. Signed consent forms were used to confirm the participants’ agreement with the study.

Data analysis

Quantitative data were analyzed using descriptive statistics such as frequency and percentages. Qualitative analysis was performed by content analysis[30] in six steps: Step 1, Read and understand the wording from several types of information derived from various sources and data collection methods (interviews, FGDs, observation); Step 2, Identify the coding and then consider the key point of the code is set to the index; Step 3, Compile data with the same index code. To create categories, each group needed to be homogeneous and in some categories sub-categories were formed. Step 4, Consider content in each subject group. Compare data, interpret and create conclusions; Step 5 Consider conclusions, interpret and examine the meaning; and Step 6, Writing the conclusion. An example of this process is given below:

Data (Code of key informant)	Coding index	Category
Focus group: PCPs.		
PCP 2: If there is a patient with forgetfulness and mental problems, we will send him or her to the psychiatric hospital. We know that we do not have a doctor, a specialist in this way	Referral service for diagnosis & treatment provided for a patient with suspected dementia. (Coding 42)	Dementia care service at PCU: Referral service
Home visit to person with dementia:		
Family caregiver: A nurse visited my mom at home. She suggested me (FCG) to send her (mother) to the psychiatric hospital. Since I have to work, I would rather keep her at home.	Home visit & referral service for a patient with suspected dementia.	Dementia care service at home: Home visit & referral service

Trustworthiness

The credibility of the study was ensured by data triangulation from different data sources and by the member check with PCPs. Data and study results were shared and verified by the representatives of each group, including older people, FCGs, CHVs, and PCPs of all sectors. Data were peer debriefed with the advisory team. Dependability of the study was confirmed by describing the research process clearly and in a systematic manner, detailing each step of each phase, known as the audit trail. Transferability was done by comparing the result of the studied site to other PCSs. Conformability of the study was assured when the credibility, dependability, and transferability were undertaken. The developed dementia care services of this primary care setting can be compared and applied to other sites within urban contexts.

Findings

Phase 1: The situational analysis phase

Results showed *dementia care services* provided at the primary care setting depended on *knowledge and understanding on dementia* of primary care providers and clients. Data revealed three main categories of understanding and care services provided for older people with dementia as followed: Category 1) dementia was normal aging process – self-care at home or no specific care service was needed; Category 2) dementia was a condition of disability – home care service was provided; and Category 3) dementia was a mental health problem – referral service to psychiatric hospital was provided. Because of the understanding regarding dementia as normal aging, disability, and mental health problems; three types of services: self-care, home care, and referral care services were provided by PCPs of the PCU.

Category 1: *Dementia is a normal aging process*

Self-care at home or no specific care service was needed. Both PCPs and clients believed that forgetfulness and/or dementia was common in older people. One provider said, "Dementia is a natural consequence of being old. I suggest a family caregiver to take care of them (older people) at home." Another provider stated "Dementia is a common symptom in elderly, there is no need to be treated. Family members need to take care of them". An older man said, "We get demented when we are old." One older lady stated, "If you were old like me, you will understand (forgetfulness)," while another woman added, "We must actually face forgetfulness when we get old." One family caregiver explained, "Dementia is a normal process that cannot be treated...It is a waste of time and money to seek diagnoses and treatment."

Category 2: *Dementia is a condition of disability*

Home care service was provided. One PCP used the clinical symptoms of "inability to walk, to eat, and to talk" to differentiate normal older people from people suspected of dementia. One nurse added, "Older people with dementia cannot help themselves in daily life tasks, they do need assistance from others. We usually provide a home visit to these clients." Since this was an urban community, most of the CHVs were busy with their own work and were reluctant to do home visits due to their safety and work issues. One CHV said, "We prefer to do a home visit, but we are concerned about our safety and competency. A home health care nurse is better than us. Thus, home care services of this PCU usually done by nurses".

Category 3: *Dementia is a mental health problem*

Referral service to a psychiatric hospital was provided. "Dementia is a matter of psychiatric problems." This statement was reflected by most of the PCPs. They viewed older people with behavioral and emotional disorders of dementia as those with psychiatric problems that needed to be referred to the psychiatric departments/hospitals. Some of the nurses said that they studied this disease in the psychiatry subject. One nurse stated that "I could remember, I had learned about dementia in psychiatric nursing subjects in 3rd years, although I already forgot its content." Another added "I am not a psychiatric nurse, if I found older people suspected of dementia, I will refer them to the psychiatric department/hospital, and treatment could not help them getting better." It was observed that some FCGs took older people with emotional and behavioral problems of dementia directly to the psychiatric department at a tertiary care level for diagnosis and treatment.

Phase 2: The development phase. ***Development of dementia screening services at the PCS.***

Preparation of PCPs and clients: Findings from Phase 1, were discussed among the AR team to plan for developing dementia screening services in the community and at the PCU by trained CHVs and nurses. The CHVs were reluctant to screen older people at home. Thus, 14 PCS nurses agreed to take roles in all screening tools. Four CHVs helped in spreading out information to older people and their families to participate in the study throughout the community.

Dementia screening process: When implementing the 14Q tool, nurses reflected that this tool took longer time than the familiar Abbreviated Mental Test (AMT) recommended by the National Health Security Office's guideline.[31] The AR team then, revised the plan using the brief AMT, a 10-item scale instead of the 14Q. The original AMT tool was introduced by Hodkinson in 1972 as a quick screening tool for assessing intact of short- and long-term memory, attention, and orientation.[32] A score of 7 was the cut-off point suggesting cognitive impairment.

In total 319 participants were assessed (249 at PCU and 70 in the community). Findings showed 307 older people met normal criteria for all research instruments (96.2%), three had mild cognitive impairment or MCI (0.9%), and nine of them were suspected as having dementia (2.8%).

Dementia screening services at chronic care clinics: Three participants who passed the AMT test had attended the non-communicable diseases (NCD) clinic to consult their forgetfulness symptoms with the nurses and asked for further investigation. A client said, "Forgetfulness that was not normal condition but not crazy, called Ting Tong (in Thai)". After the screening, they were identified as MCI group. The AR team agreed to add dementia screening services to the NCD clinic at the PCU and in community. However, these screening services could not be provided regularly due to other urgent work and/or direct policies from the Provincial Health Office (PHO), local administration organizations (LAOs), and/or the Thai Red Cross.

Development of dementia referral services:

Dementia referral care services: Two out of nine participants identified with dementia, their FCGs agreed to be referred for diagnoses and treatments to the neurological department of the secondary care hospital. The FCGs of four participants with dementia made a decision to keep them at home. One FCG wanted to get referral services later. The FCGs of three participants with severe dementia, wanted to take care of them at home. Dementia care plans were put into online health databases (JHCIS) of the PCU in order to coordinate care among PCPs and with upper care level.

Development of Dementia care services.

Non-pharmacological treatment and care services: Since specific pharmacological treatment for dementia was not available at the PCU, ***cognitive stimulation activity*** was conducted for various groups with dementia. The *group-cognitive stimulation* was performed by trained nurses at the NCD and geriatric clinics every Tuesday. Activities included practices of calculation, concentration, listening to and writing the news from the radio/TV, playing maze games and recall games, and doing homework assignments. It was noted that older people who held a bachelor's degree did all homework exercises and enjoyed activities, while older people who finished primary school did not enjoy doing homework. Nonetheless, older people were active participants in all activities provided at the clinics. Three participants with MCI were members of the older people's club which had regular social activities every evening from Monday to Friday, including yoga and dancing activities.

Development of dementia home care services:

Home care services for nine with dementia were provided by nurses. Specific dementia care activities were added to the care plan of each individual/family, especially for three participants in a severe stage of dementia. According to Thailand long term care (LTC) policy, the CHVs were trained to be community caregivers of LTC older people/patients at home.[33] However, these trained CHVs did not perform their roles. In this study, the FCGs, mostly daughters of older people, sacrificed their work and lives to take care of their parents with dementia. Some needed trusted persons to help take care of participants with dementia, while others needed information and advice on emergency and symptom management, and on welfare of disability rights. Two FCGs asked for aide on wheelchairs and some medical supplies.

Phase 3: The synthesis phase.

The outcomes from the development of dementia care services at the primary care setting comprised six activities/services: 1) awareness raising and capacity building; 2) dementia screening; 3) referring for diagnosis; 4) coordination/consultation of treatment and care (including welfare for disability' rights); 5) cognitive stimulation programs; and 6) home care. Nurses played key roles in providing six dementia care services for older people with dementia at primary care settings.

The dementia care service path way was synthesized and proposed as the guideline for the primary care setting (Figure 3).

Dementia Care Services Provision in a Primary Care Setting

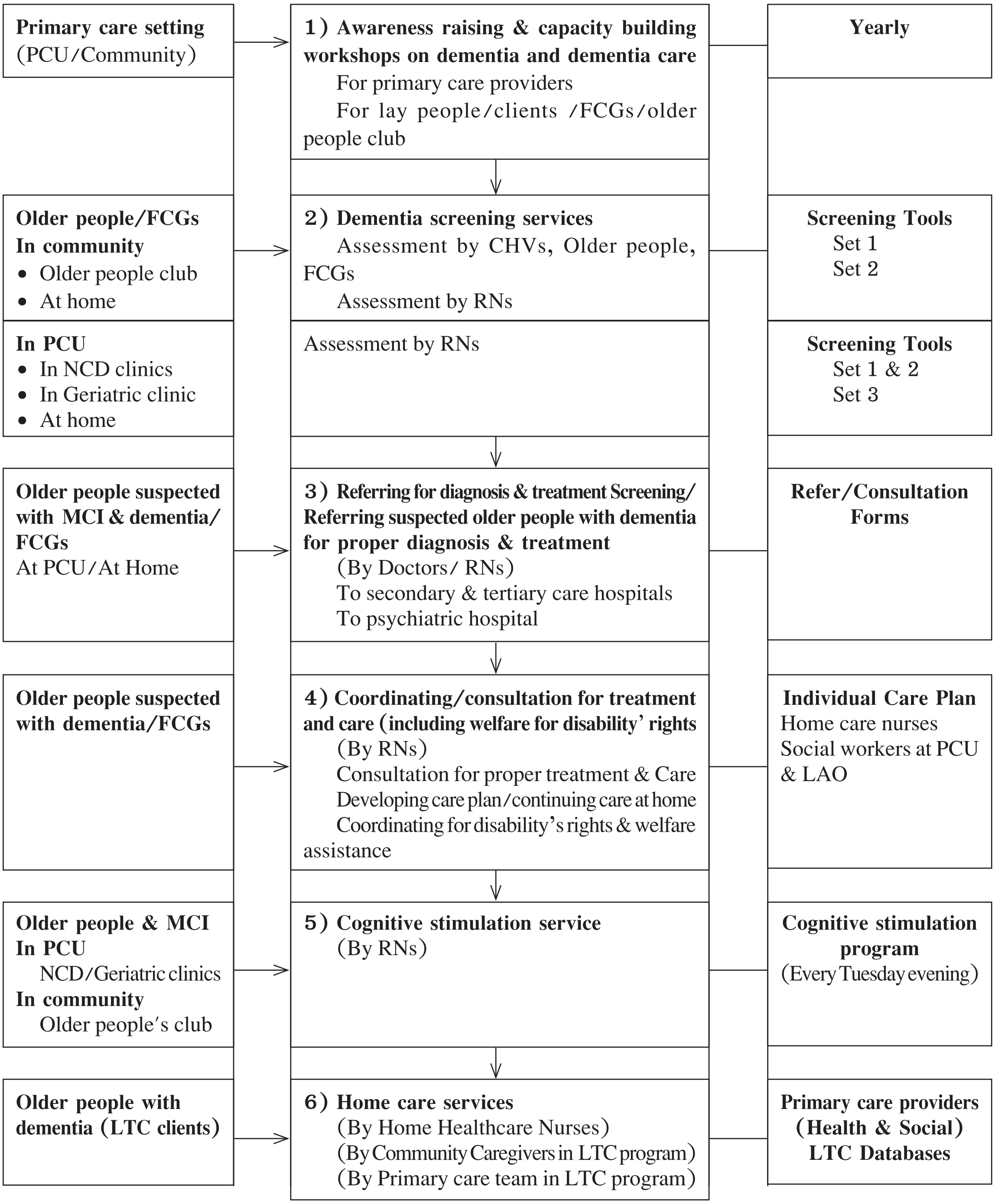

Figure 3 The synthesis of dementia care services path way for older people and their families in a primary care setting.

Discussion

Results from the situational analysis phase showed that DTCSs provided at the PCS depended on knowledge and understanding of clients and providers. Previous studies reported that general healthcare professionals including nurses perceived dementia as a natural aging process and/or mental health problems.[9,11] Thus, there was no need for diagnosis and treatment; but there was a perceived need to go to psychiatric hospital when having psychiatric symptoms. Both PCPs and FCGs tended to take care of them at home. Thus, older people did not get access to dementia services for early detection and proper management.

Results of the *screening service development* showed that at least nine older people were identified as having dementia, three had severe dementia and three had MCI. The prevalence of dementia in this study was 2.8%. Compared to the data from the Thai National Health Survey in 2014 reported that the prevalence of dementia among older people was 8.1%.[4] Findings from the studies in urban areas of the central region of Thailand reported the prevalence of 5% in older people club-based, and 18.6% in community-based groups.[34-35] The prevalence of dementia of this study may have been under-reported due to the new experience of PCPs in providing completed dementia screening services using unfamiliar three sets of tools. Enhancing the capability of PCPs/nurses together with using more appropriate screening tools could help early detect people with dementia in the primary care setting.

The development of referral service for dementia diagnosis and care management was challenging for the primary care setting due to the knowledge about dementia care of the PCPs. Although, there is the referral guideline, older patients with suspected of dementia were not referred for diagnosis, treatment and care. A previous study reported that Thai older people with dementia were under-diagnosed and did not receive necessary treatment and care.[12] Older people in this study needed to gain more access to proper diagnoses and care management based on types of dementia. The collaboration among healthcare team at all levels to ensure appropriate diagnosis and management of dementia needs to be further developed. PCPs need to be educated and trained to provide screening and referral services for older patients suspected of MCI and dementia both at the clinic and in the community.

The development of *dementia home care services* was limited due to less awareness of dementia of FCGs and CHVs. Evidence has shown that FCGs are determined to take care of their older people at home despite limited resources and understanding about dementia care.[12] It was found that some FCGs did not allow older people with dementia join community activities. Even though they suffered from caregiving duties, they rejected home visits by nurses and CVHs due to stigma of dementia. There is the need to raise awareness and build capacity of nurses/PCPs, FCGs, and CHVs in the setting. The good practice of home care guidelines should be developed to increase acceptance of dementia home care services by nurses and CHVs. When providing home care, nurses and CHVs need to be aware of the stigma regarding dementia and be sensitive to the issues when caring and communicating with FCGs and neighbors of older people with dementia. It is suggested that knowledge sharing and learning through group support could help increase understanding and acceptance regarding dementia care for older people with dementia.[36]

The dementia care service pathway suggests that each primary care unit should provide all six dementia care services: 1) awareness raising & capacity building; 2) screening; 3) referring for proper diagnosis and management; 4) coordinating care & consultation; 5) cognitive stimulation; and 6) home care. Continuity of these care services could improve access to dementia care services. Nurses played key roles in all services of the DTCS pathway, especially in screening service, cognitive stimulation and home care.

Conclusion and Recommendations

In preparing to face a growing aging population with dementia, nurses and primary care providers should take leading roles in developing dementia care services by implementing this DTCS pathway at the primary care settings in the future. This developed DTCS pathway need to be tested, and refined in other primary care settings within urban and rural contexts. Nurses as well as PCPs should be educated and trained to provide six dementia care services using appropriate screening tools.

Limitations of the study

The primary care setting of this action research was located in an urban area, the central region of Thailand. Unlike others, this studied primary care unit was under the Thai Red Cross Society and the Provincial Health Office. The PCU has both primary care and disaster relief functions of the Thai Red Cross. Due to the structures and functions that differ from other PCUs, the dementia care service pathway may need to be adjusted when applied to other primary care settings.

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References

1 World Health Organization. Dementia: a public health priority. 2012. [cited 2016 Mar 30]. Available from: https://extranet.who.int/agefriendlyworld/wp-content/uploads/2014/06/WHO-Dementia-English.pdf

2. Patterson C. World Alzheimer Report 2018: The state of the art of dementia research: New frontiers. 2018 [cited 2018 Oct 10]. Available from: https://www.alz.co.uk/research/WorldAlzheimerReport2018.pdf?2

3 The National Committee for the Elderly. Situation of the Thai Elderly 2016. Bangkok: TGRI; 2016.

4 Thai Gerontology Research and Development Institute [TGRI]. Situation of Thai older person 2014. Bangkok: TGRI; 2014.

5 Aekplakorn W, editor. Thai National Health Examination Survey, NHES V in 2014. Bangkok: Health Systems Research Institute; 2016.

6 World Health Organization. First WHO ministerial conference on global action against dementia. 2015 [cited 2015 Jul 25]. Available from: http://www.who.int/mediacentre/events/meetings/2015/global-action-against-dementia/en/

7 Hiroyuki H, Katsunori K , Tokunori T, Ichiro K. Social interaction and cognitive decline: Results of a 7-year community intervention. Alzheimer's & Dementia: Translational Research & Clinical Interventions. 2017 3: 23-32

8 Department of Health and Human Services Victoria. A guide to services for people with dementia and their carers. 2012 [cited 2015 Jul 31]. Available from https://www2.health.vic.gov.au/about/publications/policiesandguidelines/a-guide-to-services-for-people-with-dementia-and-their-carers-2012

9 Sritanyarat W, Aroonsang P, Leethong-in M, Piyawattanapong S, Panpanich L. Synthesis of continuing care services system for older persons : case studies of older persons with stroke and with dementia. Khon Kaen: KlungNana Press; 2015.

10 Prasat Neurological Institute, Department of Medicine. Clinical practice guidelines: dementia. Bangkok: Prasat Neurological Institute; 2014.

11 Sritanyarat W, Aroonsang P, Leethong-in M, Piyawattanapong S, Subindee S, Kumniyom N, et.al. Development of comprehensive care system for older people with dementia: a case study of Ban Fang district, Khon Kaen province. Khon Kaen: Klung Nana Press; 2017.

12 Sihapark S, Chuengsatiansup K, Tengrang K. The effects and caregiving burdens of older people in long-term care based on Thai culture. Nonthaburi: Health Systems Research Institute; 2014.

13 Tangcharoensathien V editor. The Kingdom of Thailand health system review. Health Systems in Transition. 2015 [cited 2018 Oct 10]. Available from http://www.who.int/iris/handle/10665/208216

14 Health Promotion Centre Region 5. Official report on percentage of health care promotion districts with long term care. 2017 [cited 2017 Apr 30]. Available from http://hpc5.anamai.moph.go.th/inspect/web/fileupload/20170704110742ORYRBHTPD3P2.pdf

15 Koshy E, Koshy V, Waterman H. Action research in healthcare. London: SAGE; 2011

16 Fongkaew W, Nilvarangkul K. Special Issues and Implications in Action Research. Pacific Rim International Journal of Nursing Research. 2018 22(8): 175-177

17 Kroenke K, Spitzer RL, Williams JB. The Patient Health Questionnaire-2: validity of a two-item depression screener. Med Care. 2003 41(11):1284-92

18 Manote L, Sutida S, Ratana S. Reliability and validity of the Thai version of the PHQ-9. BMC Psychiatry. 2008 [cited 2018 Oct 10]. Available from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2443128/pdf/1471-244X-8-46.pdf

19 Lee S, Dajpratham P. Criterion validity of the Thai version of the PHQ-9 and the PHQ-2 for screening major depression in Thai elderly. J Thai Rehabil Med. 2017 [cited 2018 Oct 10]. Available from http://rehabmed.or.th/main/wp-content/uploads/2017/04/L-422.pdf

20 Alzheimer's and Related Disorders Association of Thailand. Screening for cognitive impairment (14Q). 2015 [cited 2016 Mar 30]. Available from http://www.azthai.org/download/2558/aug/14.pdf?dl=0

21 Institute of Geriatric Medicine, Ministry of Health. A guide to healthy older screening for community health volunteer. Nontaburi: Institute of Geriatric Medicine; 1999.

22 Karuncharernpanit S. The relationships between balance, activities of daily living and cognitive function of older people in Ban Pong District, Ratchaburi province. Thai Journal of Nursing. 2014 63(4): 20-28

23 Richards SH, Peters TJ, Coast J, Gunnell DJ, Darlow M, Pounsford J. Inter-rater reliability of the Barthel ADL Index: How does a researcher compare to a nurse?. Clinical Rehabilitation. 2000 14(1): 72-78

24 Cromwell D, Eagar K, Poulos R. The performance of instrumental activities of daily living scale in screening for cognitive impairment in elderly community residents. Journal of Clinical Epidemiology. 2003 56(2): 131-137

25 Wongpakaran N, Wongpakaran T. Prevalence of major depressive disorders and suicide in long-term care facilities: a report from northern Thailand. Psychogeriatrics. 2012 12: 11 - 7

26 Wongpakaran N, Wongpakaran T, Van Reekum R. The use of GDS-15 in detecting MDD: a comparison between residents in a Thai long-term care home and geriatric outpatients. J Clin Med Res. 2013 5(2): 101-11

27 Institute of Geriatric Medicine. Cognitive function tests Thai Version: MMSE-Thai 2002. Nonthaburi: Institute of Geriatric Medicine; 2001.

28 Nasreddine ZS, Phillips NA, Bedirian V, Charbonneau S, Whitehead V, Collin I, et al. The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. J Am Geriatr Soc. 2005 53(4): 695-9

29 Tangwongchai S, Charernboon T, Phanasathit M, Akkayagorn L, Hemrungrojn S, Phanthumchinda K, Nasreddine ZS. The validity of thai version of the montreal cognitive assessment (MoCA-T). Dement Neuropsychol. 2009 [cited 2018 Oct 10]. Available from https://www.researchgate.net/publication/311715441_The_validity_of_thai_version_of_the_montreal_cognitive_assessment_MoCA-T

30 Streubert HJ, Carpenter DR. Qualitative research in nursing: advancing the humanistic imperative. 5th ed. Philadelphia: Lippincott Williams & Wilkins; 2011.

31 Department of Medicine, Ministry of Health. Guide to screening/evaluating in the older people. 2nd ed. Bangkok: Office of the Veterans Affairs Organization; 2015.

32 Hodkinson HM. Evaluation of a mental test-score for assessment of mental impairment in the older. Age Ageing. 1972 1(4):233-8

33 Srithamrongsawat S., Bundhamcharoen K., Sasat S., Odton P., Ratkjaroenkhajorn S., Projection of Demand and Expenditure for Institutional Long Term Care in Thailand. Bangkok: Health Insurance System Research Office; 2009.

34 Undara W, Singhasenee U, Wongnitikul P. The study of dementia, knowledge and prevention of dementia and the demographic data in the older Association of Royal Thai Air Force Nursing College. Journal of the Police Nurses. 2017 8(1): 23-33

35 Suwan A, Trakulsithichoke S. Prevalence and factors associated with dementia among older in Lukhok Subdistrict, Muang District, Pathumtani Province. APHEIT Journal. 2016 5(2): 21-32

36 Churaitatsanee, S. Reflection on lesson learned from the group support in family caregiver of Dementia patients. Thai Journal of Nursing. 2014 63(4): 5 -11

การพัฒนาบริการการดูแลผู้สูงอายุภาวะสมองเสื่อมในการดูแลระดับปฐมภูมิแห่งหนึ่ง

บุศรินทร์ หลิมสุนทร วรรณภา ศรีธัญรัตน์ สมพร รุ่งเรืองกลกิจ*

บทคัดย่อ: การวิจัยเชิงปฏิบัติการแบบมีส่วนร่วมเชิงเทคนิค มีวัตถุประสงค์เพื่อพัฒนาบริการดูแลภาวะสมองเสื่อมสำหรับผู้สูงอายุและครอบครัวในการดูแลระดับปฐมภูมิแห่งหนึ่ง เขตภาคกลางของประเทศไทย ผู้ร่วมวิจัย คือ ผู้ให้บริการระดับปฐมภูมิ อาสาสมัครสาธารณสุข ผู้สูงอายุและผู้ดูแล เก็บข้อมูลในเดือน เมษายน 2559 ถึง กุมภาพันธ์ 2560 โดยการสัมภาษณ์เชิงลึก การสนทนากลุ่ม การสังเกต และการศึกษาเอกสาร วิเคราะห์ข้อมูลเชิงคุณภาพ โดยการวิเคราะห์เนื้อหา และวิเคราะห์ข้อมูลเชิงปริมาณโดยใช้สถิติเชิงพรรณนา ผลการศึกษา ระยะที่ 1 การวิเคราะห์สถานการณ์ พบ มีการจัดบริการดูแลภาวะสมองเสื่อมตามความรู้และความเข้าใจในภาวะสมองเสื่อมของผู้ใช้บริการและผู้ให้บริการ ผู้ใช้บริการรับรู้ว่าภาวะสมองเสื่อมเป็นธรรมชาติของความสูงอายุไม่จำเป็นต้องวินิจฉัยและดูแลเฉพาะ และผู้ให้บริการรับรู้ภาวะสมองเสื่อมในระยะรุนแรง จึงส่งต่อไปยังโรงพยาบาลจิตเวช ระยะที่ 2 การพัฒนาบริการดูแลภาวะสมองเสื่อม มีการให้ความรู้และฝึกอบรม อาสาสมัครสาธารณสุข และผู้ให้บริการระดับปฐมภูมิ เรื่องภาวะสมองเสื่อมและการคัดกรอง ผลการคัดกรองผู้สูงอายุ 319 คน มีภาวะสมองเสื่อม 9 คน มีภาวะการรู้คิดบกพร่องเล็กน้อย 3 คน มีการส่งต่อเพื่อวินิจฉัยและรักษา ประสานการดูแลและให้คำปรึกษาตามต้องการ จัดโปรแกรมพัฒนาศักยภาพสมอง และบริการดูแลที่บ้าน โดยพยาบาล ระยะที่ 3 การสังเคราะห์ผล การพัฒนาแนวทางการดูแลภาวะสมองเสื่อมในการดูแลระดับปฐมภูมิ เสนอว่าควรมี 6 กิจกรรม คือ 1) การสร้างความตระหนักและสร้างศักยภาพแก่ ผู้ให้บริการและผู้ใช้บริการ 2) การคัดกรองภาวะสมองเสื่อม 3) การส่งต่อเพื่อวินิจฉัยและรักษา 4) การประสาน/ให้คำปรึกษา 5) การฝึกสมรรถภาพสมอง และ 6) การดูแลที่บ้าน พยาบาลควรได้รับความรู้และฝึกอบรมเพื่อการจัดบริการตามแนวทางการดูแลภาวะสมองเสื่อมในการดูแลระดับปฐมภูมิ

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Effects of School–Based Participation Program to Prevent Multiple Risk Behaviors in Thai Male Adolescents

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Abstract: The onset of multiple risk behaviors, such as smoking, alcohol consumption and unprotected sexual intercourse, cluster in adolescence. Previously, many studies on adolescent risk factors have highlighted only a single risk behavior without considering the importance of the mutual relationships among them. Adolescents who engage in any one risk behavior are likely to engage in others. This quasi-experimental study aimed to examine the effects of a School-based Participation Program to prevent multiple risk behaviors in male students. Two secondary schools in suburban areas of Bangkok were randomly selected for this study, one designated the experimental and the other the comparison school. The sample included 64 male students (32 from each school). Additionally, 17 parents participated in the study. Data were collected by a self-administered questionnaire that included the following instruments: Demographic data, Knowledge of Risk Behaviors Prevention, Attitude towards Multiple Risk Behaviors, Self-efficacy to Avoid Multiple Risk Behaviors, Emotional Intelligence, and Time Management, Parental Monitoring and Multiple Risk Behaviors. The independent t-test and repeated one-way analysis of variance were used to analyze the data.

Results revealed that most of the experimental and comparison groups smoked cigarettes. The experimental group had significantly higher mean scores of knowledge, attitude, self-efficacy, emotional intelligence, time management, and parental monitoring at baseline, immediately following, and nine weeks after intervention, all better than those in the comparison group across all time points of measurements. Compared to the comparison group, the experimental group did better regarding not having multiple risk behaviors across time. Nurses could apply this program to train adolescents to prevent multiple risk behaviors and the involvement of parents could strengthen the sustainability of risk behavior prevention in adolescents. However, the program requires further research with different populations.

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Keywords: Adolescents, Male Students, Multiple Risk Behaviors, Participation, School-Based program

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Introduction

According to recent research,[1-2] the prevalence of multiple risk behaviors (MRB), or the co–occurrence of practices such as smoking, alcohol use, and risky sexual behaviors, has increased among Thai male

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adolescents. About 7.8% of adolescent›s smoke[3]and 13.6% drink alcohol on a regular basis.[4] Also, the prevalence of sexual risk behavior among adolescents has increased. Births among Thai adolescents 15 to 19 years old is higher than the average for Asia and the Pacific, although the number of such births decreased from 53.4 in 2011to 44.8 per 1000 population in 2015.[5] Adolescents engaging in these risky behaviors may have subsequent adverse outcomes such as accidents, sexually transmitted infections (STIs), unwanted pregnancy, and school dropout.[6]Although these behaviors have been taken into account for risk behavior prevention among adolescents, previous studies mostly focused on single risk behavior and at the individual level.[7]A systematic review of effective interventions for reducing multiple health risk behaviors in adolescents indicated that school-based and integrated prevention programs are feasible and effective.[8] In addition, parental and community involvement were positively associated with effective changes in adolescents' health behaviors.[9] However, most of the studies were conducted in the United States. None focused on MRB of adolescents in Thailand. Therefore, we believed that development of an intervention program was needed in the Thai context, aimed at preventing multiple risk behaviors during adolescence by integrating actions to reduce risk behaviors and involving the participation of all parties (male students, parents, and teachers).

Literature Review

Bronfenbrenner's ecological model was used to frame the contextual factors associated with MRB in adolescents.[10] This model managed by different systems, that is microsystems, mesosystems, exosystems and exo or macrosystems, where different levels are affected differently within each system level.[11] The first and the most basic level is related to the roles, activity patterns and relationships of the individual, named as the microsystem or interactional level. This microsystem level involves activity patterns, roles and interpersonal relations faced in that environment such as knowledge, with primary psychological variables including attitude, self-efficacy, and emotional intelligence. The mesosystem involves interactions among settings with relevant variables including parental monitoring and time management. Parents and schools are key influencing factors and the core sources for adolescents' social support.

From an ecological perspective, adolescent development and engagement in risk behaviors are influenced by factors through multiple levels including the individual, family, school, and environmental level.[10] From a resilience perspective, these factors are related to a higher likelihood of engaging and increasing risky behaviors, whereas other factors such as individual assets and contextual resources which are protective, operate to enhance healthy development and may reduce the adverse effects addressed by risk factors. A study by Wongtongkam et al. found three cultural factors influencing Thai male adolescents' behaviors: 1) individual factors including knowledge of risk behaviors prevention, attitude toward multiple risk behaviors, self-efficacy to avoid various risk behaviors, emotional intelligence, and time management; 2) family factors including parental monitoring and family relationship; and 3) environmental factors including friend motivation and school atmosphere.[12] These protective factors are necessary to prevent multiple lifestyle behaviors. A preventive intervention program should address the risks posed at the individual level, as well as contextual risk factors. Cooperation from several sectors is required to attempt to jointly prevent multiple risk behaviors of adolescents, and this includes individual, family, and community levels. This cooperation is consistent with a participatory approach, that is a process by which people are enabled to become actively and genuinely involved in defining the issues of concern to them, in decision-making about factors that affect their lives, in formulating and implementing the activities, in planning, developing and delivering services and in taking action to achieve change.[13] The advantages of this approach include taking into account the needs and lifestyle of key participants, the context of the problem, and culturally appropriate factors related to the problems of risk-taking. This approach could fill the gap in earlier studies by promoting the involvement of all parties.

Common to many behavioral theories is the idea that behavior is influenced by an individual's learning ability and the values and beliefs that transfer from a source of information to target groups. The hierarchical nature of the interaction between male adolescents, parents, and teachers allow reliable communication about sexual issues in ways they have. Our program was based on the Self-Efficacy Theory of Bandura[14] and specific social and cultural relevance.

Additionally, previous studies examining the effectiveness of prevention interventions for adolescent risk behaviors have some limitations. First, most studies only focus on intervening in one risk behavior.[7] Adolescents who already engage in one risky behavior are at risk for engaging in multiple risk behaviors. For example, adolescents who smoke cigarettes and drink alcohol are more likely to participate in risky sexual behavior.[15] Furthermore, previous studies suggest that these risk behaviors tend to co-occur during adolescence.[16] Accordingly, increasing the risk of adverse outcomes is associated with each additional risk factor, resulting in the MRB pattern. Second, most intervention studies have not included adolescents' perspectives. Therefore, development of an intervention program must aim at preventing multiple risk behaviors during adolescence by integrating actions to reduce behaviors and involve the participation of key parties.

Study Aim

This quasi-experimental study aimed to examine the effects of the SBPP to prevent multiple risk behaviors in male students in Thai secondary schools. The following hypotheses were set: The mean scores of knowledge, attitude, self-efficacy, emotional intelligence, parental monitoring in the experimental group would be significantly higher whereas the number of multiple risk behaviors would be significantly lower than those in the comparison group immediately after and one month after attending the program.

Methods

Design

This study used a two-group, pre- and post-test, quasi-experimental design.

Sample and Setting

Two out of ten secondary schools located on suburban areas of Bangkok were randomly selected. They had high tentative risks behavior as per school reports. were randomly selected. After that, simple random sampling was executed to designate one as the intervention school and the other as the comparison school. The participants in each school were eligible for the study based on the following criteria: 1) aged 13-15 years; 2) had engaged in cigarette smoking because it is a gateway for misconduct behaviors, and popular in Thai adolescents, and 3) were willing to participate in the study by providing their consent and their parents/guardians› approval. Of the 32 parents, 17 agreed to participate in the program. Fifteen parents declined to take part in the study; the main reason given was not enough time to join due to their regular jobs.

Since a small effect size was anticipated, the sample size was raised using a power of 80% and 0.20 SD differences in outcomes between the intervention and comparison groups with 95% confidence interval.[17] Twenty-five persons were in each group. The sample size was increased by 10% (3 persons) to cover attrition. A total of 63 male students (32 in the intervention and 31 in the comparison group) participated. Each participant in the intervention school identified the parent that they felt closest to and that parent was invited to participate in the program.

Ethical Considerations

The Institutional Review Board of Faculty of Public Health, Mahidol University approved this research (COA. No. MUPH 2016-079). Consents and agreements were obtained from parents and their children, with permission from school authorities. The potential participants were informed about study objectives, program processes, confidentiality, risks, benefits, and their rights. They were able to ask questions and withdraw from the study at any time.

Intervention

The primary investigator (PI) developed the SBPP from 11 focus groups, seven in-depth interviews, and a literature review. The SBPP was reviewed and validated by three experts: a child and adolescent nursing instructor, a pediatric nursing instructor, and a physician from Queen Sirikit National Institute of Child Health. Activities took place July-October 2017 and the SBPP was composed of eight sessions, one-hour long, over nine weeks. The sessions focused on knowledge related to life skills to prevent multiple risk behaviors, condom use, contraceptive pills, and the consequence of various risk behaviors, attitudes towards MRB, time and stress management, and self-discipline skills for adolescents' risk behavior modification based on self-efficacy theory. Two sessions for both the participants and their parents/guardians focused on child rearing, parental monitoring, and family communication. Such activities can help parents sustainably develop their parenting skills which might in turn resulting in children's multiple risk behavior prevention. The SBPP and activities are described in Table 1. The comparison group received the one-hour education program and booklet after finishing the follow-up period.

Table 1 Details of program to prevent multiple risk behaviors

Week/Sessions	Learning objectives	Procedure

Week 1:
Jigsaw of Knowledge about Risk Behavior Prevention
	Provide information on risk behaviors prevention	**Male students:**
		• Learn about risk behaviors prevention by jigsaw process (50 mins.)
		  • Increase understanding on life skill, contraception, and consequence of risk behaviors
		  • Practice how to use a condom
		• Game Quiz (10 min)

Week 1: Attitude Change	Changing attitudes towards multiple risk behaviors	**Male students:** • Identify feelings towards multiple risk behaviors (smoking, alcohol drinking, and sexual risk behavior) (10 min) • Increase awareness and attitudes regarding risk behaviors by explaining about the risk behaviors situation of Thai male adolescents (15 min) • Change feelings using a case study clips of those affected by various risk behaviors (10 min) • Discuss and analyze the impact on those affected by various risk behaviors in case study (25 min)

Table 1 Details of program to prevent multiple risk behaviors (cont.)

Week/Sessions	Learning objectives	Procedure
Week 2: Family Matter "Just Say No" Is Only One Way to Go	Increase self-confidence to avoid multiple risk behaviors	**Male students:** • Identify ways to negotiation, how to avoid the risk behaviors when their friend's persuasion (10 min) • Skill practice for negotiation, practiced repeatedly in hypothetical situation and actual classroom along with recording about self-confidence for reflection (40 min) • Discuss about some of the tactics for dealing with peer pressure (10 min)
Week 2: Relieving Stress Techniques	Provide the information about cause of stress Choose strategies for dealing with stressful situations	**Male students:** • Lecture: Increase understanding of stress. Five 5 topics: What is the stress?; Level of stress; Causes of stress in adolescents; Dealing with stress; and Relieving stress techniques (20 min) • Identify ways to release stress • Skill practice to choose the way for dealing with the stress situation by use the scenarios
Week 3: Building the Bridge	Describe the cause of conflict between male adolescents and parents/guardians Demonstrate how to communicate to try to reduce conflict	**Male students:** • Increase understanding the difference of ages and experience between adults and adolescents (10 min) • Group work to identify the cause of conflict between adults and adolescents (30 min) • Discuss the ways how to communicate and reduce the conflict between adults and adolescents (20 min)
Week 3: Life Schedule	To improve time management skills to own benefit	**Male students:** • Increase understanding of the importance of time management (5 min) • Group discussion to exchange experiences about their leisure time (10 min) • Provide the information about Effective Time Management Principles (15 min) • Skill training about scheduling life and time management to own benefit in one week (30 min)
Week 3: Family Matter "The Rules of the House"	Set family rules and regulations about multiple risk behaviors such as smoking, alcohol drinking, and sexual risk behavior	**Male students:** • Define their roles to prevent multiple risk behaviors (15 min) • Brainstorm to identify the family regulation and discuss this between students and parents/guardians groups (25 min) **Parents/guardians:** • Define parent roles to prevent multiple risk behaviors (15 min) • Brainstorm to identify family regulation (25 min)

Table 1 Details of program to prevent multiple risk behaviors (cont.)

Week/Sessions	Learning objectives	Procedure
		Both male students and parents/guardians: • Discuss family regulations between students and parents/guardians group (20 min)
Week 3: Family Rules About Alcohol and Tobacco	Set clear family rules and regulations for male student about smoking/alcohol drinking behavior	**Male students:** • Discuss about each rule, and listen to parents' questions and concerns (10 min) • Brainstorm to decide on rewards for following the rules and the consequences for breaking these (20 min) **Parents/guardians:** • Discuss about each rules, and listen to student's questions and concerns (10 min) • Brainstorm to decide on rewards for following the rules and consequences for breaking them (20 min) **Both male students and parents/guardians:** • Parents/guardians discuss with students about rewards for following rules and consequences for breaking them (30 min)

Instruments

The instruments used in this study are available in the public domain. The original measures are in English, and were back-translated by two researchers who were competent in both Thai and English. No major semantic differences are found between the sources and the back translations. After that all of the instruments were piloted for face validity in a group of six male adolescents to check understandability and cultural appropriateness in Thai. The eight parts of self-reported questionnaire was used for data collection in both experimental and comparison groups. The content validity index and reliability in both the pilot and actual study of each instrument are shown in Table 2.

Table 2 Validity and reliability of the measures in this study

Measures	Content Validity Index (CVI)	Reliability	
		Pilot study	Actual study
1. Knowledge of risk behaviors prevention	.80	.69[a]	.72[a]
2. Attitude towards multiple risk behaviors	.80	.61[b]	.68[b]
3. Self-efficacy to avoid multiple risk behaviors	.80	.79[b]	.82[b]
4. Emotional intelligence	.80	.68[b]	.70[b]
5. Time management	.80	.68[b]	.72[b]
6. Parental monitoring	.80	.70[b]	.72[b]
7. Multiple risk behaviors	.80	.70[b]	.74[b]

[a] KR-20

[b]= Cronbach's Alpha

The Demographic questionnaire includes age, study level, grade, living arrangement, money allowance, parental marital status, and family relationship.

Knowledge of Risk Behaviors Prevention. This is a standardized questionnaire developed by the Health Education Division, Ministry of Public Health.[18] Questions refer to risk behavior prevention including life skills to prevent multiple risk behaviors, contraception, and consequence of various risk behaviors. An item example is "Which skill is the most important for MRB prevention?" Knowledge is assessed using 15 true/false items (1 = correct, 0 = false). A higher score indicates a higher level of knowledge

Attitude towards Multiple Risk Behaviors. This includes questions from a standardized survey of the Health Sponsorship Council,[19] 15 items regarding a student's feelings towards various risk behaviors. An item example is "Smoking, drinking alcohol, and having sex reflect my adulthood." Participants are asked to rate on a 4-point rating scale from 1 (strongly disagree) to 4 (strongly agree). The range of scores is 15-60, with higher scores indicating a higher negative attitude towards multiple risk behaviors

Self-efficacy to Avoid Multiple Risk Behaviors. This measure has 15 items from a standardized self-efficacy instrument developed by Schwarzer.[20] It consists of 15 items regarding male adolescents' confidence to say no to a friend's persuasion. They have to indicate their ability on a 5-point Likert scale from 1 (no confidence) to 4 (highly confident). An item example is "You would be able to say NO to drinking alcohol when your friends motivate you to drinking a party". Total scores range from 15-60, with higher scores indicating better perceived self-efficacy to avoid multiple risk behaviors.

Emotional Intelligence. This measure includes questions from the standard Emotional Quotient (EQ) instrument developed by the Department of Mental Health, Ministry of Public Health.[21] It consists of 12 items regarding emotional intelligence and rating is done on a 4-point scale from 1 (Not true) to 4 (Very true). An item example is "I tried to examine root causes of my emotional problems rather than making things up". The range of scores is 12-48, with higher scores indicating better emotional control.

Time Management. This has standardized assessment questions and was developed by Bond & Feather.[22] It has 15 items regarding male students› ability to organize, plan, and manage their free time using a 4-point scale from 1 (Yes, Always) to 4 (No, Never). An item example is "Do you ever feel that the things you have to do during the day just don›t seem to matter? The range of scores is 15-60, with higher scores indicating better time management.

Parental Monitoring. This measure was developed by Small & Kerns[23], and Hayes, Hudson & Matthews[24] consisting of 15 items with 4 using a factorial scale and 11 rated items on a 3-point scale from 1 (Practically never) to 3 (Almost all the time). An item example is "How often do your parent(s) know where you are after school?" The scores range from 15-45, with higher scores indicate better parental monitoring.

Multiple Risk Behaviors. This measure was derived from the CDC Youth Risk Behavior Survey[11] consisting of 23 items with a factorial scale. The items assess male students› risk behaviors (for example, smoking, alcohol drinking, and sexual behavior). An item example is "Have you ever had sexual intercourse?" Lower scores indicated fewer risk behaviors.

Data Collection

The experimental and comparison groups answered questionnaires including knowledge, attitude, self-efficacy, emotional intelligence, time management, and parental monitoring at the beginning, immediately after the program (week 3), and during the follow-up period (week 9). Furthermore, at the beginning and during the follow-up period (week 9), the participants answered questions about multiple risk behaviors.

Data Analysis

All analyses were conducted using the statistical software package (SPSS program version 18) and presented by percentage, mean, standard deviation, independent t-test, and repeated measures analyses of variance with post-hoc Bonferroni. Significance tests used a probability of $\alpha = .05$.

Results

Participants in both student groups were early adolescents from 13-15 years old.

The average age of the experimental and comparison group were 13.9 and 14.7 years, respectively. Although the comparison group was slightly older than those in the experimental group, the age did not significantly differ. The majority of both groups were studying in grade 8 (62.5% and 61.3% respectively). Most participants in both groups lived with both father and mother (87.5% and 83.8% respectively). Approximately (50.0%) of the experimental group had a daily expense of more than 100 baht ($US3), whereas 71.0% of the comparison group had 51 to 100 baht (around $US1.5-$3) per day. Sociodemographic characteristics between the experimental and comparison groups did not differ (Table 3).

Table 3 Comparison of Demographics and Male Student Characteristics in Intervention and Comparison Groups (n = 63)

Characteristics	Intervention group (n = 32)	Comparison group (n = 31)	*p*-value
	n (%)	n (%)	
Age (years)			
13	10 (31.3)	0 (0.0)	
14	13 (40.6)	10 (32.3)	
15	9 (28.1)	21 (67.7)	
Mean ± S.D.	13.97 ± 0.78	14.68 ± 0.47	.071[a]
Educational level			
8	20 (62.5)	19 (61.3)	
9	12 (37.5)	12 (38.7)	.921[b]
People who reside with student			
Both father and mother	28 (87.5)	26 (83.8)	
Only father or only mother	3 (9.4)	2 (6.5)	
Cousins/other relatives	1 (3.1)	3 (9.7)	.533[b]
Parental status			
Living together	27 (84.4)	24 (77.4)	
Separated or divorced	4 (12.5)	2 (6.5)	
One or both have died	1 (3.1)	5 (16.1)	.174[b]
Daily expenses (Baht/USD)			
0 – 50 (< $1.5)	3 (9.4)	2 (6.5)	
51 – 100 ($1.5-$3.0)	13 (40.6)	22 (71.0)	
> 100 (>$3.0)	16 (50.0)	7 (22.5)	
Min- Max	50 - 200	50 - 150	
Mean ± S.D.	113.44 ± 32.98	100.65 ± 24.07	.083[a]

[a] = t-test; [b] = c^2

Results of hypothesis testing

Perceived self-efficacy to avoid multiple risk behaviors, emotional intelligence, time management, and parental monitoring between the two groups were not different at baseline (p>.05).There were two studied variables significantly different at baseline (p<.05) including knowledge of and attitude towards risk behaviors prevention. The pretest score of these two variables were taken into account by two-factor design repeated measure analysis.

Knowledge and attitude towards risk behavior prevention, self-efficacy, emotional intelligence, time management, and parental monitoring

There was statistically significance difference in participants' knowledge and attitude towards risk behavior prevention, self-efficacy, emotional intelligence, time management, and parental monitoring across three time periods between the two groups (Table 4). In addition, there was a statistically significant effect of time on participants' knowledge and attitude towards risk behavior prevention, self-efficacy, emotional intelligence, time management, and parental monitoring within subjects, and the interaction effect between time points and the groups in within-subjects, p < .01 (Table 4).

In addition, there were statistically significant differences in participants' knowledge and attitude towards risk behavior prevention, self-efficacy, emotional intelligence, time management, and parental monitoring scores measured immediately after and one month after attending the program between the experimental and comparison groups, p < .01 (Table 5). Furthermore, we also found that the mean differences of participants' knowledge and attitude towards risk behavior prevention, self-efficacy, emotional intelligence, time management, and parental monitoring between both groups measured at one month were larger than that immediately after program (Table 5).

Table 4 Two-Factor Design Repeated Measures Analysis for Studies Variables

Source	SS	*df*	MS	F	*p*-value
Knowledge on risk behaviors prevention					
Between subjects					
Group	29.28	1	29.28	5.25	.025
Error	339.67	61	5.568		
Within subjects					
Time	348.59	1.77	196.40	108.40	<.001
Time*group	108.95	1.77	61.38	33.88	<.001
Error (Time)	196.15	108.26	1.81		
Attitude towards multiple risk behaviors					
Between subjects					
Group	1188.58	1	1188.58	64.78	<.001
Error	1119.22	61	18.34		
Within subjects					
Time	1455.99	1.35	1073.14	86.06	<.001
Time*group	1369.81	1.35	1009.62	80.97	<.001
Error (Time)	1031.96	82.76	12.46		
Knowledge on risk behaviors prevention					
Between subjects					
Group	29.28	1	29.28	5.25	.025
Error	339.67	61	5.568		

Table 4 Two-Factor Design Repeated Measures Analysis for Studied Variables (Cont.)

Source	SS	*df*	MS	F	*p*-value
Within subjects					
Time	348.59	1.77	196.40	108.40	<.001
Time*group	108.95	1.77	61.38	33.88	<.001
Error (Time)	196.15	108.26	1.81		
Attitude towards multiple risk behaviors					
Between subjects					
Group	1188.58	1	1188.58	64.78	<.001
Error	1119.22	61	18.34		
Within subjects					
Time	1455.99	1.35	1073.14	86.06	<.001
Time*group	1369.81	1.35	1009.62	80.97	<.001
Error (Time)	1031.96	82.76	12.46		
Self-efficacy to avoid multiple risk behaviors					
Between subjects					
Group	1129.15	1	1129.15	76.76	<.001
Error	897.32	61	14.71		
Within subjects					
Time	1611.48	2	805.74	121.29	<.001
Time*group	598.40	2	299.20	45.04	<.001
Error (Time)	810.42	122	6.64		
Emotional intelligence					
Between subjects					
Group	479.03	1	479.03	36.73	<.001
Error	795.53	61	13.04		
Within subjects					
Time	145.37	1.34	108.09	11.94	<.001
Time*group	372.59	1.34	277.03	30.60	<.001
Error (Time)	742.61	82.04	9.05		
Time management					
Between subjects					
Group	607.23	1	607.23	33.46	<.001
Error	1106.90	61	18.14		
Within subjects					
Time	161.44	2	80.72	27.46	<.001
Time*group	136.96	2	68.48	23.30	<.001
Error (Time)	358.52	122	2.939		

Table 5 Multiple comparisons of mean differences of studied variables across three time points of measurements between the experimental and comparison groups

Groups Variables	Intervention group (n = 32)		Comparison group (n = 31)		Mean difference	*p*-value (two-tailed)
	$\bar{X}$	SD	$\bar{X}$	SD		
Knowledge on risk behaviors prevention						
Before	5.94	2.27	7.29	1.75	-1.35	.011
After	10.28	1.67	8.58	1.62	1.70	<.001
Follow-up	10.56	1.58	8.55	1.15	2.01	<.001
Attitude towards multiple risk behaviors						
Before	31.56	5.06	34.16	4.18	-2.60	.030
After	42.06	2.62	33.32	2.46	8.74	<.001
Follow-up	43.88	2.72	34.97	2.61	8.91	<.001
Self-efficacy to avoid multiple risk behaviors						
Before	26.25	2.97	26.39	2.66	-0.14	.848
After	33.78	3.69	26.61	3.12	7.17	<.001
Follow-up	37.28	3.08	29.65	2.64	7.63	<.001
Emotional intelligence						
Before	22.41	4.69	23.19	3.87	-0.78	.472
After	27.03	1.87	21.87	1.92	5.16	<.001
Follow-up	27.41	1.82	22.23	1.62	5.18	<.001
Time management						
Before	27.91	4.99	27.71	4.57	0.20	.871
After	31.13	2.57	26.65	2.67	4.48	<.001
Follow-up	33.53	2.11	27.45	2.29	6.08	<.001
Parental monitoring						
Before	16.63	2.31	16.55	2.11	0.08	.891
After	19.69	1.82	16.06	1.71	3.63	<.001
Follow-up	20.72	1.80	16.97	1.58	3.75	<.001

Multiple risk behaviors

Findings showed that before the experiment, all participants of both groups had experienced cigarette smoking. Immediately after completing the program and in follow-up period, the experimental group reported only one risk behavior as smoking, and therefore did not engage in multiple risk behaviors. Furthermore, intervention group participants tried to quit using all tobacco products more than the comparison group (28.1% and 3.2%, respectively). On the other hand, one participant in the comparison group reported engaging in two risk behaviors, smoking and alcohol drinking.

Discussion

Our findings indicated that the School-based Participation Program had beneficial effects on knowledge and attitude towards multiple risk behaviors, emotional intelligence, time management, and parental monitoring. This program improved understanding, feeling, and skills to prevent MRB through cooperative learning and the consequence of responsible action through instructional tasks. Attending group participation influenced negative feelings toward MRB from existing experiences via video clips from real situations of those who had engaged in various types of risk behaviors. Participants in the intervention group became critically informed of risk behavior situations arising from their friends› lived experiences and hypothetical situations. This course increased their fears and raised their awareness of the consequence of multiple risk behaviors. Repeatedly practices in a hypothetical situation and actual classroom could enhance confidence to become competent in negotiation skill and have more self-reliance to avoid risk behaviors.[25] Thus, when participants face with stressful life events, they could cope without performing risk behaviors. Scheduling their daily life and time management techniques helped them manage their free time and encouraged collaboration between participants and their parents to think about the family rules, as well as to commit with all participants to follow the rules. This result was in accordance with the study of Wongtongkam et al.[26] Family is the basic unit of Thai society; parent rearing shapes attitudes, habits, and personality through the interaction between family members. Our findings are also consistent with a previous study[27] in risk behaviors prevention in adolescents. We recommend that parental involvement should be included to raise program effectiveness. This activity in our study assisted parents in controlling and monitoring their children's behaviours. In turn participants perceived higher levels of parental monitoring. In addition, we also found this was consistent with results from a meta-analysis of Meader et al.[28] regarding multiple risk behavior prevention. Interventions comprising education (e.g. providing information about behaviors associated with health risks) and skills training (e.g. teaching skills that equip adolescents to engage in less risky behavior) and targeting multiple risk behaviors concurrently are associated with reducing smoking behavior. However, there is one difference between our study and that of Meader et al.[28], the reduction of multiple risk behaviors. Although on average smoking was reduced, it appeared changes in smoking were negatively associated with changes in other behaviors.[28] This suggested that it may not be optimal to target smoking simultaneously with other risk behaviors. In our study, after attending SBPP, the participants tried to quit smoking and did not report engaging in other risky behaviors. This might due to summarizing essential messages from the activity and group discussion could enhance their knowledge and ability to prevent multiple risk behaviors. In addition, the participants› needs (male students, parents, and teachers) were considered in formulating the SBPP to promote their understanding, confidence, and ability to prevent MRB. A culturally prepared and systematic approach for intervention development[29] makes the SBPP different from previous programs which then results in strengthening adolescents' MRB preventive behaviors.

This program goes beyond the limit number of multiple risk behaviors prevention in the formal curriculum for secondary school students. The implementation of the MRB prevention program in the secondary schools is of special concern. We found that participants and their parents showed interest for programs that help prevent multiple risk behaviors. Additionally, male student-family-school bonding can be advanced by developing social skills, improving school climate, and encouraging authoritative parenting practices. This is concordance with the study of Mirzazadeh et al.[30] which found that male students are motivated by an authoritative teaching style that is demanding, supportive and fair. In Thailand, there is an urgent need to implement programs like SBPP because most adolescents spend time in the school. The SBPP could prevent male students from engaging in MRB. This program could be utilized with other male students who seek to strengthen their proficiency to improve knowledge related to MRB prevention, develop negative attitude towards MRB, self-efficacy to avoid MRB, emotional intelligence, time management, and parental monitoring.

Limitations

Although this study was conducted based on the factors related to risk-taking behaviors of Thai male students with their parents' involvement at one secondary school in urban areas, it might not be generalizable to other male students because of different school contexts. Only 17 parents could participate in this program because of time conflicts and this may have effected results regarding adolescent learning behaviors about risk. In addition, following up participants for only one month follow up might not result in the sustaining of newly learnt behaviors to avoid risk taking.

Conclusions and Implications for Nursing Practice

The findings of this study revealed the effectiveness of MRB prevention intervention for male students in the secondary school. Multiple risk behaviors prevention for male students is improved by the participants' needs which include male students, and parents, as well as focusing on school-based intervention. Three significant concerns are vital for nursing implications. Firstly, the SBPP can be implemented with the secondary school students in other schools. In addition, parental involvement should be promoted in order to sustain the adolescents' preventive behaviors. Program content should be flexible for emerging disruptive changes related to social needs. Secondly, the activities in the program start at a basic level and move forward to more sophisticated skills. Therefore, the effects of this intervention, if maintained over time, may lead to strengthening risk behavior prevention skills. Risk avoidance behaviors need to be followed up at longer time periods in order to maintain the program effectiveness. Finally, further research should be conducted in other schools to test program efficacy.

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References

1. Thiraphattarapun V, Powwattana A, Auemaneekul N. Association Between Multiple Risk Behaviors and Life Assets of High School and Vocational Students. Journal of Public Health Nursing. 2017; 31(3): 1-17.[in Thai].
2. Duangkaew K, Powwattana A, Auemaneekul N. Factors Related To Multiple Risk Behaviors among Vocational Students in Bangkok. Journal of Public Health Nursing. 2017; 31(special edition): 75-95.[in Thai].
3. Tobacco Control Research and Knowledge Management Center. Report on Statistics on Smoking Consumption in Thailand 2018. C2018 [cited 2018 May 1]. Available from http://www.trc.or.th/th/images/upload/files/data/tobaccoinfo/situation/2561/situation_2018.pdf.
4. National Statistical Office. Report on Statistics on Alcohol Consumption in Thailand 2017. C2018 [cited 2018 Febuary 14]. Available from http://www.nso.go.th/sites/2014/Pages/News/2561/N30-08-61-2.aspx
5. Bureau of Reproductive health, Department of Health, Ministry of Public Health. Statistics on Adolescent Births, Thailand 2015. C2016 [cited 2018 December 21]. Available from http://rh.anamai.moph.go.th/ewt_dl_link.php?nid=147
6. Phuhongtong M, Homchampa P, Sirithanawuttichai T. Sexual risk behaviors among early adolescents currently studying at primary schools in Thailand. Suranaree J. Sci. Technol. 2018; 25(1):115-24. [in Thai].
7. Caroline A, Jackson EA. An overview of prevention of multiple risk behaviors in adolescence and young adulthood. J Public Health. 2015;34(1):31-40.
8. Hale DR, Fitzgerald-Yau N, Viner RM. (2014). A systematic review of effective interventions for reducing multiple health risk Behaviors in adolescence. Am J Public Health. 2014; 104(5):19-41.

9. Busch V, De Leeuw JR, De Harder A, Schrijvers AJ. Changing multiple adolescent health behaviors through school-based interventions: a review of the literature. J Sch Health. 2013; 83(7):514-23. https://doi.org/ 10.1111/josh.12060.
10. Bronfenbrenner U. Ecology of human development: Experiments by nature and design. Cambridge, MA: Harvard University Press; 1979.
11. Centers for Disease Control and Prevention. 2017 State and local youth risk behavior survey. 2017 [cited 2017 March 1]. Available from https://www.cdc.gov/ healthyyouth/data/yrbs/pdf/2017/2017_yrbs_ standard_hs_questionnaire.pdf
12. Wongtongkam N, Ward PR, Day A, Winefield AH. The influence of protective and risk factors in individual, peer and school domains on Thai adolescents› alcohol and illicit drug use: A survey. AddictBehav. 2014; 39(10):1447-51.https://doi.org/ 10.1016/j.addbeh.2014.05.026
13. WHO Regional Office for Europe. Community participation in local health and sustainable development: approaches and techniques, European sustainable development and health Series No. 4, EUR/ICP/POLC06 03 05D. Copenhagen: WHO Regional Office for Europe; 2002.
14. Bandura A. Self – efficacy: The exercise of control. New York: W.H. Freeman and company; 1997.
15. Connell CM, Gilreath TD, Hansen NB. A multiprocess latent class analysis of the co-occurrence of substance use and sexual risk behavior among adolescents. J Stud Alcohol. 2015; 70(6):943-51. https://doi.org/10. 15288/jsad.2009.70.943
16. Srivastava A. A study on risk taking behaviour among adolescents and their attachment with parents and peers. The international Journal of Indian Psychology. 2016; 3(4):2349-3429: 61-70.
17. Polit DF, Hungler BP. Nursing research principles and methods. (6th ed.). Philadelphia: J.B.Lippincott Company; 1999.
18. Health Education Division, Ministry of Public Health. Health literacy scale for unwanted pregnancy prevention of Thai female adolescent. C2016 [cited 2017 March 1]. Available fromhttp://www.hed.go.th/linkhed/file/24.
19. Health Sponsorship Council. Some possible survey questions. C2016 [cited 2016 March 10]. Available from http://www.smokefree schools.org.nz/sites/all/files.
20. Schwarzer R, Jerusalem M. Generalized self-efficacy scale. In J. Weinman S. Wright M. Johnston. Measures in health psychology: A user's portfolio. Causal and control beliefs (pp. 35-37). Windsor, UK: NFER-NELSON; 1995.
21. Department of Mental Health, Ministry of Public Health. Emotional quotient (EQ) for adolescent who age between 12 to 17 years old. Nonthaburi: Department of Mental Health; 2000. [in Thai].
22. Bond MJ, Feather NT. Some correlates of structure and purpose in the use of time. J Pers Soc Psychol. 1988; 55:321-29.
23. Small SA, Kerns D. Unwanted sexual activity among peers during early and middle adolescence: incidence and risk factors. J Marriage Fam. 1993; 55(4):941-52.
24. Hayes L, Hudson A, Matthews J. A process model of parental monitoring. Presented at the 3rd International conference on child and adolescent mental health, Brisbane, Australia; 2002.
25. Mitchell CM, Kaufman CE, Whitesell NR, Beals J, Keane EM. Self-efficacy about sexual risk/protective behaviors: intervention impact trajectories among American Indian youth. J Res Adolesc. 2017; 27(3):697-704. https:// doi.org/10.1111/jora.12308
26. Wongtongkam N, Ward PR, Day A, Winefield AH. Exploring family and community involvement to protect Thai youths from alcohol and illegal drug abuse. J Addict Dis. 2015; 34(1):112-21. https://doi.org/10.1080/10550887 .2014.975616
27. Allen ML, Garcia-Huidobro D, Porta C, Curran D, Patel R, Miller J, et al. Effective parenting interventions to reduce youth substance use: a systematic review. Pediatrics. 2016; 138(2):1-19.
28. Meader N, King K, Wright K, Graham HM, Petticrew M, Power C, et al. Multiple risk behavior interventions: Meta-analyses of RCTs. Am J Prev Med. 2017; 53(1):19-30.
29. Hoekstra BA, Young VL, Eley CV, Hawking MK, McNulty CA. School nurses' perspectives on the role of the school nurse in health education and health promotion in England: a qualitative study. BMC Nursing. 2016; 15(1):1-9. https://doi.org/10.1186/s12912-016-0194-y
30. Mirzazadeh A, Biggs MA, Viitanen A, Horvath H, Wang LY, Dunville R, et al. Do school-based programs prevent HIV and other sexually transmitted infections in adolescents? a systematic review and meta-analysis. Prev Sci. 2018; 19(4):490-506. https://doi.org/10.1007/s11121-017-0830-0

ผลของโปรแกรมการมีส่วนร่วมของโรงเรียนในการป้องกันพหุพฤติกรรมเสี่ยงในนักเรียนวัยรุ่นชาย

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บทคัดย่อ: พหุพฤติกรรมเสี่ยง คือ การสูบบุหรี่ ดื่มสุรา และการมีเพศสัมพันธ์ไม่ปลอดภัย เป็นปัญหาที่สำคัญและเกิดขึ้นในช่วงวัยรุ่น การศึกษาที่ผ่านมาส่วนใหญ่เน้นที่การแก้ไขปัญหาเพียงพฤติกรรมใดพฤติกรรมหนึ่ง ขาดการให้ความสำคัญกับพหุพฤติกรรมการวิจัยกึ่งทดลองนี้มีวัตถุประสงค์เพื่อประเมินประสิทธิผลของโปรแกรมการการมีส่วนร่วมโดยใช้โรงเรียนเป็นฐานเพื่อป้องกันพหุพฤติกรรมเสี่ยงในนักเรียนชาย ผู้วิจัยทำการสุ่มเลือกโรงเรียนมัธยมศึกษาที่ตั้งอยู่ในเขตชานเมืองกรุงเทพมหานคร จำนวน 2 โรงเรียน และกำหนดให้โรงเรียนแห่งหนึ่งเป็นกลุ่มทดลอง และโรงเรียนที่เหลือเป็นกลุ่มเปรียบเทียบ จากนั้นผู้วิจัยทำการคัดเลือกนักเรียนชายเข้าร่วมการศึกษากลุ่มละ 32 คน รวมทั้งสิ้น 64 คน โปรแกรมการมีส่วนร่วมโดยใช้โรงเรียนเป็นฐานใช้ระยะเวลาทั้งสิ้น 9 สัปดาห์ ประกอบด้วย 12 หน่วยการเรียนรู้ ในระยะ 3 สัปดาห์แรกนักเรียนชายเข้าร่วม จำนวน 10 หน่วยการเรียนรู้ และผู้ปกครองที่นักเรียนสนิทใกล้ชิดเข้าร่วมจำนวน 4 หน่วยการเรียนรู้ และมีสองหน่วยการเรียนรู้ที่มีทั้งนักเรียนชายและผู้ปกครองเข้าร่วมกิจกรรมพร้อมกัน ทำการเก็บรวบรวมข้อมูลด้วยแบบสอบถามชนิดตอบด้วยตนเอง วิเคราะห์ข้อมูลด้วยสถิติค่าทีและการวิเคราะห์ความแปรปรวนแบบทางเดียวเมื่อมีการวัดซ้ำ

ภายหลังการทดลอง พบว่า กลุ่มตัวอย่างส่วนใหญ่สูบบุหรี่ กลุ่มทดลองมีคะแนนเฉลี่ยความรู้ ทัศนคติ การรับรู้ความสามารถของตนเอง ความฉลาดทางอารมณ์ การบริหารจัดการเวลา และการควบคุมกำกับของพ่อแม่ ดีขึ้นกว่าก่อนการทดลอง และดีกว่ากลุ่มเปรียบเทียบอย่างมีนัยสำคัญทางสถิติ นอกจากนี้นักเรียนชายกลุ่มทดลองยังสามารถป้องกันตนเองจากการมีพหุพฤติกรรมเสี่ยงได้ด้วย ผลการศึกษาแสดงให้เห็นว่าโปรแกรมการมีส่วนร่วมโดยใช้โรงเรียนเป็นฐานสามารถป้องกันพหุพฤติกรรมเสี่ยงในนักเรียนชายได้นอกจากนั้นแล้วการมีส่วนร่วมของครอบครัวยังช่วยเพิ่มความคงอยู่ของการป้องกันการมีพหุพฤติกรรมเสี่ยงในวัยรุ่นชาย

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Development and Psychometric Testing of the Gerontological Nursing Clinical Reasoning Scale

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Abstract: The assessing and evaluating of quality in nursing care of older adults is important to promise high standard patients' outcomes. Reliable and appropriate instrument measured clinical reasoning skills in gerontological nursing was not readily available. The purpose of this study was to develop and validate the Gerontological Nursing Clinical Reasoning Scale in Thailand. A cross-sectional study was performed with a psychometric evaluation of this new developed scale. A pool of 18 short clinical vignettes composed of 72 items with a 5-response Likert type scale was initially developed in the format of the Script Concordance Test. The Script theory and the hypothetical-deductive theory were applied. The scale development process had six steps, including content validity and reliability assessment. Then, it was tested in 80 participants who were in equal groups of senior nursing students and registered nurses in Phayao province. The construct validity by known group technique was used. Twelve advanced practice nurses who were specialized in gerontological nursing and considered as a panellist group were involved. The scores among groups were compared by using the one-way analysis of variance with a Scheffe's post hoc test. The 14-vignettes the Gerontological Nursing Clinical Reasoning Scale which comprised 47 items was finalized. The findings showed that the panellists, registered nurses, and nursing students had statistical different mean scores. The panellists had the highest scores, followed by the registered nurses, and nursing students, respectively. The Scale had an acceptable level of construct validity and internal consistency and could distinguish clinical reasoning skills among the three groups of nurses sampled. Nursing educators can introduce this scale to measure clinical reasoning in gerontological nursing courses but further testing with other populations is needed.

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Introduction

In most countries, people are living longer on average and often develop multiple illnesses which need advanced care. Nurses, both newly graduated and experienced, have to be sufficiently qualified and skilled in order to meet the needs of the aging population.[1] In Thailand, the setting of this study, gerontological nursing is one of eight subjects in which nursing students are required to gain experience

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and then take an examination before obtaining the Thai Nursing License. Being faced with complex, unpredictable and dynamic clinical care situations is a challenge for nurses, especially newly graduated nurses. They are expected to be able to speedily analyze, make decisions in a timely manner, and provide effective and proper care for patients in multifaceted and uncertain circumstances in order to guarantee positive patient outcomes.[2] Clinical reasoning (CR) is a basic cognitive process for nurses to use in patient care and they are expected to be able to integrate a patient's problems with skilled interventions using accurate reasoning.[3] Levett-Jones and associates defined clinical reasoning as a thinking and decision-making process which involves considering a situation, gathering cues and processing the information to identify problems. This leads to the development of plans, applying solutions, evaluating, and reflecting on lessons learned.[4] According to Simmons, clinical reasoning is a complex cognitive process involving both formal and informal rational approaches to collect and scrutinize patient data.[5] This reasoning includes in its process, legal, ethical, and professional components.[4, 6] In this study, the clinical reasoning in gerontological nursing of nursing students was defined as a capacity of senior nursing students to interpret, calculate and analyze information derived from scenarios related to older adults. They then were required to use reasoning to determine appropriate assessment, hypothesis, intervention, and evaluation based on the vignettes provided.

Nursing education programs need to assist students to gain confidence and achieve nursing competency for safe and effective care in varied situations. During their learning journey, students are expected to develop clinical reasoning skills based on a cognitive learning model in the classroom and in the clinical environment by putting their efforts evaluating clinical facts so that a clear perception of a patient's problems emerges.[7] Giving appropriate justifications to provide suitable care for individuals, especially older adults who have multiples diseases, is even more challenging for nursing students in clinical settings. A study by Staydt and Merriman showed that 421 nursing students had a wide variety of clinical placements, yet nearly two-thirds did not have enough confidence in providing nursing interventions to meet patients' safety.[8] During four years in nursing school, students might have variable levels of supervision as well as different clinical settings and inconsistent opportunities to practice.[8] In another study the level of clinical reasoning skills assessed in senior nursing students in Thailand was rated as only "moderate" when they graduated and were waiting to take their nursing license examination.[9] During four years in nursing school, students might have different frequency of opportunities to practice, level of supervision, and clinical settings.[8] This can affect the level of their confidence and clinical reasoning skills.

The process of training nursing students to attain educational outcomes, particularly in clinical reasoning, has been observed and evaluated by various conventional techniques such as direct observation,[10,11] multiple choice questionnaires (MCQs), oral examination,[12] and objective structured clinical examination (OSCE).[13] Direct behavioural observation lacks a clear pattern. The objective examination is also problematic as there is a selection bias.[2] A MCQs is reliable in assessing the technical reasons, but it cannot be used to assess reasoning skills in the clinical situation in which there is not enough information or circumstances that are highly uncertain.[14] Although being an alternative choice, the oral examination also has its limits in setting the standard for assessing and rating, as well as application in large groups. The clinical reasoning skill in the OSCE can similarly be influenced by different format and amount of inter-station.[15]

The Script Concordance Test (SCT) is a tool to assess clinical reasoning. It was developed by a group of medical professors in Canada and the Netherlands around 18 years ago and based on cognitive psychology script theory and hypothetical-deductive theory.[16] The former is used to explain patterns or scripts of human behaviour, while the latter one involves information processing, testing hypotheses, and clinical decision making.[17] Using cognitive psychology script theory, new clinical information of patients emerges and is valued by clinicians in interpretation and making clinical judgments. The SCT has been used in medical education as an alternative approach when using reasoning in unclear circumstances. A respondent must decide on a possible diagnosis to find alternative approaches, or investigative and treatment options which are selected on a Likert scale.[18,19] This tool is used to evaluate specific aspects of clinical reasoning and the ability to translate the medical information under conditions of uncertainty.[20,21]

Methods

Study design

A cross-sectional study composed of two phases, the development of the Geron-NCRS and psychometric testing.

Samples and Settings

During the scale development phase, five advanced practice nurses (APNs) were interviewed. During the next phase of the psychometric testing, there were 40 RNs from a general hospital located in the northern region in Thailand who had been working in medical or surgical departments and had experienced in nursing for at least two years. Also, 40 senior nursing students from a nursing college in the same region were recruited to the study. These students were required to have finished their clinical placements in community and hospital-based settings. Also, 12 of a total of 25 APNs specializing in gerontological nursing throughout the country agreed to complete the scale.

Ethical considerations

Study approval was received from the Research Ethical Review Committee of the Phayao Hospital (COA No.9), and Boromarajonnani College of Nursing, Phayao (10/2016), Thailand. Data collection took place April-May 2017. All participants signed informed consent forms and had the right not to participate in the research. They were able to withdraw from the research at any time. They could do so without advanced notifications or apprehensions of losing any entitlements. All research data was de-identified and stored in a secure cabinet whilst computer files were protected by a password.

Development of the Geron-NCRS

The development of the Geron-NCRS comprised six steps: 1) Clarifying definition and elaborating of the clinical vignette/scenario, 2) generating an item pool, 3) choosing the format of measurement, 4) content validation, 5) evaluation of vignettes and items, and 6) examinees' testing and scoring assembly.[30]

Step 1: Clarifying definition and elaborating of the clinical vignette/scenario

The scope of scale development was elucidated by a literature review and the Thai Nursing Council licensing test blueprint in gerontological nursing being taken into account. Then, five APNs with expertise in gerontology were interviewed to determine key aspects of gerontological nursing required for undergraduate students. A scale development outline was achieved. The scale was used to measure competency in knowledge, skills, and attitudes to care for older adults who displayed signs of the geriatric syndrome typical of aging. These include insomnia, malnutrition, osteoporosis, hearing and visual impairment, dementia/delirium, depression, chronic illness (such as diabetes, hypertension, cerebrovascular disease, benign prostate hypertrophy, and cancer), end of life care, and poly-pharmacy. Health assessment, communication, health promotion, and rehabilitation skills were also encompassed both in the community and institutionalized situations.

Step 2: Generating item pool

A pool of 18 short clinical vignettes with a total of 72 Likert scale items in Thai to assess clinical competence in gerontological nursing was developed. It contained patient assessment, nursing diagnosis, and nursing intervention domains.

Step 3: Choosing the format of measurement

The Likert type scale had five response options (-2, -1, 0, +1, and +2), ranging from completely contraindicated (-2) to completely indicated or absolutely necessary (+2).

Step 4: Content validation

The research team screened, discussed and evaluated the 72 items within the 18 vignettes. Three vignettes were deleted due to redundancy and being not a match for gerontology, leaving 15 vignettes and

60 items. A panel of three content experts, who were specialists in gerontology, clinical reasoning, and nursing education, were then asked to review and rate the 60-item Geron-NCRS for relevance, comprehension, and clarity. No item needed to be removed, but some minor revisions were required.

Step 5: Evaluation of vignettes and items

Ten nursing students were then asked to complete the scale in order to measure its readability. Test instructions were given to the students for partaking, rating and commenting on the instrument and individual vignette and item. The feedback was verified and taken to scale revision for its clarity and understandability.

Step 6: Examinees' testing and scoring assembly

The known group validity method was adopted. In the beginning, 20 of 25 APNs specialized in gerontology throughout the country were contacted and invited by phone to be in a panellist group. Twelve panellists accepted invitations. According to Gagnon and Charlin, a panel of 10-15 expert members is appropriate to produce credible and reliable scores.[31] The scoring grid was then generated and calculated, with a maximum of 1 for each item. Any item with bi-modal, uniform divergence or discrete outlier response was discarded. Some extreme answers were deleted and some "median" answers were discussed or deleted.[32] To assess the psychometric properties of the Geron-NCRS with a paper-pencil format, a cross-sectional study was implemented by recruiting two more groups of participants. The sample size was calculated with a power of 0.95, an error of 0.05, and a medium effect size of 0.25. It was determined that 40 subjects were needed per group.

The first group was 40 senior nursing students from a nursing college; the second group was made up of 40 RNs with no expertise in gerontology, recruited from a tertiary hospital in the northern region of Thailand. For the RNs and students, convenience sampling on a voluntary basis was applied and invitation letters were sent to participants. All nursing students and RNs had experience in both community and hospital settings. The student group had finished community work two months before recruitment while the RNs worked in a community setting for much longer.

In addition, demographic data record forms for the three groups were established. In the student group, age, gender, average grade point (GPA), confidence while studying a gerontological nursing course, and confidence to pass the gerontological nursing comprehensive examination were asked. For the RNs, age, gender, work department, years of work experience, activeness of providing care of older adults, and preferences and confidence in taking care of older adults were included. For the panellists, age, gender, work setting, and years of experience as an APN in gerontology were also inquired. The content validity of these forms was also achieved by three experts, a nursing faculty member who specialized in clinical reasoning and the script concordance test, an APN in gerontology, and a nursing faculty who specialized in gerontology.

Data Analysis

Statistical analysis was done with the Statistical Package for the Social Sciences (SPSS), Predictive Analytics SoftWare (PASW) Statistics Program version 20. Descriptive and inferential statistics were applied during data analysis. Statistical significance at the 0.05 level was considered acceptable. The demographics of the three groups of participants were calculated and the normality of score distributions was evaluated by a Shappiro-Wilk's test. A t p-value greater than 0.05 along with illustration of a histogram, normal Q-Q plots and box plots indicated that the scores of each group were normally distributed. The homogeneity of group variance was estimated with the Levene's test ($p>.05$) and showed that this assumption was not violated ($p=0.10$). To compare differences within and between mean scores of the three groups, one-way analysis of variance (ANOVA) with a Scheffe's post-hoc test were used due to unequal samples.

Reliability and Internal Consistency

The content validity of the Geron-NCRS was at 0.90. The reliability was set using the Cronbach's coefficient at 0.75, indicating its satisfactory reliability coefficient.[33] Pass and fail cut-off scores were also performed from the panellists' mean score and standard deviations. For the undergraduate students, the cut-off score at 3-4 standard deviations (-4*SD* and-3*SD*) below the panellists' mean scores were suggested and a smaller number of standard deviations were considered in recent graduates.[34, 35] The cut-off score at -4 and -2 standard deviations (-4*SD* and-2*SD*) were used in this study.

Results

Instrument Development

To obtain the scoring grid of the 60-item Geron-NCRS, the scores from 12 APNs were calculated. There were 7 out of 15 vignettes that had each item showed a single modal response. Also, bi-model responses were found in vignette 1 (items 2 and 3) and vignette 15 (items 57, 59 and 60). Consequently, four items (57, 58, 59 and 60) in vignette 15 were deleted because it was left with one item (56). Nine more items (2, 3, 6, 9, 15, 20, 22, 39, and 43) from 8 of the vignettes (numbers 1, 2, 3, 4, 5, 6, 10, and 11) were also deleted[32] because of a single or bi-modal response. The final version of the Geron-NCRS comprised 14 vignettes with 47 items; each vignette has 2-4 nested items shown in **Table 1**. The scores ranged from 4.46 to 47, with higher scores indicating more clinical reasoning skill. It took 45-60 minutes to complete the Scale. The scoring grid of the reference panel for the 47-item Geron-NCRS is shown in **Table 2**. The process of scale development is displayed in **Figure 1**.

Table 1 Example vignettes

You work as community nurse. You visit Mrs. Lin, a 70 year old woman with the history of diabetes and osteoarthritis. Mrs. Lin tells you that she does not want to go out and join the community activity because of frequent toileting and urine leakage. She normally needs to urinate 7-8 times during the day and 4-5 times at night.

Item	Column 1	Column 2	Column 3
1.	If you thought to ask Mrs. Lin about her routine medications.	And then Mrs. Lin says "I haven't had any surgery or experienced any allergy"	The relevance of this assessment becomes: ☐ completely or partially contraindicated ☐ not very useful or possibly harmful ☐ neither more nor less useful ☐ useful ☐ necessary or absolutely necessary
2.	If you thought to ask Mrs. Lin what help she needs the most.	Mrs. Lin says "I has been taking good care of myself and I don't understand why it happens to me"	The relevance of this assessment becomes: ☐ completely or partially contraindicated ☐ not very useful or possibly harmful ☐ neither more nor less useful ☐ useful ☐ necessary or absolutely necessary
3.	If you plan to assess Mrs. Lin's stress level	Mrs. Lin feels that she has become her family burden.	The relevance of this assessment becomes: ☐ rejected ☐ less relevant or possibly less appropriate ☐ the information has no effect on the assumption ☐ needs to be explored in the near future ☐ needs to be explored in the immediate future
4.	If you plan to talk with Mrs. Lin's daughter about bathroom modifications	Mrs. Lin says "I like gardening and it my stress killers"	The relevance of this intervention becomes: ☐ completely or partially contraindicated ☐ not very useful or possibly harmful ☐ neither more nor less useful ☐ useful ☐ necessary or absolutely necessary

Table 2 Scoring grid from the panellists

Vignettes	Items	Responses				
		-2	-1	0	+1	+2
1.	Chronic kidney disease and Gout					
	1. AVF and arm exercise	0.00	0.22	0.11	1.00	1.00
	2. Physical injury risks	0.00	0.40	0.60	0.40	1.00
	3. Follow up and medication adherence	0.00	0.00	0.13	0.38	1.00
2.	Chronic pulmonary disease and Vision					
	4. Cataract and treatment	0.50	1.00	0.30	0.50	0.80
	5. Taking medication assessment	0.00	0.33	0.67	0.00	1.00
	6. Pulmonary rehabilitation	0.00	0.20	0.40	0.80	1.00
3.	Diabetes mellitus					
	7. Foot examination	0.00	0.00	0.83	0.17	1.00
	8. Depression screening	0.00	0.00	0.60	0.80	1.00
	9. Assessment of insulin injection practice	0.50	0.50	0.50	0.50	1.00
4.	Cerebrovascular disease and Pressure Sores					
	10. Pressure sore assessment	0.14	0.43	0.14	0.00	1.00
	11. Discharge planning needs	0.00	0.00	0.33	1.00	0.70
	12. Caregiver support and stress reduction	0.00	0.00	0.43	0.29	1.00
5.	Hypertension and Osteoporosis					
	13. Perception the risks of hip fracture	0.00	1.00	0.40	0.20	0.80
	14. Skin assessment	0.20	1.00	0.60	0.00	0.60
	15. Gathering and giving information to families	0.00	0.00	0.22	0.11	1.00
6.	Liver cancer and End of life care					
	16.Giving information to families	0.00	0.11	0.11	0.11	1.00
	17. Pain assessment	0.00	0.67	0.33	0.00	1.00
	18. Preparing families for loss	0.11	0.00	0.11	0.11	1.00
	19. Non pharmacological relaxation techniques	0.14	0.14	0.14	0.29	1.00
7.	Breast cancer and Depression					
	20. Caregiver burnout assessment	0.00	0.00	0.11	0.22	1.00
	21. Chemotherapy side effects	0.00	0.00	0.14	1.00	0.60
	22. Chemotherapy administration	0.17	0.50	0.33	0.00	1.00
	23. Integrating spiritual care	0.00	0.00	0.11	0.22	1.00

Table 2 Scoring grid from the panellists (Cont.)

Vignettes	Items	Responses				
		-2	-1	0	+1	+2
8.	Dementia and Cerebrovascular disease					
	24. Assessment of activity of daily living	0.00	0.13	0.13	0.25	1.00
	25. Assessment of Caregiver's knowledge	0.22	0.00	0.11	0.00	1.00
	26. Assessment of patients' knowledge	0.00	0.00	0.57	0.14	1.00
	27. Aggressive behaviour approach	0.00	0.40	0.80	0.20	1.00
9.	Diabetes mellitus, Hypertension, Poly-pharmacy and Cerebrovascular disease					
	28. Smoking history- taking skill	0.17	0.33	0.33	0.17	1.00
	29. Medicines and side effects	0.00	0.29	0.43	0.00	1.00
	30. Giving information of symptom progression	0.00	0.00	0.11	0.11	1.00
	31. Family education	0.00	0.50	1.00	0.00	0.50
10.	Chronic kidney disease and BPH					
	32. Knowledge the causes of disease	0.00	0.29	0.29	0.14	1.00
	33. BPH and urinary incontinence	0.20	0.20	1.00	0.60	0.40
	34. Skin care and urinary incontinence	0.00	0.33	0.50	0.17	1.00
11.	Diabetics and Hypertension and					
	35. History taking and examination	0.00	0.17	1.00	0.33	0.50
	36. Alcohol consumption assessment	0.00	0.43	0.29	0.00	1.00
	37. Fall risks	0.25	1.00	0.25	0.75	0.75
	38. Medication non-adherance	0.00	0.20	0.80	0.40	1.00
12.	Cerebrovascular disease and Constipation					
	39. Wound care	0.17	0.50	0.00	0.33	1.00
	40. Constipation assessment	0.20	1.00	0.20	0.20	0.80
	41. Physical rehabilitation	0.00	0.40	1.00	0.20	0.80
	42. Constipation and diet	0.22	0.11	0.00	0.00	1.00
13.	Colon cancer, Surgery and Delirium					
	43. Delirium and medication	0.00	0.00	0.83	0.17	1.00
	44. Delirium and restraints	0.75	.50	0.75	0.00	1.00
	45. A family approach to delirium	0.00	0.00	1.00	0.60	0.80
14.	Hypertension, Arthritis and Urinary incontinence					
	46. Medication and urinary incontinence	0.00	0.40	0.80	0.20	1.00
	47. Home modification and urinary incontinence	0.20	1.00	1.00	0.00	0.20

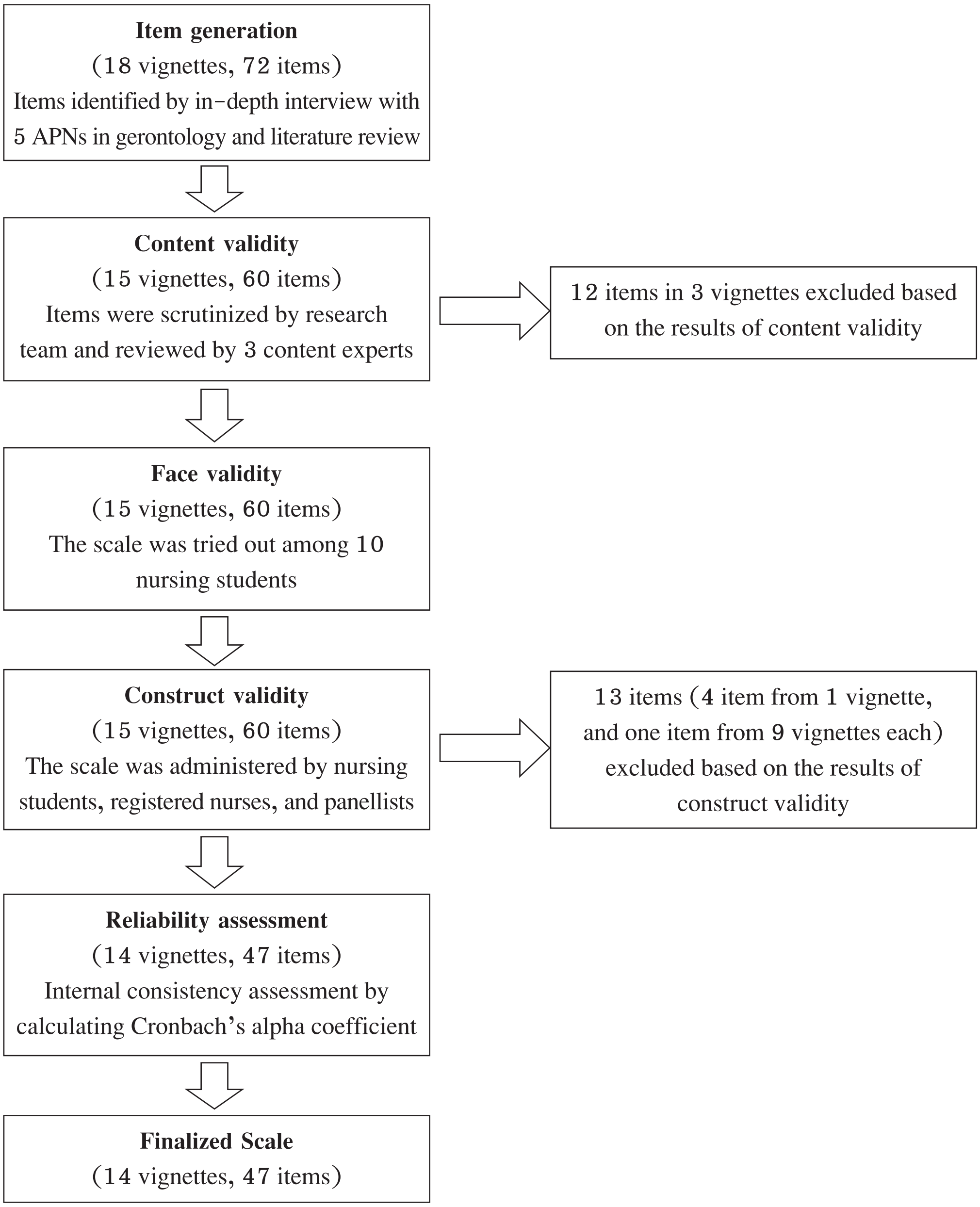


Figure 1 Diagram of scale development

Psychometric Testing

Demographic data of participants

The majority of the students were female (n=36) and their ages ranged from 21-22 years. Sixty (n=24) and 25% (n=10) of them had grade point average (GPA) at 3.01-3.50 level and 2.51-3.00 level, respectively. Seventy-seven percent (n=31) of the student participants felt confident while studying the gerontological nursing courses. Sixty-five percent (n=26) felt moderately confident that they would pass the gerontological nursing comprehensive examination before they graduated, and 75% (n=30) passed that examination at the first attempt.

For the RN group, 95% were female (n=38) and 5% male (n=2). Ages ranged from 25-53 years (mean=36.95, *SD*=6.59). Half of the group was working in a medical department; the rest in a surgical department, and the nurses' work experience ranged from 3-31 years (mean=16.24, *SD*=8.20). They were actively caring for older adults in the current workplace. The preferences in providing care for older adults among RNs were neutral (50%), some preference (47.5%) and high preference (2.5%), while the confidence in providing care for seniors were some confidence (52.5%), average confidence (37.5%) and some unconfidence (10%).

For the panellist group, 92% were females (n=11) and 8% male (n=1), ages ranged 32-45 years (mean= 42.5, *SD*=4.58). Nine out of twelve were working in tertiary hospitals, in the areas of medical, surgical, orthopedic, ophthalmology and otorhinolaryngology departments. The rest were working in community hospitals. The APNs' experience in years ranged from 4-8 years (mean= 5, *SD*=3).

Psychometric results

To test if the tool could differentiate between experts, RNs and nursing students in their clinical reasoning skill in gerontology, the scores of each group were compared. The scores measured by the finalized Geron-NCRS revealed statistically significant variations between groups as calculated by one way ANOVA, ($F(2, 89)=20.09$, $p<0.001$), indicating that not all groups had the same level of clinical reasoning skill. In a Scheffe's post hoc procedure to determine the pair, the group means differed significantly. The findings are revealed in **Tables 3 and 4** and the clinical reasoning score of panellist group (mean= 35.05, *SD*=3.64) showed greater scores than students (mean= 25.01, *SD*=4.25) and RNs (mean= 27.40, *SD*=5.57) ($p<0.001$).

Table 3 Mean and standard deviation among groups of clinical reasoning scores

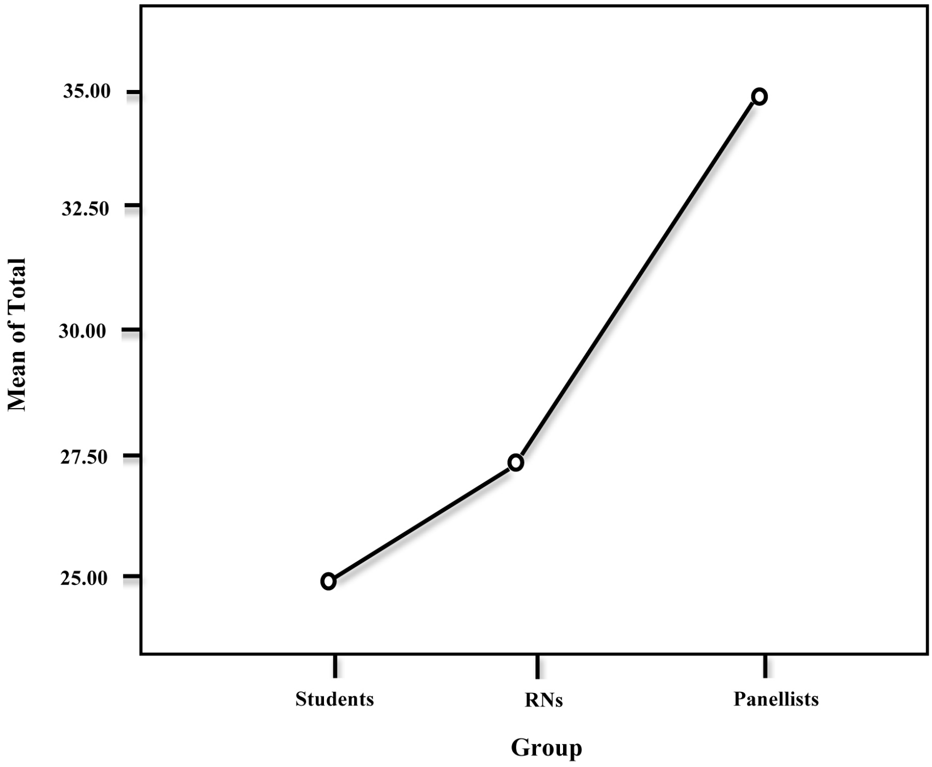
Group	n	Mean	SD
Students	40	25.01	4.25
Nurses	40	27.40	5.57
Panellists	12	35.05	3.64
All	92	27.36	5.73

Table 4 Multiple comparisons among groups calculated by Turkey HSD post hoc test

Group	Group	Mean difference	Std. Error	Sig.	95% confidence Interval	
					Lower Bound	Upper Bound
Students	Nurses	-2.40	1.07	0.91	-5.06	0.29
	Panellists	-10.04*	1.58	0.00	-13.98	-6.09
Nurses	Students	2.38	1.07	0.91	-0.29	5.06
	Panellists	-7.65*	1.58	0.00	-11.59	-3.70
Panellists	Students	10.04*	1.58	0.00	6.09	13.98
	Nurses	7.65*	1.58	0.00	3.70	11.59

*The mean difference is significant at the 0.05 level

There was no statistically significant difference of mean score between students and RNs (*p*=0.06), displayed in Figure 2. The pass and fail score at -4 and -2 standard deviations (-4*SD* and -2*SD*) of the panellist mean score were 20.49 and 27.77. There were 35 (87.5%) students and 95% (n=38) nurses who had passed the score at the -4*SD* level while 27.5% (n=11) students and 42.5% (n=17) nurses accomplished at the -2*SD* level. The reliability, the Cronbach's alpha coefficient, of the 60-item and 47-item Geron-NCRS were 0.80 and 0.82, respectively. More specifically, individual items of the final scale were started from 0.807-0.826.



The mean difference is significant at the 0.05 level.

Figure 2 Comparison of mean scores among three groups.

Discussion

The assessment of cognitive functioning, especially clinical reasoning competency, is challenging. This study is one of the first to develop and assess the psychometric properties of the 47 items Geron-NCRS that has 20, 9, and 18 items in patient assessment, nursing diagnosis and nursing implementation respectively. It is reasonable to conclude that this tool, which was developed on the Script Theory, is valid and reliable. The content validity was at a satisfactory level of agreement. The internal reliability of this scale was higher than references with a Cronbach's alpha of 0.82 that is similar to other studies.[36] The construct validity was achieved by known group technique [25, 26]

This scale can be an alternative option to test clinical reasoning skills in gerontological nursing at different stage of clinical experiences. Although vignette construction is time consuming,[37] this scale has some benefits over traditional test methods, especially those which have solving skills with ill-defined problems.[38] As hypothesized, the Geron-NCRS can be used to differentiate scores among panellists, RNs, and nursing students, except between students and RNs. There are some explanations that could clarify similarities of mean score between students and RNs. This phenomenon could be explained by the fact that the scoring grid, designed by experts, might not be suitable for the RNs in this study, who were mostly focused in an institutional setting, sub-specialty.[39, 40] In comparison, the student group had recently studied and was located in more variety of settings especially in the community field before taking the assessment. Some participants in the registered nurse group still had a low number of years (3 years) in their nursing career in a hospital-based setting. They might be perceived as lacking in experience.[41] The GPA in the student group might also be positively influenced by the clinical reasoning in this study.[15]

There are some validation concerns and administration techniques used with this scale that should be discussed. The 47-item Geron-NCRS has 14 vignettes which are lower than the recommendation of 15-25 vignettes. However, the numbers of items per vignettes were satisfactory at 2-4 items.[42] Even though generated and calculated by sufficient panellists, the scoring grid still has some limitations. The distribution of the panellists was of some concern. Eight out of twelve were recruited from a hospital-based background; and it could be argued that more community-based experts should be invited to this study. Besides, there were 30 items that maximum score was located at the +2 option[1] and the least response was more likely to be at the -2 option. Nouh and colleagues have suggested that embracing a 3-point Likert format could be an alternative.[40] In contrast, Wilson and colleagues proposed that a 5 or 6-point Likert format was more reliable than a 3-point Likert format.[43] Thirdly, despite its effectiveness and representation of uncertain situations, the Geron-NCRS still needs to keep its content updated. The agreement among experts might change over time due to the on-going development of knowledge, information, resources, regulation and clinical guidelines. This raises the question about whether the frequency of the vignettes, items revision and scoring re-affirmation need to be updated. Some limitations of this study should be cited. The sample sizes limit the generalizability of findings, and may lead to mismatching and possible variations. The panellists were recruited from different parts of the country, but the students and RNs were particularly based in the northern Thai region which might indicate inconsistency especially in geographical and cultural differences. The application of this scale should also be mentioned. An administration of this measurement can be completed in an hour. However, examinees, who are less familiar with this configuration of examination, might perceive the test format and make decisions based on insufficient information scenarios to be frustrating and confusing, and this might affect their performances and scores. Examinees also might feel the need to be prepared and have the opportunity to try out some example vignettes and items beforehand. This could take approximately 30 minutes for the introductory session.

Conclusion

Thailand is approaching the era that we called aging society. Because of this impending crisis, gerontology nurses are the front line of health care team for older adults in a wide variety of settings. The need for a valid and reliable scale to assess the clinical reasoning skill of nursing personnel in this growing field exists in order to promise the positive patient outcomes. The process of scale development and the findings in this study affirm the validity and reliability of the Geron-NCRS. It also offers a new approach to assess cognitive skills in nursing students. The processes were composed of clarifying definition and elaborating of the clinical vignette/scenario, generating item pool, choosing the format of measurement, content validation, evaluation of vignettes and items, and examinees' testing and scoring assembly. Exploration into re-calculating the scoring grid is recommended. The ground-breaking approach by using the Script Concordance Test was introduced to Thai nursing professionals in this study. Implications for nursing practice, education, and research should also be mentioned. Nurse leaders or managers could use this scale to assess the RNs' clinical reasoning in providing care to seniors and to prove the impact of the nursing practice on patient safety and outcomes. Besides, nurse educators could routinely apply this scale to evaluate nursing students before they graduate which later can associate with the results of the national nursing license examination. For researchers, future studies are suggested in the use of this scale in summative assessment. This would involve using a different level of nursing students with more participants from various institutes. In this case, preparation of the test into an on-line format to obtain faster results is suggested. Panellists' decisions or responsiveness should be explored in qualitative data, especially if there are items with contradictory responses. Lastly, our scale needs to be tested with different population groups in different settings.

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References

1. Hofler L, Thomas K. Transition of new graduate nurses to the workforce: Challenges and solutions in the changing health care environment. North Carolina Medical Journal. 2016;77(2):133-136.
2. Banning M. The think aloud approach as an educational tool to develop and assess clinical reasoning in undergraduate students. Nurse Education Today. 2008;28.
3. Hunter S, Arthur C. Clinical reasoning of nursing students on clinical placement: Clinical educators' perceptions. Nurse Education in Practice. 2016;18:73-9.
4. Levett-Jones T, Hoffman K, Dempsey J, Jeong SY, Noble D, Norton CA, et al. The 'five rights' of clinical reasoning: An educational model to enhance nursing students' ability to identify and manage clinically 'at risk' patients. Nurse Education Today. 2010;30(6):515-20.
5. Simmons B. Clinical reasoning: Concept analysis. Journal of advanced nursing. 2010;66(5):1151-1158.
6. McCartney M. Nurses must be allowed to exercise professional judgment. BMJ. 2017;356:j1548.
7. Goudreau J, Boyer L, Letourneau D. Clinical nursing reasoning in nursing practice: A cognitive learning model based on a think aloud methodology. Quality Advancement in Nursing Education. 2014;1(1):1-18.
8. Stayt LC, Merriman C. A descriptive survey investigating pre-registration student nurses' perceptions of clinical skill development in clinical placements. Nurse Education Today. 2013;33(4):425-430.
9. Tapaneeyakorn V, Kosolchuenvijit J, Anonrath K, Wannasuntad S, Srikan P. Factors affecting clinical reasoning in nursing students of Boromarajonani College of Nursing Bangkok. Journal of Health Science Research. 2016;10(1):70-77.
10. Junod Perron N, Louis-Simonet M, Cerutti B, Pfarrwaller E, Sommer J, Nendaz M. Feedback in formative OSCEs: Comparison between direct observation and video-based formats. Medical Online. 2016;21:32160.
11. Halman S, Dudek N, Wood T, Pugh D, Touchie C, McAleer S, et al. Direct observation of clinical skills feedback scale: Development and validity evidence. Teaching and Learning in Medicine. 2016;28(4):385-394.
12. Orrock P, Grace S, Vaughan B, Coutts R. Developing a viva exam to assess clinical reasoning in pre-registration osteopathy students. BioMed Central Medical Education. 2014;14(1):193.
13. Kelly MA, Mitchell ML, Henderson A, Jeffrey CA, Groves M, Nulty DD, et al. OSCE best practice guidelines-applicability for nursing simulations. Advances in Simulation (London, England). 2016;1:10.

14. Zamani S, Amini M, Masoumi SZ, Delavari S, Namaki MJ, Kojuri J. The comparison of the key feature of clinical reasoning and multiple choice examinations in clinical decision makings ability. Biomedical Research. 2017;28(3):1115-1119.
15. Park WB, Kang SH, Lee YS, Myung SJ. Does objective structured clinical examinations score reflect the clinical reasoning ability of medical students? The American Journal of Medical Sciences. 2015;350(1):64-67.
16. Charlin B, Roy L, Brailovsky C, Goulet F, van der Vleuten C. The Script Concordance test: A tool to assess the reflective clinician. Teaching and Learning Medicine. 2000;12(4):189-195.
17. Lubarsky S, Dory V, Duggan P, Gagnon R, Charlin B. Script concordance testing: From theory to practice: AMEE guide No. 75. Medical Teacher. 2013;35(3):184-193.
18. Kazour F, Richa S, Zoghbi M, El-Hage W, Haddad FG. Using the Script Concordance Test to evaluate clinical reasoning skills in psychiatry. Academic Psychiatry. 2017;41(1):86-90.
19. Wan M. Using the script concordance test to assess clinical reasoning skills in undergraduate and postgraduate medicine. Hong Kong Medical Journal 2015;21(5):455-461.
20. Nseir S, Elkalioubie A, Deruelle P, Lacroix D, Gosset D. Accuracy of script concordance tests in fourth-year medical students. International Journal of Medical Education. 2017;8:63-9.
21. Duggan P, Charlin B. Introducing recent medical graduates as members of Script Concordance Test expert reference panels: What impact? MedEdPublish. 2016;5(2):32-44.
22. Cobb KA, Brown G, Hammond R, Mossop LH. Students' perceptions of the Script Concordance Test and its impact on their learning behavior: A mixed methods study. Journal of Veterinary Medical Education. 2015.
23. Goos M, Schubach F, Seifert G, Boeker M. Validation of undergraduate medical student script concordance test (SCT) scores on the clinical assessment of the acute abdomen. BMC surgery. 2016;16(1):57-.
24. Borges PFB. Script Concordance Test: A proposal for evaluation of the management of nursing reasoning in uncertain situations. Botucatu, Portugal: Universida de Estadual Paulista; 2016.
25. Dawson T. Can script concordance testing be utilized in nursing education to accurately assess clinical reasoning skills?. Cullowhee, NC: Western Carolina University, Cullowhee, NC; 2014.
26. Deschênes MF, Goudreau J. Addressing the development of both knowledge and clinical reasoning in nursing through the perspective of script concordance: An integrative literature review. Journal of Nursing Education and Practice. 2017;7(12):29-38.
27. Peeters C, de Groot-Bolluijt W, Gobbens R, van Brunschot M, editors. Digital Script Concordance Test for Clinical Reasoning. CAA: International Computer Assisted Assessment Conference; 2014; Zeist, The Netherlands: Springer, Cham.
28. Piovezan RD, Custodio O, Cendoroglo MS, Batista NA, Lubarsky S, Charlin B. Assessment of undergraduate clinical reasoning in geriatric medicine: Application of a script concordance test. Journal of American Geriatric Society. 2012;60(10):1946-1950.
29. Ruiz JG, Tunuguntla R, Charlin B, Ouslander JG, Symes SN, Gagnon R, et al. The Script Concordance Test as a measure of clinical reasoning skills in geriatric urinary incontinence. Journal of the American Geriatric Society. 2010;58(11):2178-2184.
30. Pantulawan S, Kunavikitikul W, Nantsupawat, R, Srisuphan W. Development and psychometric testing of the Nursing Performance for Patient Safety Scale. Pacific Rim International Journal of Nursing Research. 2016:20 (1):45-59.
31 Gagnon R, Charlin B, Coletti M, Sauve E, van der Vleuten C. Assessment in the context of uncertainty: How many members are needed on the panel of reference of a script concordance test? Medical Education. 2005;39(3):284-291.
32. Lineberry M, Kreiter CD, Bordage G. Threats to validity in the use and interpretation of script concordance test scores. Medical Education. 2013;47(12):1175-1183.
33. Fournier JP, Demeester A, Charlin B. Script Concordance Tests: Guidelines for construction. BioMed Central Medical Informatics and Decision Making. 2008;8(1):18.
34. Charlin B, Gagnon R, Lubarsky S, Lambert C, Meterissian S, Chalk C, et al. Assessment in the context of uncertainty using the script concordance test: More meaning for scores. Teaching and Learning in Medicine. 2010;22(3):180-186.
35. Duggan P, Charlin B. Summative assessment of 5th year medical students' clinical reasoning by Script Concordance Test: Requirements and challenges. BMC Meical Education. 2012;12(29).

36. Mathieu S, Couderc M, Glace B, Tournadre A, Malochet-Guinamand S, Pereira B, et al. Construction and utilization of a script concordance test as an assessment tool for dcem3 (5th year) medical students in rheumatology. BioMed Central Medical Education. 2013;13(1):166.
37. Boulouffe C, Doucet B, Muschart X, Charlin B, Vanpee D. Assessing clinical reasoning using a script concordance test with electrocardiogram in an emergency medicine clerkship rotation. Emergency Medicine Journal. 2014;31(4):313-316.
38. Humbert AJ, Besinger B, Miech EJ. Assessing clinical reasoning skills in scenarios of uncertainty: Convergent validity for a Script Concordance Test in an emergency medicine clerkship and residency. Academic Emergency Medicine. 2011;18(6):627-34.
39. Charlin B, Tardif J, Boshuizen HP. Scripts and medical diagnostic knowledge: Theory and applications for clinical reasoning instruction and research. Academic Medicine. 2000;75(2):182-190.
40. Nouh T, Boutros M, Gagnon R, Reid S, Leslie K, Pace D, et al. The Script Concordance Test as a measure of clinical reasoning: A national validation study. American Journal of Surgery. 2012;203(4):530-534.
41. Uy RC, Sarmiento RF, Gavino A, Fontelo P. Confidence and information access in clinical decision-making: An examination of the cognitive processes that affect the information-seeking behavior of physicians. AMIA Annual Symposium Proceedings. 2014;2014:1134-1140.
42. Gagnon R, Charlin B, Lambert C, Carriere B, Van der Vleuten C. Script Concordance Testing: More cases or more questions? . Advances in Health Science Education: Theory and practice. 2009;14(3):367-375.
43. Wilson AB, Pike GR, Humbert AJ. Analyzing script concordance test scoring methods and items by difficulty and type. Teaching and Learning in Medicine. 2014; 26(2):135-145.

การพัฒนาและตรวจสอบคุณภาพของแบบประเมินการให้เหตุผลทางคลินิกในการพยาบาลผู้สูงอายุ

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บทคัดย่อ: การประเมินทักษะการให้เหตุผลทางคลินิกในการพยาบาลผู้สูงอายุในนักศึกษาพยาบาลนั้นมีความจำเป็น ซึ่งจะส่งผลให้เกิดผลลัพธ์ทางการพยาบาลที่ได้มาตรฐาน แต่ยังขาดเครื่องมือในการประเมินทักษะการให้เหตุผลทางคลินิกในการพยาบาลผู้สูงอายุ วัตถุประสงค์ของการศึกษาครั้งนี้เป็นการพัฒนาและการตรวจสอบคุณภาพของเครื่องมือในการประเมินการให้เหตุผลทางคลินิกในการพยาบาลผู้สูงอายุของนักศึกษาพยาบาล โดยเป็นการศึกษาแบบภาคตัดขวาง (Cross-sectional study) **ในการประเมินผลการพัฒนาเครื่องมือที่สร้างขึ้นมาใหม่ โดยมีการสร้างโจทย์สถานการณ์สมมุติ จำนวน 18 สถานการณ์** ซึ่งมีทั้งหมด 72 ข้อ ซึ่งเป็นแบบลิเคิร์ทสเกล (Likert scale) 5 ระดับ ในรูปแบบของการทดสอบความสอดคล้องของสคริปต์ (Script concordance test) โดยใช้ทฤษฎีสคริปต์ (The Script theory) และทฤษฎีสมมุติฐานการอนุมาน (The hypothetical-deductive theory) โดยมีกระบวนการพัฒนาและทดสอบเครื่องมือ 6 ขั้นตอน รวมถึงการตรวจสอบความตรงและความเที่ยงของเครื่องมือ หลังจากนั้นได้ทำการตรวจสอบเครื่องมือกับกลุ่มพยาบาลวิชาชีพและนักศึกษาพยาบาล จำนวน 80 คน แบ่งเป็นกลุ่มละเท่าๆ กัน ส่วนการหาความตรงเชิงโครงสร้างได้มีการทดลองใช้แบบประเมินเปรียบเทียบกับคะแนนของพยาบาลผู้เชี่ยวชาญขั้นสูงด้านการพยาบาลผู้สูงอายุจำนวน 12 คน ซึ่งทำให้ได้แบบประเมินที่มี 14 สถานการณ์ซึ่งมีทั้งหมด 47 ข้อ ผลการเปรียบเทียบคะแนนทักษะการให้เหตุผลทางคลินิกในการพยาบาลผู้สูงอายุ ระหว่างกลุ่มโดยใช้การวิเคราะห์ความแปรปรวนแบบทางเดียว และการเปรียบเทียบความแตกต่างรายคู่โดยวิธีของเชฟเฟ่ (Scheffe’ s post hoc test) ผลการศึกษาพบว่าคะแนนเฉลี่ยของพยาบาลผู้เชี่ยวชาญขั้นสูงด้านการพยาบาลผู้สูงอายุ พยาบาลวิชาชีพ และนักศึกษาพยาบาลแตกต่างอย่างมีนัยสำคัญทางสถิติ กล่าวคือพยาบาลผู้เชี่ยวชาญขั้นสูงด้านการพยาบาลผู้สูงอายุมีคะแนนเฉลี่ยสูงสุด ตามด้วยพยาบาลวิชาชีพและนักศึกษาพยาบาลตามลำดับ จึงกล่าวได้ว่าประเมินการให้เหตุผลทางคลินิกในการพยาบาลผู้สูงอายุสามารถจำแนกความแตกต่างระหว่างทักษะการให้เหตุผลทางคลินิกในกลุ่มตัวอย่างทั้งสามกลุ่มนี้ ซึ่งมีความตรงทางเนื้อหาและความน่าเชื่อถือสามารถนำไปประยุกต์ในด้านการศึกษาพยาบาล โดยนำแบบประเมินทักษะการให้เหตุผลทางคลินิกในวิชาการพยาบาลผู้สูงอายุสำหรับนักศึกษาพยาบาลได้

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Effectiveness of Breastfeeding Skills Training and Support Program among First Time Mothers: A Randomized Control Trial

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Abstract: Exclusive breastfeeding continuously for six months is difficult for new mothers. Breastfeeding problems are caused mostly by improper positioning and incorrect latch-on techniques. This randomized control trial investigated the effects of breastfeeding skills training and support program on 6-month-exclusive breastfeeding among Thai mothers giving birth to their first child in a university hospital of northern Thailand. Eighty-three first-time mothers were recruited and randomly assigned to either the experimental (n=41) or the control group (n=42). The experimental group received the usual care plus the breastfeeding skills training and support program. The control group received only usual care. Data were collected by the Demographic Data Questionnaire, Breastfeeding Self-Efficacy Scale: Short Form, Effective Suckling Checklist, and Food Record form. They were analyzed using descriptive statistics, Chi-square test, and Mann-Whitney U-test.

Results showed that the rate of 6-month-exclusive breastfeeding in the experimental group was significantly higher than those in the control group. Average scores of breastfeeding self-efficacy were significantly higher in the experimental group than those in the control group at discharge and at 6-weeks postpartum, respectively. It is recommended that this program needs further testing with different groups.

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Introduction

Exclusive breastfeeding (EBF) is defined as giving an infant only breast milk with no other liquid or solid food except medical treatment with oral rehydration solution, vitamins, minerals, or medicine.[1] The World Health Organization (WHO) has set the global target to increase the rate of EBF for the first six months of life up to at least 50% in 2025.[1] According to this policy, the Ministry of Public Health of Thailand also set a goal to achieve 6-months EBF to 50% in 2021.[2]

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Evidence suggests that breastfeeding education is effective to increase the rate of BF initiation, but does not have a significant impact on the long-term duration of EBF.[3] Professional and peer support can help mothers to breastfeed for longer periods but their effects are uncertain.[4,5] Combined breastfeeding education and support have been found to be more effective than education or support alone.[5] However, many intervention studies that included breastfeeding education and support together could not increase the rate of 6-month EBF. The United Nations Children's Fund (UNICEF) reported that globally, only 41% of infants aged 0 to 6 months were exclusively breastfed in 2018[6], but in Thailand the total was only 23.1%[7] This low rate of EBF is due to lack of confidence or knowledge, perception of insufficient milk, lack of support, work outside the home, a short duration of maternity leave and stress at work.[8,9] Therefore, a lot of work remains to make EBF a standard for infant feeding.[1]

There are many studies promoting EBF in Thailand, but these programs monitor the EBF for the short periods or the intervention was not comprehensive, especially for first-time mothers.[10] Although they received BF knowledge they might not be able to breastfeed correctly because of inexperience in positioning or latching on of their babies.[11] Therefore, providing an opportunity to practice before childbirth, before facing the real situation, would be helpful.[12] Training new mothers about positioning the baby to attach to the breast and how to express breast milk, store and use it, may also help the mothers to have the necessary skills to breastfeed well and for longer. The duration of skills training should be 20-30 minutes to be effective.[13] This is a key clinical pathway towards successful and sustained EBF.

This study was designed to determine the effectiveness of the Breastfeeding Skills Training and Support Program (BSTSP) on breastfeeding self-efficacy and 6-month-exclusive breastfeeding among first-time mothers in a university hospital in northern Thailand.

Theoretical Framework

Pender's Health Promotion Model (HPM) was used as the theoretical framework for this study. The HPM focuses on the relationship among an individual's characteristics and experiences, behavior-specific cognition and affect, and behavioral outcomes.[14] According to the HPM, the individual characteristics and experiences are unmodifiable through nursing actions[14] but need to be controlled to determine the effect of the intervention on the outcomes. Therefore, only first-time mothers were chosen to be in this study.

Behavior-specific cognitions and affect are the most vital part of the HPM. They consist of perceived benefits, barriers and self-efficacy, activity-related affect, and interpersonal and situational influences related to the health behaviors of interest. These variables can be modified and can guide the interventions. The participants in this study learned about the benefits and possible problems of BF, and how to solve such problems. They were expected to have a positive attitude towards BF and high confidence to EBF for six months. Moreover, assistance, support, and encouragement from this program were expected to enhance the participants' perceived self-efficacy. Besides, offering the opportunity to their significant persons to learn about how to do BF support and encouragement to the participants is a way to establish positive interpersonal influences and activity-related effects. These activities can motivate mothers to breastfeed and provide good care for their infants. Telephone follow-up periodically to yield counseling for breastfeeding problems could help them to BF. However, the situational influence was not manipulated in this study because it was beyond the researcher's control. The behavioral outcome of this study was 6-months EBF. The following hypotheses were proposed:

1. The rate of EBF at six months of the mothers in the experimental group would be significantly higher than those in the control group.

2. BF self-efficacy mean scores at discharge and at six weeks in the experimental group would be significantly higher than those in the control group.

3. The effective suckling mean score of the mothers in the experimental group would be significantly higher than those in the control group.

Methods

Design: A randomized controlled trial (RCT).

Setting and Sample:

The setting was a university hospital in northern Thailand, and the sample was pregnant women who sought prenatal care and childbirth services at this hospital. Inclusion criteria were being: pregnant; age 18 years or more; at 36-37 weeks of gestational age; expected to have a first child as a singleton pregnancy; intending to breastfeed; having normal breasts and nipples; able to understand Thai; and contactable by phone. Exclusion criteria were having a contra-indication to BF; planning to have a cesarean section; unable to attend the entire program; undergoing a cesarean section during the program implementation; mother and infant were separated; and mother or the newborn developing health complications.

The sample size was estimated using power analysis, with a power of .80 and a significance level of .05.[15] The estimated effect size (0.67) was calculated from the previous study.[16] The sample size required was 35 per group. To compensate for the dropout rate, this study had determined an attrition rate of 15%. The total number of participants was 42 per group.

One hundred eligible potential participants were approached at the antenatal care unit (ANC), but three of them were unable to participate in all processes of this study due to lack of time. Therefore, 97 participants joined the study and were randomly assigned either to the experimental or the control groups using simple random sampling. This brought to 48 participants in the experimental and 49 in the control group. During the program implementation, seven participants in the experimental group were excluded due to cesarean birth and were separated from their infants. Seven participants in the control were excluded due to loss of contact, cesarean birth or separated from the babies. Therefore, 83 participants completed the program with 41 in the experimental group and 42 in the control group (**Figure 1**).

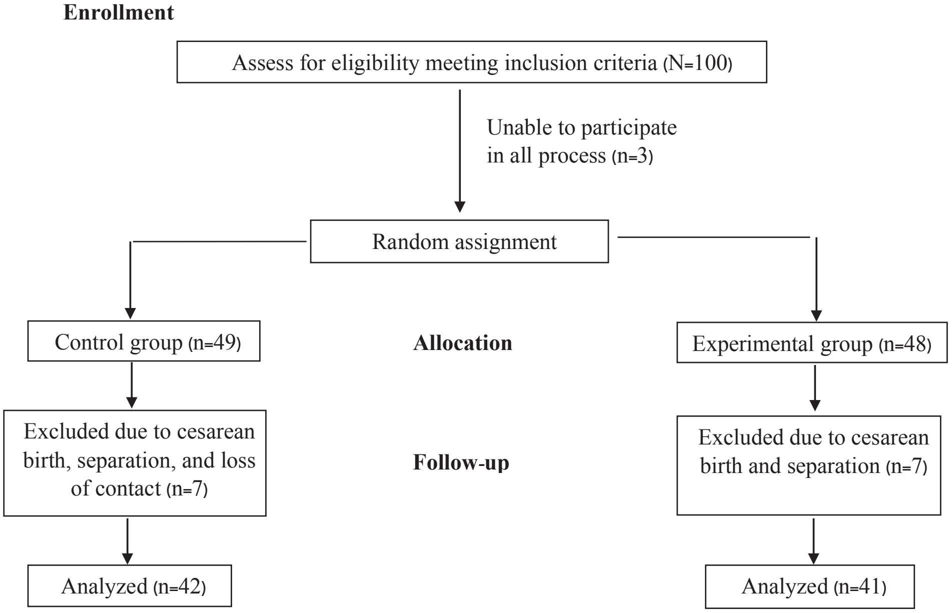

Figure1. Flow diagram of participants in a randomized controlled trial

Ethical Considerations

Study approval was obtained from the research ethics committees of the Faculty of Nursing, Mahidol University (COA No. IRB-NS2015/307.2109) and the Faculty of Medicine, Chiang Mai University (IRB No. 315/2015). All participants were informed of the study purpose and processes and their rights. When the women agreed to participate, they were asked to complete and sign a consent form.

Instruments: Four instruments were used for data collection – the Demographic Questionnaire, the Breastfeeding Self-Efficacy Scale-Short Form, the Effective Suckling Checklist, and the Food Record Form. The content validity of all instruments and the intervention program were reviewed by five experts: one nurse in the lactation clinic, one nurse instructor in pediatrics and three nurse instructors in obstetrics and gynecological nursing.

The Demographic Questionnaire was developed by the principal investigator (PI) to collect data on maternal age, marital status, educational level, occupation, family income, the sufficiency of income, family type, the person expected to help with childcare, date, time and type of delivery, baby's birth weight and gender.

The Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF) developed by Dennis[17] was translated into Thai by Thussanasupap.[18] It has 14-items and is self-administered. The participants were asked how confident they are with breastfeeding their new babies (e.g., "I can always determine that my baby is getting enough milk"). Each item is rated on a 5-point rating scale ranging from 1 (not at all confident) to 5 (very confident). Total scores range from 14 to 70, with higher scores indicating higher levels of BF self-efficacy. Cronbach's alpha coefficient of the BSES-SF Thai version used in Thussanasupap's study was 0.84[18], and 0.90 for this study.

The Effective Suckling Checklist was developed by the researchers, based on four key signs of good attachment[19] and literature review, and it is used to observe proper latch-on and effective suckling techniques. It consists of 10 items, and scoring is marked 1 for correct behavior and 0 for incorrect behavior. The score range between 0 and 10. The score of 8-10 refers to the effective suckling techniques while the lower the score the less effective the technique is considered to be. The CVI is 1.00 and the inter-rater reliability of the checklist was assessed by PI and one research assistant is 0.98.

The Food Record Form was developed by the researchers to monitor the kinds of food the infants received after hospital discharge. The PI used telephone calls to interview participants about food that the infants were fed, the age of infant in days when starting to receive other food and the reason that other food was given to the infants at Day 7, 1 month, six weeks, then at 3, 4, 5 and 6 months. The recorded data were summarized into two categories: EBF or not EBF. If the infant received water or any kind of complementary food the category of not EBF was given.

Intervention Program: The BSTSP includes providing BF knowledge, demonstrating and practicing BF skills, and providing BF support. BF knowledge includes benefits of BF, proper positioning for breastfeeding, effective suckling, common BF problems and how to prevent and resolve that problems, Then, participant were asked to watch 5-min VCDs concerning BF techniques, breast milk expression, and storage. This content and activities were divided into two sections. They were provided once a week for two consecutive weeks starts at 36-37 week of gestational age. After providing knowledge in each week, the PI allowed them to practice BF skills after the demonstration. The BF knowledge was expected to increase perceived benefits of BF, perceive less barrier to BF, and have positive attitudes toward BF. The BF skills would enhance the mother's confidence before facing the real situation.

Provision of BF support begins at day one, two, and three after delivery by encouraging participants to breastfeed their infants with the PI's assistance, helping with positioning and guiding to recognize the baby's feeding cues and signs of satiety. Providing the opportunity to the participant's significant persons to learn about BF support and to assist mothers and the baby. After going back home, the PI provides BF support continuously by telephone calls to monitor problems and provide counseling on day 7, and once a month until six months after birth. Sufficient and appropriate support from the researcher and family members were expected to increase the participants' BF self-efficacy and positive attitudes toward BF, leading to successfully EBF. Detail and implementation of the program is shown in **Table 1**

Table 1: Schedule and Content of BSTSP Intervention Protocol

Times and Purpose	Content/Activities
At ANC	
Session 1 (36-37 wks.)	
Purposes:	
: Enhancing perceived benefits of BF : Reducing perceived barriers to BF	- Providing knowledge and discussing the content on BF benefits, proper positioning and correct latch-on, BF problems, and solutions by using PowerPoint presentation. (10 minutes)
: Enhancing BF self-efficacy	- Showing VCD illustrated BF techniques produced by the Thai BF Center Foundation to participants with the researcher summarizes the main point of the BF techniques. (5 minutes)
: Enhancing BF self-efficacy : Developing positive activity related affect	- Demonstrating and BF practicing with details on correct latch-on and proper positions by using a life-size breast model and a baby doll. (30 minutes)
Session 2 (following week)	
Purposes:	
: Reducing perceived barriers to BF	- Providing knowledge and discussing the content of methods of hand expressing and storing breastmilk. Reviewing the knowledge of proper BF positioning and correct latch-on. (10 minutes)
: Enhancing BF self-efficacy : Reducing perceived barriers to BF	- Showing VCD illustrated hand expression and breast milk storage produced by the Thai BF Center Foundation to the participants. (5 minutes)
: Enhancing BF self-efficacy : Developing positive activity related affect	- Demonstrating and BF skills practicing with details on hand expression techniques and repeating BF skills practice on the correct latch-on and proper position. (30 minutes)
At postpartum unit	
Session 3 (within 24 hours after birth)	
Purposes:	
: Enhancing BF self-efficacy : Developing positive activity related affect	- Encouraging to breastfeed and providing assistance helping to adjust BF positions, giving advice and encouragement to ensure correct practice with strong verbal encouragement. - Providing the information about the baby's early feeding cues, and signs that the baby was satisfied at the end of the feeding.

Table 1: Schedule and Content of BSTSP Intervention Protocol (Cont.)

Times and Purpose	Content/Activities
: Enhancing social support	- Providing the opportunity to significant persons in the mothers' life learn how to BF support and encouraged to participate in practice in assisting mothers to breastfeed and take care of the infants.
Session 3 (day 2 after birth) Purposes: : Enhancing BF self-efficacy : Developing positive activity related affect : Enhancing social support	- Observing the participant breastfed and providing assistance helping to adjust BF positions, giving advice and encouragement to ensure correct practice with strong verbal encouragement. - Encouraging to begin hand expressing and providing assistance helping to ensure correct practice. - Encouraging the significant persons in the mothers' life practicing in assisting mothers and take care of the infants.
Session 5 (day 3 after birth) Purposes: : Enhancing BF self-efficacy : Developing positive activity related affect : Enhancing social support	- Observing the participant breastfed and providing assistance helping to adjust BF positions, giving advice and encouragement to ensure correct practice with strong verbal encouragement. - Encouraging the significant persons in the mothers' life practicing in assisting mothers and take care of the infants. - Reviewing the knowledge and skills and providing feedback for self-evaluation - Making an appointment for telephone call
At Home ***Session 6, 7*** (Evening of the discharge day, day 7 and 1 month after birth) Purpose: : Enhancing social support	- Telephone support for counseling about BF problems and the way to solve the problem, and monitoring the EBF (10-20 min for each call)
At Hospital ***Session 8*** (6 week after birth, the participants were routinely followed-up) Purpose: : Enhancing social support	- Counseling about BF problems and the way to solve the problem, and monitoring the EBF. (20 min)
At Home ***Session 9-12*** (3-6 month, once a month) Purpose: : Enhancing social support	- Telephone support for counseling about BF problems and the way to solve the problem, and monitoring the EBF (10-20 min. for each call)

Usual Care: Usual care refers to the routine care provided to pregnant women and postpartum mothers by the hospital staff and midwives. Midwives in the ANC inform pregnant women about healthy behaviors during pregnancy and the benefits of BF in one session by allowing them to watch the VCD. In the postpartum unit, midwives provide support for mothers and inform mothers about the techniques of BF and newborn care. They offer a group postnatal education session with the contents covering a variety of topics such as perineum care, breast care, activities and rest, family planning, expressing and storing breast milk.

Preparing the Research Assistants (RA): A registered nurse working at the postpartum unit was trained to assess effective suckling by the Effective Suckling Checklist.

Data Collection/Procedures

After the participants were assigned to either the experimental or the control group, they were asked to complete the demographic data questionnaire and the BSES-SF as baseline data. The experimental group was given usual care plus BSTSP while the control group received only usual care. Both groups were assessed for effective suckling and completed the BSES-SF before discharge and were assessed with the BSES-SF again at six-weeks when we met at the postnatal check-up clinic.They were also assessed regarding infant feeding by telephone as follow up on day 7, 1 month, and then each month until the sixth month or after stopping EBF in order to determine EBF or not EBF.

Data Analysis

The Shapiro-Wilk test was used to determine the normality of the numerical variables. Descriptive analysis was used to evaluate demographic data. The chi-square test, independent t-test, and Fisher's exact test were used to examine the differences of sample characteristics between the control and experimental groups. The difference in the EBF rate at six months between the two groups was analyzed using the Chi-square test. The Mann-Whitney U-test was used to compare the duration of EBF, the BF self-efficacy scores, and the effective suckling score between the two groups, due to EBF duration, the BF self-efficacy scores, and the effective suckling score did not have a normal distribution.

Results

There were no statistically significant differences in demographic characteristics between the two groups (**Table 2**). After the receiving the BSTSP, the number of mothers who exclusively breastfed for the first six months in the experimental group [15 (36.6%)] was significantly higher than those in the control group [6 (14.3%)]. The average EBF duration of the mothers in the experimental group (131.33 days) was significantly longer than that in the control group (73.31 days) (**Table 3**).

At baseline, no significant difference was found in the average BF self-efficacy scores at between groups. However, the average BF self-efficacy scores at discharge and six weeks in the experimental group was significantly higher than the control group (**Table 3**). In the experimental group, the BF self-efficacy scores increased with time, while the control group decreased at discharge and then increased at 6 weeks (**Table 3**). It was also found that the average effective suckling scores in the experimental group were significantly higher than the control group (**Table 3**).

Table 2: Demographic characteristics of study participants

Characteristics	Experimental group (N=41)		Control group (N=42)		p
	n	%	n	%	
Age (years)					
20-24	8	19.5	11	26.2	.466[a]
25-29	19	46.5	20	47.6	
30-34	10	24.4	5	11.9	
≥ 35	4	9.8	6	14.3	
Mean (SD)	27.90 (4.60)		27.10 (4.70)		.436[c]
Min-Max	20-41		20-37		
Marital status					
Married	41	100.0	41	97.6	NS[b]
Separated/Widowed/Divorced	-	-	1	2.4	
Education					
≤ High school	7	17.1	12	28.6	.459[a]
Diploma	10	24.4	9	21.4	
≥ Bachelor's degree	24	58.5	21	50.0	
Occupation					
Employee	20	48.8	25	59.5	.222[b]
Government Official	6	14.6	3	7.1	
Vendor	3	7.3	7	16.7	
Homemaker	12	29.3	7	16.7	
Family income (Baht/month; 32 Baht = 1 USD)					
< 20,000	10	24.4	17	40.5	.232[a]
20,000-29,999	14	34.1	9	21.4	
≥ 30,000	17	41.5	16	38.1	
Mean (SD)	26,024.40 (10,607.00)		22,268.81 (8,230.69)		.075[c]
Min-Max	10,000-50,000		10,000-40,000		
Sufficiency of income					
Sufficient	23	56.1	20	47.60	.469[b]
Sufficient with no savings	17	41.50	18	42.90	
Insufficient	1	2.40	4	9.50	
Family Type					
Nuclear family	19	46.30	26	61.90	.155[a]
Extended family	22	53.70	16	38.10	
Personal support					
Husband	4	9.80	8	19.00	.277[a]
Own mother and husband	31	75.60	25	59.50	
Husband's mother and husband	6	14.60	9	21.50	

Note: a= Chi-square; b= Fisher's exact test; c= t-test, NS= non-significant with $p > .999$

Table 2: Demographic characteristics of study participants (Cont.)

Characteristics	Experimental group (N=41)		Control group (N=42)		p
	n	%	n	%	
Mode of delivery					
Normal delivery	39	95.10	33	78.60	.078[b]
Forceps extraction	–	–	3	7.1	
Vacuum extraction	2	4.90	6	14.30	
Sex of infant					
Male	17	41.50	23	54.80	.470[a]
Female	24	58.50	19	45.20	
Weight of infant (gram)					
2000-2499	2	4.90	5	11.90	.506[b]
2500-2999	16	39.00	18	42.90	
3000-3499	17	41.50	16	38.10	
≥ 3500	6	14.60	3	7.10	
Mean (SD)	3,099.40 (361.40)		2,985.36 (360.19)		.154[c]
Min-Max	2,360-3,810		2,290-3,670		

Note: a= Chi-square; b= Fisher's exact test; c= t-test, NS= non-significant with $p > .999$

Table 3: Comparison of the EBF rate, the EBF duration, the BSES, and ESS between the experimental and the control groups

Variables	Experimental group (N=41)	Control group (N=42)	*p*
BF at six months, n (%)			
EBF	15 (36.60)	6 (14.30)	.011[a]
Non-EBF	26 (63.40)	36 (85.70)	
Duration of EBF (days)			
Min - Max	7 - 180	3 - 180	
Mean (SD)	131.33 (56.66)	73.31 (63.87)	
Median (IQR)	150.00 (90.00)	72.50 (110.00)	< .001[b]
BSES at baseline			
Min - Max	35 - 66	34 - 64	
Mean (SD)	51.55 (8.36)	52.64 (6.86)	
Median (IQR)	52.00 (10.25)	53.50 (7.50)	.585[b]
BSES at discharge			
Min - Max	37 - 64	32 - 62	
Mean (SD)	52.22 (8.16)	47.97 (5.68)	
Median (IQR)	54.00 (12.50)	48.00 (6.00)	.011[b]
BSES at 6 weeks			
Min - Max	34 - 69	20 - 68	
Mean (SD)	58.73 (8.56)	51.21 (11.25)	
Median (IQR)	60.00 (12.00)	53.00 (14.00)	.001[b]
ESS at discharge			
Min - Max	9 - 10	5 - 10	
Mean (SD)	9.66 (0.48)	7.26 (1.23)	
Median (IQR)	10 (1)	7 (2)	< .001[b]

Note: a= Chi-square; b= Mann-Whitney U-test; BF=breastfeeding; EBF= exclusive breastfeeding; BSES= breastfeeding self-efficacy scores; ESS= effective suckling scores.

Discussion

The BSTSP was successful in promoting the EBF for 6 months among first-time mothers. Moreover, the EBF duration was longer in the experimental group than that in the control group. According to HPM, the BSTSP could enhance 6-month EBF rate and EBF duration through the set of variables for behavior-specific cognitive and affect; perceived benefits, perceived barriers, perceived self-efficacy, activity-related affect, and interpersonal influences. The participants in the experimental group obtained knowledge and information about the benefits of BF, possible problems and guidelines for solving breastfeeding problems. Moreover, they practiced how to properly position the baby to have effective suckling. Therefore, the capability to perform effective BF was developed (an average effective suckling scores in the experimental group =9.66 ± .48, while in the control group =7.26 ± 1.23). Consistent with previous studies educating mothers regarding the benefits of BF and assisting them to practice breastfeeding and problem-solving skills can help them to extend the BF duration and increase EBF rates.[20, 21, 22]

Therefore, training mothers for proper lactation can help mothers understand clearly and practice breast feeding correctly, and is the key to sustained EBF.[23] The BSTSP provides social support and breastfeeding assistance to the participants after giving birth and can help them to breastfeed effectively and reduces BF barriers. Moreover, effective breastfeeding can stimulate prolactin and oxytocin in secretion to produce and release more milk. Such mechanisms would help to ensure sufficient milk for their babies.[24] If mothers can breastfeed smoothly with enough breast milk, it enhances positive attitude towards BF and also increases BF self-efficacy leading to sustained EBF until 6 months.[25, 26]

The BSTSP could enhance self-efficacy through three influential sources of self- efficacy, namely, enactive mastery experiences, verbal persuasion, and emotional or physical arousal. Enactive mastery experiences were enhanced by practicing the common BF positions and attachments during the prenatal period and providing support during the initiation of BF leading to increased BF self-efficacy.[27] Verbal persuasion was enhanced by providing moral support, encouragement and reflective comment to build the mother's confidence. Emotional or physical arousal was enhanced by providing anticipatory guidance about normal physiological changes, cope with anxiety, and how to interpret baby cues which increased their confidence to breastfeed. Therefore, the BF self-efficacy scores of the experimental group were significantly higher than those in the control group. In accordance with the previous study, the level of BF self-efficacy scores in the intervention group higher than those in the control group.[28] Moreover, mothers with higher BF self-efficacy scores had a long duration of EBF than those with lower BF self-efficacy scores.[29]

Limitations of the Study

The implementation was time-consuming and required considerable cooperation from nurses in the ANC and postpartum units. Moreover, the situational influence was not manipulated. Therefore, this may be considered a study limitation. In addition, this program was only implemented in a tertiary hospital in northern Thailand, so the results may not represent the entire population.

Conclusions and Implications for Nursing Practice

First-time mothers who participated in this program had a significantly higher rate of EBF for six months and increased BSES at discharge and at six weeks. It may be concluded that this program was effective in promoting EBF for six months and enhancing BF self-efficacy. Therefore, nurses and midwives can integrate this theory-based intervention program into the regular services of a hospital or in community healthcare at every stage from pregnancy to the postpartum period to promote 6- month EBF. However, further testing of the program is warranted to ensure that it is context and culture specific with different Thai populations. Especially, a skills training session can help convey to new mother the proper breastfeeding positioning and attachment which influence breastfeeding self-efficacy and appear to encourage them to persist with EBF for six months.

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References

1. World Health Organization. Infant and young child feeding [Internet] 2018. [cited 2018 June 20]. Available from: http://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding.
2. Office of the National Economic and Social Development Board, Office of the Prime Minister. The twelfth national economic and social development plan (2017-2021) [internet] 2018. [cited 2018 July 20]. Available from: https://www.nesdb.go.th/nesdb_en/ewt_w3c/ewt_dl_link.php?nid=4345.
3. Lumbiganon P, Martis R, Laopaiboon M, Festin MR, Ho JJ, Hakimi M. Antenatal breastfeeding education for increasing breastfeeding duration. Cochrane Database Syst Rev. 2016; 12:CD006425.
4. Skouteris H, Nagle C, Fowler M, Kent B, Sahota P, Morris H. Interventions designed to promote exclusive breastfeeding in high-income countries: a systematic review. Breastfeed Med. 2014; 9(3): 113-27.
5. Meedya S, Fernandez R, Fahy K. Effect of educational and support interventions on long-term breastfeeding rates in primiparous women: a systematic review and meta-analysis. JBI Database System Rev Implement Rep. 2017; 15(9): 2307-32.
6. UNICEF. Infant and young child feeding [internet] 2018 [cite 2019 Feb 15]. Available from: https://data.unicef.org/topic/nutrition/infant-and-young-child-feeding/.
7. World Health Organization. Exclusive breastfeeding under 6-months data by country [Internet] 2018. [cited 2019 Feb 15]. Available from: http://apps.who.int/gho/data/view.main.NUT1730.
8. Buttham S, Kongwattanakul K, Jaturat N, Soontrapa S. Rate and factors affecting non-exclusive breastfeeding among Thai women under the breastfeeding promotion program. Int J Womens Health. 2017; 9: 689-694.
9. Thepha T, Marais D, Bell J, Muangpin S. Perceptions of northeast Thai breastfeeding mothers regarding facilitators and barriers to six-month exclusive breastfeeding: focus group discussions. Int Breastfeed J. 2018; 13:14.
10. Prasopkittikun T, Sangperm P. Self-efficacy promoting interventions for breastfeeding outcomes: an integrative review of research conducted in Thailand. Pacific Rim Int J Nurs Res. 2017; 21(1): 44-58.
11. Sun K, Chen M, Yin Y, Wu L, Gao L. Why Chinese mothers stop breastfeeding: Mothers' self-reported reasons for stopping during the first six months. J Child Health Care. 2017; 21(3): 353-63.
12. Sheeran L, Buchanan K, Welch A, Jones LK. Women's experiences of learning to breastfeed. Breastfeed Rev. 2015; 23(3):15-22.
13. de Jesus PC, de Oliveira MI, Fonseca SC. Impact of health professional training in breastfeeding on their knowledge, skills, and hospital practices: a systematic review. J Pediatr (Rio J). 2016; 92(5): 436-50.
14. Pender N, Murdaugh C, Parsons MA. Health promotion in nursing practice (6th ed.). Upper Saddle River, New Jersey: Pearson Education, Inc; 2011.
15. Sullivan ML. Essentials of biostatistics in public health (2nd ed.). MA: Jones and Bartlett Publishers; 2011.
16. Kupratakul J, Taneepanichskul S, Voramongkol N, Phupong V. A randomized controlled trial of knowledge sharing practice with empowerment strategies in pregnant women to improve exclusive breastfeeding during the first six months postpartum. J Med Assoc Thai. 2010; 93(9): 1009-18.
17. Dennis C. The breastfeeding self-efficacy scale: psychometric assessment of the short form. J Obstet Gynecol Neonatal Nurs. 2003; 32(6):734-744.

18. Thussanasupap B. The effects of systematic instructional program on breastfeeding self-efficacy, nipple pain, nipple skin changes and incision pain of cesarean mothers (Unpublished master's thesis) Mahidol University, Bangkok. 2006.
19. UNICEF. The community infant and young child feeding counselling package [internet] 2012 [cited 2017 Sep 10]. Available from: https://www.unicef.org/nutrition/files/counseling_cards_Oct._2012small.pdf.
20. Ahmadi S, Kazemi F, Masoumi SZ, Parsa P, Roshanaei G. Intervention based on BASNEF model increases exclusive breastfeeding in preterm infants in Iran: a randomized controlled trial. Int Breastfeed J. 2016; 11:30.
21. Hatamleh W. Prenatal breastfeeding intervention program to increase breastfeeding duration among women Health. 2012; 4(3): 143-9.
22. Manal IH, Sherein AH, F, Hend E. Impact of health education on knowledge of, attitude to and practice of breastfeeding among women attending primary health care in Almadinah Almunawwarah, Kingdom of Saudi Arabia: Controlled pre-post study. 2014; 9(3): 187-93.
23. Prabha, Saha I, Nandy S. A study on feeding practice of under 6 month infants attending the nutrition clinic of a tertiary care hospital of West Bengal, India. Epidemiol Biostat Public Health. 2013; 10(2): e89471- 6.
24. Kent JC, Prime DK, Garbin CP. Principles for maintaining or increasing breast milk production. J Obstet Gynecol Neonatal Nurs. 2012; 41(1):114-21.
25. Mbada CE, Olowookere AE, Faronbi JO, Oyinlola-Aromolaran FC, Faremi FA, Ogundele AO, et al. Knowledge, attitude and techniques of breastfeeding among Nigerian mothers from a semi-urban community. BMC Res Notes. 2013; 6:552.
26. Schafer EJ, Campo S, Colaizy TT, Mulder PJ, Breheny P, Ashida S. First-time mothers′ maintenance of experiences and changes in maternal perceptions. Public Health Nutr. 2017; 20(17):3099-108.
27. Troutman B, Moran TE, Arndt S, Johnson RF, Chmielewski M. Development of parenting self-efficacy in mothers of infants with high negative emotionality. Infant Ment Health J. 2012; 33(1).
28. Loke AY, Chan LK. Maternal breastfeeding self-efficacy and the breastfeeding behaviors of newborns in the practice of exclusive breastfeeding. J Obstet Gynecol Neonatal Nurs. 2013; 42(6):672-84.
29. Ansari S, Abedi P, Hasanpoor S, Bani S. The effect of program on breastfeeding self-efficacy and duration of exclusive breastfeeding in pregnant women in Ahvaz, Iran. Int Sch Res Notices. 2014; 2014:510793.

ประสิทธิผลของโปรแกรมการฝึกทักษะและสนับสนุนการเลี้ยงลูกด้วยนมแม่ในมารดาที่บุตรคนแรก: การทดลองแบบสุ่ม

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บทคัดย่อ: ปัญหาของการเลี้ยงลูกด้วยนมแม่ในมารดาครรภ์แรกส่วนใหญ่เกิดจากท่าในการอุ้มลูกดูดนมไม่ถูกวิธี การศึกษาแบบทดลองนี้มีวัตถุประสงค์เพื่อศึกษาผลของโปรแกรมการฝึกทักษะและสนับสนุนการเลี้ยงลูกด้วยนมแม่ต่ออัตราการเลี้ยงลูกด้วยนมแม่อย่างเดียว 6 เดือนในมารดาที่คลอดบุตรคนแรกในโรงพยาบาลมหาวิทยาลัยแห่งหนึ่งทางภาคเหนือของประเทศไทย กลุ่มตัวอย่างได้รับการสุ่มเข้ากลุ่มทดลอง (44 คน) และกลุ่มควบคุม (42 คน) กลุ่มทดลองได้รับโปรแกรมการฝึกทักษะเลี้ยงลูกด้วยนมแม่ร่วมกับการสนับสนุนและการพยาบาลตามปกติ กลุ่มควบคุมได้รับการพยาบาลตามปกติ เก็บรวบรวมข้อมูลโดยใช้แบบสัมภาษณ์ข้อมูลส่วนบุคคล แบบสอบถามการรับรู้สมรรถนะแห่งตนในการเลี้ยงบุตรด้วยนมมารดา แบบประเมินประสิทธิภาพการดูดนม และแบบบันทึกการให้อาหารทารก วิเคราะห์ข้อมูลด้วยสถิติเชิงพรรณนา สถิติไค สแควร์ และสถิติแมน-วิทนีย์ ยู

ผลการศึกษาพบว่าอัตราการเลี้ยงลูกด้วยนมแม่อย่างเดียว 6 เดือนในกลุ่มทดลองสูงกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ คะแนนเฉลี่ยการรับรู้สมรรถนะแห่งตนในการเลี้ยงบุตรด้วยนมมารดาในวันจำหน่ายออกจากโรงพยาบาล และ 6 สัปดาห์หลังคลอดของกลุ่มทดลองสูงกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติ จากผลการศึกษามีข้อเสนอแนะว่าควรนำโปรแกรมนี้ไปทดลองใช้กับประชากรกลุ่มอื่นๆ

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คำสำคัญ: การเลี้ยงลูกด้วยนมแม่ มารดา ระยะตั้งครรภ์ ระยะหลังคลอด การรับรู้สมรรถนะแห่งตนในการเลี้ยงบุตรด้วยนมมารดา

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Factors Predicting Stroke Pre-hospital Delay Behavior Intention among People with High Risk of Stroke

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Abstract: Recombinant tissue plasminogen activator has been recommended and widely used in treating acute ischemic stroke. Unfortunately, the critical period for medical effectiveness is relatively short, and many people with stroke cannot access a hospital in time. This study aimed to determine factors predicting stroke pre-hospital delay behavior intention among people with high risk of stroke. In this cross-sectional study, people with high risk of stroke and their family members (n = 93 pairs) were recruited from a semi-rural province in central Thailand. The questionnaires used in this study included socio-demographic, dependency, stroke literacy, family relationship, and stroke pre-hospital delay behavior intention scales. Data were analyzed using descriptive statistics, Pearson's product-moment correlation coefficient, and multiple regressions.

The results revealed that dependency, number of family members, stroke literacy and family members' stroke literacy were negatively correlated with stroke pre-hospital delay behavior intention among people with high risk of stroke. The latter was positively correlated with family members' stroke pre-hospital delay behavior intention. In a regression analysis, the family members' stroke pre-hospital delay behavior intention, stroke literacy, and dependence collectively accounted for 58.2% of stroke pre-hospital delay behavior intention. The findings suggest that nurses can develop an intervention to decrease stroke pre-hospital delay behavior intention by increasing stroke literacy of both people with high risk of stroke and family members, and promptly ask for help (dependency). These actions may help facilitate people to receive timely medical treatment.

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Introduction

Stroke is the second leading cause of death worldwide,[1] and in Thailand, the site of this study men have a higher death rate and a slightly higher rate of long-term disability from stroke.[2] Data from the Ministry of Public Health for 2011-2015 showed the stroke mortality rate increasing dramatically

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(30.0, 32.0, 35.1, 38.0 and 43.5 per 100,000 population, respectively).[3,4] A previous study estimated that at least one new stroke occurs in Thailand every 2 minutes.[5] Additionally, the Thai Epidemiology Stroke Study found the prevalence of stroke in populations over the age of 45 years was 1.9%.[4] Stroke prevalence differed among five geographic regions of the country with the Bangkok Metropolitan area having the highest prevalence followed by Thailand's central region.[4]

Empirical evidences[6-7] consistently support thrombolysis treatment with recombinant tissue plasminogen activator [rt-PA] as one of the most biologically active therapies for acute ischemic stroke. However, the efficacy time window for the drug decreases dramatically while the risk of complications, such as intracranial hemorrhage and death, increases with passing time. Recent studies demonstrated that deaths increase when treatment is started more than 4.5 hours after initial symptoms.[6-7] These findings highlight the fact that the number of people receiving early treatment and could potentially benefit from this remains small. For the years 2010-2015, stroke centers using rt-PA within the potentially beneficial period reached only about 5% of people with stroke in developed countries[7] and about 1.1 - 3.8% in Thailand.[2,5] The primary reason for the exclusion of thrombolysis treatment was pre-hospital delays.[8-10]

Pre-hospital delays [PHD] refer to people arriving at a stroke unit after >180 minutes.[11] Thai stroke guideline committees also proposed that any suspected stroke case needs to reach a stroke unit within 3 hours and 1.5 hours more are needed for investigation and treatment preparation.[11] During the years 2013-2016, several studies in Thailand revealed the time until hospital arrival among people with acute stroke ranged from 50 - 301 minutes.[12-15]

To decrease PHD, it is necessary to understand stroke pre-hospital delay behavior intention [SPDBI] to seek health care and the association of factors among people with a high risk of stroke. SPDBI is defined as the subjective probability of participants or family members engaging in delayed treatment from the time of stroke symptom appearance to reaching a hospital without providing stroke fast track.[16] The decision delay is believed to occur from the lack of awareness regarding stroke symptoms and the hesitation to call the EMS[17] and how people make sense of symptoms and their level of motivation to seek help.[18] Yang and colleagues[19] suggested that to decrease SPDBI, improve knowledge, and enhance stroke pre-symptoms alert can reduce the possibility of PHD. Since positive intention is a mobilizer of proper actual behavior. As the time of hospital arrival is vital for decisions about stroke treatment, it is crucial that people with high risk of stroke (PWHRS) and bystanders need to know about, immediately decide, and act promptly when there is a stroke event.[10-11]

Eventually, most studies have emphasized after-stroke care and time delay in seeking help. Little is known about factors influencing SPDBI, early detection when stroke symptoms occur, and about assessing the probability of a PHD. Therefore, SPDBI and factors predicting behaviors among PWHRS and family members/bystanders need to be further explored.

Review of Literature and Conceptual Framework

Previous studies have focused on judging whether there is a delay time from stroke onset to hospital registration and related factors.[13-5, 17-20] There is limited literature about SPDBI which might help to understand the issues about actual delay behaviors. A pre-hospital delay is related to various factors; and delays en route to the hospital can be divided into three levels on the acute stroke pathway: primary, secondary and tertiary delays.[17-21] Primary delays include a lack of recognition of stroke or serious symptoms or a lack of response to these symptoms. Previous evidence suggests that a delay in seeking medical attention after the onset of stroke symptoms is an important reason for underuse of thrombolytic therapy.[12,17] Some studies show that many PWHRS do not realize stroke dangers,[14-15,17] feel anxious when symptoms occur,[12,13] or feel afraid of what will ensue when the symptoms appear.[13] And these feelings can lead to a lack of adherence to preventive treatment and delay in calling for help. The majority of the patients not adhering to treatment and seeking healthcare services in time had knowledge deficits about the causes, signs, and symptoms, and need for early treatment and care.[17-18, 20-22] Secondary delays included initial contact with non-emergency health services.[8,15,20] Previous studies showed that people with suspected stroke stopped at primary care facilities first, which led to more delay in reaching a potential hospital.[20] Other studies revealed that living with others was strongly associated with the early calling of Emergency Medical Services [EMS], leading to a decreased arrival time to reach a hospital.[8,17,23] Lastly, a tertiary delay means that patients' presenting symptoms often are not diagnosed properly by a health service provider, leading to increased time in reaching a hospital.[8, 23]

In summary, several complex factors are associated with the delay of people with suspected stroke arriving at a hospital and these are considered stressors. These factors indicate the need for a framework that considers the influence of multi-level factors to formulate an understanding of PHD among PWHRS. The Neuman System Model [NSM][24] can be used to guide the selection of variables for complex problems and was applied as the conceptual framework in this study. The NSM provides a systematic perspective to assess all stressors including intrapersonal, interpersonal and extrapersonal stressors in five areas: physiological, psychological, sociocultural, developmental, and spiritual. The selected variables included physiological variables (stroke literacy), psychological variables (dependency), sociocultural variables (community participation, and living conditions), developmental variables (age and educational level), and spiritual variables (religious ritual). Moreover, interpersonal stressors selected for this research included: family members' stroke pre-hospital delay behavior intention, family members' stroke literacy, and family relationship.

The major problem is that people with suspected stroke arrive at a hospital late and no longer meet the criteria for rt-PA treatment. The five variables of people and environmental stressors might influence SPDBI. Those selected variables were tested for their relation to and predictiveness for SPDBI of the PWHRS in this research.

Study Aim

To determine factors predicting stroke pre-hospital delay behavior intention among people with high risk of stroke.

Methods

Design

A cross-sectional, correlational research design was employed.

Setting

The setting was a selected district with five sub-districts, in a semi-rural province in central Thailand (about 60 kilometers from Bangkok), with a population of 880,692 people within 170,198 households.[25] There was a higher stroke mortality rate than the average in the whole Kingdom of Thailand.[3,25] Moreover, the stroke morbidity rate in this setting was at the 9th highest prevalence in Thailand.[25] Therefore, PWHRS were recruited from these communities.

Participants

The sample size was based on the calculation for multiple regression.[26] This study's sample was estimated based on ten independent variables as possible predicting factors, an acceptable level of power of 0.95, the important criterion of $p<0.05$, and an effect size of 0.35. The sample size required was 80 participants. For family members, the sample size also evened and paired. At the end of the year 2016, 957 of 1,026 people with hypertension or diabetes in the research area underwent stroke screening by the government project. A total of 112 of 957 PWHRS were identified by the risk prediction chart developed by the Thai CV Risk Score Development Group[27] which laid out the risk levels of individuals by gender, age, systolic blood pressure, total blood cholesterol, smoking status and present or absence of diabetes mellitus. It expressed risk using a color chart with green, risk of <10%; yellow, risk of 10-20%; orange, risk of 20-30%; red, risk of 30-40%; and deep red, risk >40%. In this study, a population of PWHRS (N = 112), risk ≥ 30%, was recruited during February - March 2017. However, 19 PWHRS were excluded from the study because of contact limitations or response conditions. Finally, the participants were 93 PWHRS and their paired 93 family members. The extra 13 participants (16.3 % of the total participants) were included to offset any missing subjects.

Inclusion criteria for PWHRS were as follows: 1) individuals diagnosed with hypertension or diabetes, who had been identified as high risk of stroke 2) able to communicate in the Thai language, and 3) aged ≥ 18 years old. For family members, inclusion criteria were as follows: 1) be a sibling or offspring, spouse, employee or other significant people for the participants who provide any physical and/or emotional care for the participants or spend time with the participants; 2) able to communicate in Thai language; and 3) aged ≥ 18 years old.

Exclusion criteria of PWHRS were as follows: 1) those sick from a stroke at the beginning of the research; 2) a history of comorbidity with uncontrolled heart disease, active renal failure, or other active diseases; and 3) did not stay in the research setting during the research period. For family members, the exclusion criterion included individuals who were absent from the research setting during the research period.

Ethical Considerations

Approval was obtained from the Ethical Committee of the Faculty of Public Health, Mahidol University (MUPH 2016-138). The potential participants were informed of the purpose of the study and also told about their right to withdraw from the study at any time without losing any benefits of their health care services. The signed consent was obtained from all participants after they agreed to participate.

Instruments

There were five instruments which were administered in Thai: 1) socio-demographic questionnaire; 2) Dependency scale; 3) Stroke literacy scale for PWHRS or family members; 4) A family relationship scale, and 5) The Stroke Pre-hospital Delay Behavior Intention Scale for PWHRS or family members.

The researchers developed the first 3 instruments using a literature review to inform their development. The content validity of dependency scale, stroke literacy scale for PWHRS or family members were verified by seven experts including four academic stroke experts, one physician, and two measurement experts. The CVI of the two newly developed instruments, the internal consistency reliability of all instruments except the Socio-demographics Questionnaire were tested with PWHRS and their family members (n = 30 pairs). All values of each measure of try out and of actual reliability are shown in **Table 1**.

Table 1 Psychometric properties of the instruments

Variables	CVI	IOC	KR-21*		Cronbach's alpha reliability	
			Pre-test	Actual	Pre-test α	Actual α
1. PWHRS' socio-demographics		0.92	-	-	-	-
2. Family members' socio-demographics	-	0.84	-	-	-	-
3. PSPDBI	0.86	-	-	-	0.87	0.90
4. FSPDBI	0.91	-	-	-	0.87	0.88
5. PSL	-	0.92	0.89	0.87	-	-
6. FSL	-	0.95	0.90	0.90	-	-
7. Dependency	0.93	-	-	-	0.87	0.89
8. FR	0.98	-	-	-	0.84	0.88

Note. * = Kuder – Richardson's method,
IOC = Index of Item-Objective Congruence, CVI = Content Validity Index
PSPDBI = PWHRS' stroke pre-hospital delay behavior intention,
FSPDBI = Family members' stroke pre-hospital delay behavior intention,
PSL = PWHRS' stroke literacy, FSL = Family members' stroke literacy,
FR= Family relationship,

The Socio-demographics Questionnaire. The questions focus on variables such as age, gender, underlying disease, education level, number of people living in the household, the family's economic status, community participation and frequency of community activities per month, and practice of religious rituals. For religious observance, the questions asked how often participants have a solely religious activity per week.

The Dependency Scale. This is a 10-item Likert-style self-report measuring psychological dependence/detachment when respondents get sick with chronic diseases. It contains a series of statements focusing on perceived discomfort or guilt when receiving help from someone else and privacy needs. The scale had two subscales: 5 items evaluated perceived discomfort or guilt when receiving help from someone else and five items measured privacy needs. Responses to the positive items ranged from 5 (strongly true) to 1 (not true). Rating scores are reversed for negative items. The total score ranges from 1- 50 with a higher score indicating a higher dependency. A score of 1.0 - 29.9 (0 - 59.9%)[28] means a low level of dependence, whilst 30.0 - 39.9 (60 - 79.9%)[28] equates to a moderate level of dependency, and a score of 40.0 - 50.0 (80 - 100.0%)[28] is a high level of dependency.

The Stroke Literacy Scale [SLS]. This is a comprehensive self-report instrument focused on two areas: knowledge about stroke, and awareness on immediate actions to stroke events. The knowledge area consists of 46 items with a scoring of "incorrect" = 0, and "correct" = 1. It includes risk factors (15 items), basic pathology (1 item), signs and symptoms (12 items), management (3 items), health insurance (1 item), and stroke prevention (14 items). Awareness of immediate actions to stroke events consist of 10 items using a 3-Likert scale of 0 (disagree) to 2 (agree). There are two sets of the SLS for PWHRS [PSL] and family members [FSL]. For example, for the PWHRS, a question is: "What will you do if you observe any signs and symptoms of stroke occurring?" For family members, the question is "What will you do if you observe a family member having any signs and symptoms of stroke. Total scores of both questionnaires range from 0 - 66, with a higher score indicating higher stroke literacy [SL]. A score of 0.0-39.5 (0 - 59.9%)[28] means a low level of SL, 39.6 - 52.7 (60 - 79.9%)[28] a moderate level of SL, and a score of 52.8 - 66.0 (80 - 100.0%)[28] is considered a high level of SL.

Family Relationship Scale [FRS]. The FRS is a comprehensive self-report instrument. The instrument was adapted from Waelveerakup, Thumapiroj, and Suwannasarn in 2012.[29] It consists of 20 items with five sub-domain: joining in activities, communication, love and attachment, encouragement and support, and mutual understanding related to relationships in caring for those with chronic illness. Total scores range from 0 - 40 with a higher score indicating higher family relationship [FR]. A scores of 0.0 - 23.9 (0 - 59.9%)[28] means a limited level of FR, while 24.0 - 31.9 (60 - 79.9%)[28] is a moderate level of FR, and 32.0 - 40.0 (80 - 100.0%)[28] is considered a strong FR.

The Stroke Pre-hospital Delay Behavior Intention Scale (SPDBI). This instrument is used to measure decision making or judgment and the action of patient or family that is an obstacle to people with stroke receiving rt-PA treatment in time. The scale assesses the possibility of a PHD if stroke symptoms occur.[16] The SPDBI-Thai version was modified to fit within the Thai context from the SPDBI, developed by Zhao and colleagues[16] with permission. It was translated into Thai and back-translated into English for comparison of validity. The original scale has 27 items with five sub-domains including stroke warning signs (9 items), non-treatment justification (8 items), alternative treatment (4 items), habitual response style (3 items), and emergency system use (3 items). Part I of the original scale was deleted because of its replication with the SLS. The adapted SPDBI version consists of 18 items with four sub-domains of non-treatment justification, symptom attributions, habitual response style, and emergency system use. There are also two sets of SPDBI, one each for PWHRS [PSPDBI] and family members [FSPDBI]. Scores range from 18 - 90 with higher score indicating higher stroke pre-hospital delay behavior intention.[16] The score of 18.0 - 53.9 (0 - 59.9%)[28] means a low level of SPDBI, while 54.0 - 71.9 (60 - 79.9%)[28] is a moderate level, and 72.0 - 90.0 (80 - 100.0%)[28] is a high level.

Data Collection

Data was collected during February - March 2017. Five research assistants were recruited from village health volunteers at selected communities. They were trained by the researchers how to collect the data and procedures for human rights protection. For those participants who could not read, the questionnaires were read out by the principal investigator (PI) or research assistants with the participants listed and answers given to the researcher or assistants.

Data Analysis

Data were entered, verified, and cleaned using Microsoft Excel and analysis undertaken using the SPSS statistics program, 18th version. The adopted level of statistical significance was $p < 0.05$. Descriptive statistics were used to describe the socio-demographics of the participants. Pearson's product-moment correlation coefficient was used to explore the relation between dependent and independent variables. Finally, multiple regressions were performed to examine the predictive relationship between the dependent variable and independent variables.

Results

For PWHRS, most participants were female. Participants' ages ranged from 42 to 90 years with a mean age of 72.98 years. All participants were diagnosed with hypertension and a history of comorbidity. Most (82.7%) had an education at the primary school level. The mean year of formal education was 7.18 years. All participants were Buddhist. Participants' religious ritual practice ranged from 0 to 4 times per week with a mean frequency of 1.86 times. The number of people living in the household was from 2 to 12 persons with a mean of 4.73 persons. The frequency of participation in community activities ranged from 0 to 10 times per month with a mean of 1.14 times (Table 2).

The total score of PSPDBI were at a low level (Table 3). The PWHRS reported that they will take some time to wait and see before making a decision for action (53.6%), take a rest (51.6%) or take their own medicines (48.4%) and go to have a massage or acupuncture (31.2%) if they have any doubt about any symptoms.

For family members, most participants were female and about half (48.4%) were either daughters or sons. Participants' ages ranged from 18 to 53 years with a mean age of 32.83 years. About two-thirds of family members (67.7%) had education at primary level. The socio-demographic variables of the participants are shown in **Table 2.**

The Pearson correlation showed that the number of family members, dependency, PSL, and FSL inversely correlated with PSPDBI whereas FSPDBI was positively correlated with PSPDBI. Nonsignificant factors that correlated with PSPDBI were community participation, education level, religious ritual, and FR (Table 4).

Multiple linear regression analyses were used to determine the extent to which the group of independent variables taken together predicted PSPDBI. In the first model, FSPDBI was included and could account for 40.1% of PSPDBI. The second model included FSPDBI and PSL account for 56.0% of PSPDBI. In the third model, FSPDBI, PSL, and dependency were included, and account for 58.2 % of PSPDBI (Table 5).

Table 2 Socio-demographics characteristics of the participants (N=93)

Socio-demographics characteristics	**PWHRS** **n (%)**	**Family members** **n (%)**
Gender		
Female	74 (79.6)	73 (78.5)
Male	19 (20.4)	20 (21.5)
Age (year)		
Range	42 – 90	18 – 53
Mean (standard deviation)	72.99 (6.8)	32.8 (9.4)
Underlying disease		0 (0.0)
Hypertension with Hypercholesterolemia	44 (47.3)	–
Hypertension with Diabetes	27 (29.0)	–
Hypertension with Controlled Heart Disease	9 (9.7)	–
Hypertension with Diabetes with Chronic Renal Failure	7 (7.5)	–
Hypertension with Rheumatoid Arthritis	4 (4.3)	–
Hypertension with Migraine	1 (1.1)	–
Hypertension with Chronic Obstructive Pulmonary Disease	1 (1.1)	–
Education level		
Primary school	77 (82.7)	63 (67.7)
Secondary school	12 (12.9)	26 (28.0)
High vocational certificate	2 (2.2)	1 (1.1)
Bachelor degree	2 (2.2)	3 (3.2)
Number of year of formal study		
Range	6 – 16	6 – 16
Mean (standard deviation)	7.18 (2.3)	8.26 (3.3)
Living condition (number of family members, peoples)		
Range	2 – 12	2 – 12
Mean (standard deviation)	4.73 (2.2)	4.73 (2.2)
Family economic status		
Sufficient income and deposit	68 (73.1)	68 (73.1)
Sufficient income	12 (12.9)	12 (12.9)
Insufficient income and owed	9 (9.7)	9 (9.7)
Insufficient income	4 (4.3)	4 (4.3)
# community participation /month	0 – 10	–
Range	1.14 (1.6)	–
Mean (standard deviation)		
# religious ritual /week		
Range	0 – 4	–
Mean (standard deviation)	1.86 (1.2)	–
Relationship		
Daughter / Son	–	45 (48.4)
Daughter in law	–	39 (41.9)
Wife / Husband	–	5 (5.4)
Sibling / Offspring	–	4 (4.3)

= Frequency of

Table 3 Possible score, range, mean, standard deviation, interpretation by mean, and percentage of participants in each interpretation level of study variables

Variables	Possible score	Range	Mean (S.D.)	Interpretation by mean	Percentage of participants in each interpretation level		
					Low (0 -59.9)	Moderate (60 – 79.9)	High (80 -100)
- PSPDBI	18 - 90	18 - 81	44.0 (15.2)	Low	68.8	28.0	3.2
- FSPDBI	18 - 90	38 - 81	59.46 (7.6)	Moderate	14.0	80.6	5.4
- PSL	0 - 66	7 - 52	25.55 (12.2)	Low	82.8	17.2	0.0
- FSL	0 - 66	5 - 48	19.72 (8.3)	Low	96.8	3.2	0.0
- Dependency	1 - 50	14 - 43	31 (5.5)	Moderate	35.5	61.3	3.2
- FR	0 - 40	14 - 28	19.98 (2.8)	Limited	89.2	10.8	0.0

Note. PSPDBI = PWHRS' stroke pre-hospital delay behavior intention,
FSPDBI = Family members' stroke pre-hospital delay behavior intention,
PSL = PWHRS' stroke literacy, FSL = Family members' stroke literacy,
FR= Family relationship,

Table 4 Correlations between predictor variables and SPDBI

Variable	1	2	3	4	5	6	7	8	9	10
Predictor variables										
1. Age	1									
2. Dependency	.09	1								
3. Community participation,	-.04	-.07	1							
4. Living condition	.05	.27**	-.13	1						
5. Education level	-.13	.12	-.02	.09	1					
6. PSL	.13	.02	.12	.02	-.10	1				
7. Religious ritual	-.03	-.19	.35**	-.09	-.07	.15	1			
8. FSL	.08	.11	.13	.03	.08	.94**	.17	1		
9. FSPDBI	.06	-.17	-.03	-.02	.01	-.18	.04	-.22*	1	
10. FR	.14	.02	-.02	.14	-.19	-.01	-.03	-.01	.04	1
PSPDBI	.01	-.32**	.04	-.24*	-.01	-.51**	.06	-.46**	.63**	.04

Note. * $p < .05$, ** $p < .001$,
PSL = PWHRS' stroke literacy, FSL = Family members' stroke literacy,
FSPDBI = Family members' stroke pre-hospital delay behavior intention,
PSPDBI = PWHRS' stroke pre-hospital delay behavior intention,
FR = Family relationship

Table 5 Regression Analysis summary for predicting PSPDBI of PWHRS

Variables	B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	p-value
Model 1					
(Constant)	-30.98	9.83		-3.15	0.002
1. FSPDBI	1.26	0.16	0.63	7.72	<0.001
Model 2					
(Constant)	-9.31	9.30		-1.00	0.320
1. FSPDBI	1.12	0.14	0.56	7.77	<0.001
2. PSL	-0.51	0.90	-0.41	-5.64	<0.001
Model 3					
(Constant)	5.32	11.43		- 466	0.64
1. FSPDBI	1.07	0.14	0.54	7.55	<0.001
2. PSL	- 0.48	0.09	- 0.38	- 5.23	<0.001
3. Dependency	- 0.42	0.20	- 0.15	- 2.12	0.037

Model 1: R= 0.63; R^2 = 0.40; Adjusted R^2 = 0.39; F= 59.55; p<0.001
Model 2: R= 0.75; R^2 = 0.56; Adjusted R^2 = 0.55; F= 55.98; p<0.001
Model 3: R= 0.76; R^2 = 0.58; Adjusted R^2 = 0.57; F= 40.31; p<0.001

Note. FSPDBI = Family members' stroke pre-hospital delay behavior intention,
PSPDBI = PWHRS' stroke pre-hospital delay behavior intention,
PSL = PWHRS' stroke literacy

Discussion

The results revealed that about two-thirds of PWHRS (68.8%) had a low level of PSPDBI score which meant that the PWHRS had a good intention to get into the hospital as soon as any signs/symptoms were observed since some were in a good care of a health system. These communities were in a good hand for stroke prevention and treatment.

However, one-third of PWHRS (31.2%) had a moderate and a high scores of PSPDBI. They would: delay by taking 'wait and see' time before making a decision; take a rest; or take their own medicines if they had any doubt about signs/symptoms of stroke at 53.6%, 51.6%, and 48.4%, respectively. They would go to have a massage or acupuncture if they were sick with any signs or symptoms. Additionally, the mean age of the participants was high (72 years) so that if the participants developed an acute stroke, they might have difficulty to take themselves to a hospital. This might as well reflect in any other ages. With the facing situation of acute stroke, the PWHRS might have less ability to manipulate themselves to get into stroke fast track; therefore the closed helpers were their family members or luckily educated bystanders. Moreover, a recent study in Thailand revealed that care for survivors of stroke is mainly provided by family members.[30]

The first predictor revealed that the FSPDBI was the best predictor of PSPDBI. However, the FSPDBI score was at a moderate level which meant that it might cause a delay to get the PWHRS to a hospital within a golden time period. Family members/bystanders were the most important person and the best predictor to make a proper decision for seeking help or directly transport the PWHRS to a potential hospital in time. Therefore, family members or witnesses to stroke should play important roles in minimizing pre-hospital delay in order to minimize the areas of the brain damages that control both perception and ability to communicate. This was also congruent with previous studies that an appropriate early contact with the EMS system reduced pre-hospital delay.[31-32] Additionally, about a half of the family members (48.8%) were a daughter or son who were the closest helpers for their family stroke acute events. In Thai culture, daughter or son are usually responsible for taking care of their family members' sicknesses. When facing situation of an acute stroke, a daughter or son will contact the system to ask for help in order to reach stroke fast track.

The second predictor was PSL. This study revealed that PSL was at a low level which meant that the PWHRS had poor knowledge and awareness on immediate actions to stroke events for reaching the potential hospital if any signs/symptoms of stroke occurred. The results showed that the FSL is strongly correlated with FSPDBI and both variables are significantly associated with PSPDBI. The SL includes knowledge about stroke, an awareness about stroke warning signs, risk factors and the ability of a patient to gain access to, understand and use stroke information in ways which promote and maintain health. Therefore, it leads a family member to make decisions about going to the hospital in time whenever any warning signs and symptoms of stroke occurred. This study was congruent with several previous studies that many individuals with warning signs of stroke did not realize stroke dangers which could lead to a delay in calling for help.[8,12-14,33]

The last predictor was dependency, which psychologically is reflected in bodily response and internal function[24] such as dependency which makes PWHRS wish to be close to and get help or assistance from others when symptoms of stroke occur. Also, stroke severity and living with others is strongly associated with calling the EMS early, leading to less delay in hospital arrival.[17] Dependency is one of the factors that influences health behaviors that lead to decreasing pre-hospital delay. Fowler and colleagues[35] found dependence showed increased attachment/treatment compliance among women. In this study, most of the participants was female, and 35.5% of the participants prized their personal privacy and felt discomfort or guilt when asking help from family members. The psychological variable (dependency) was correlated with sociocultural variables (number of family members) which means that the normal line of defense (number of family members) and the flexible line of defense (dependency) is a dynamic buffer that mediates the temporary response of the family members in daily life. This interaction has influenced the patient to more likely reach the hospital late. Our findings are supported by the NSM which postulate that all processes of life of the people's internal system influence how the people responses to stressors.

This study revealed that age, community participation, education level, and religious ritual did not correlate with PSPDBI. This study investigated the likelihood of participants' action at stroke onset. Some developmental factors such as age did not correlate with PSPDBI. It is possible that majority of the participants were self-help older persons. Community participation was quite low in this study so it might not have impacted participants' behaviors. Since no other studies were found that explored those relationships, there were no findings for comparison.

Family relationships were limited since most families were nuclear families. However, young people and family members usually take care of sick or older adults in Thai culture.[33] This finding was inconsistent with a previous study[29] that found relationships between family members in the central part of Thailand were moderate level which related to taking care of each other.

Religious ritual was not correlated with PSPDBI. There might be because all the participants were born Buddhists. Level of education did not correlate with

PSPDBI since most of the participants had similar educations, completion of primary school. Thai people face no difficulty with access to health services. This finding was inconsistent with previous studies in the US that found that education level impacted pre-hospital time,[8] but was consistent with an earlier study in Bangkok, Thailand.[12]

Limitation

A limitation of this study is that it used a cross-sectional design, which cannot provide a casual determination between dependent and independent variables. However, the findings are beneficial for situation analysis of our main project that will be further developed as a community care model for any suspected stroke patients. Findings may not be generalizable to those who live in a different context.

Conclusions and Implications for Nursing Practice

Our findings support the notion that processes of life of the people's internal system (psychological and sociocultural environments) influence how people respond to a stressor and to interpersonal stressors (FSPDBI). A family member is a most significant helper to shorten the pre-hospital delay. The PWHRS is also responsible for provoking family member awareness about the occurrence of his/her stroke and prompt decision making. Nurses can develop a intervention to decrease PSPDBI by strengthening caring skill of family for people with acute stroke and prompt seeking help as well as appropriate EMS use. For PWHRS, nurses can develop the intervention to enhances PSL and increase dependency through consulting others concerning and in seeking appropriate assistance to respond to early warning signs and symptoms of acute stroke

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References

1. World Health Organization, The top 10 causes of death [Internet]. 2018 [cited 2018 May 24]. Available from https://www.who.int/news-room/fact-sheets/detail/the-top-10-causes-of-death.
2. Kongbunkiat K, Kasemsap N, Thepsuthammarat K, Tiamkao, S, Sawanyawisuth K. National data on stroke outcomes in Thailand. J Clin Neurosci. 2015; 22: 493-97.
3. Ministry of Public Health. Annual report 2015 [Internet]. 2015 [cited 2016 June 16]. Available from: http://www.thaincd.com/document/file/download/paper-manual/Annual-report-2015.pdf (in Thai).
4. Suwanwela NC. Stroke Epidemiology in Thailand. J Stroke. 2014;16(1):1-7.
5. Nilanont Y, Nidhinandana S, Suwanwela NC, Hanchaiphiboolkul S, Pimpak T, Tatsanavivat P, et al. Quality of acute ischemic stroke care in Thailand: a prospective multicenter countrywide cohort study. J Stroke Cerebrovasc Dis. 2014; 23(2): 213-9.
6. Jauch EC, Saver JL, Adams HP, Jr., Bruno A, Connors JJ, Demaerschalk BM, et al. Guidelines for the early management of patients with acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. Stroke; a journal of cerebral circulation. 2013; 44(3): 870-947.
7. Gurman P, Miranda O, Nathan A, Washington C, Rosen Y, Elman N. Recombinant tissue plasminogen activators (rtPA): A review. Clinical pharmacology & therapeutics. 2015; 97(3): 274-85.
8. Pulvers JN, Watson JDG. If time is brain where is the improvement in pre-hospital time after stroke? Frontiers in Neurology. 2017; 8(617): 1-9.
9. Ashraf VV, Maneesh M, Praveenkumar R, Saifudheen K, Girija AS. Factors delaying hospital arrival of patients with acute stroke. Annals of Indian Academy of Neurology. 2015;18(2): 162-6.
10. Paul CL, Ryan A, Rose S, Attia JR, Kerr E, Koller C, et al. How can we improve stroke thrombolysis rates? A review of health system factors and approaches associated with thrombolysis administration rates in acute stroke care. Implementation Science. 2016; 11(1): 51.

11. Prasat Neurological Institute. Clinical guidelines for ischemic stroke. [Internet]. 2007 [cited 2016 Feb 14]. Available from http://pni.go.th/cpg/ischemic-stroke 2007.pdf
12. Binthaisong T, Panpakdee O, Orathai P, Ratanakorn D. Factors related to one set arrival time in patients with acute stroke. Kuakarun Journal of Nursing. 2013; 20(1): 15-29 (in Thai).
13. Kamsareeruk J, Jitpanya C, Factors related to pre-hospital time in patients with acute ischemic stroke. Journal of the Police Nurse, 2015; 7(2): 107-119 (in Thai).
14. Panyaprachoom P, Harnirattisai T, Muengtaweepongsa S. The factors related to seeking treatment at a hospital using a stroke fast-track referral network system with acute stroke patients. Thammasat Medical Journal. 2017; 17(4): 540-547 (in Thai).
15. Potisopha W. Relationships among response to symptoms and hospital arrival time of acute stroke patients. Journal of Nursing Science and Health. 2015; 38(1): 9-0 (in Thai).
16. Zhao Q, Yang L, Zuo Q, Zhu X, Zhang X, Wu Y, et al. Instrument development and validation of the stroke pre-hospital delay behavior intention scale in a Chinese urban population. Health and Quality of Life Outcomes. 2014; 170(12): 1-9.
17. Faiz KW, Sundseth A, Thommessen B, Ronning OM. Factors related to decision delay in acute stroke. Journal of stroke and cerebrovascular diseases: the official journal of National Stroke Association. 2014; 23(3): 534-9.
18. Mackintosh JE, Murtagh MJ, Rodgers H, Thomson RG, Ford GA, White M. Why people do, or do not, immediately contact emergency medical services following the onset of acute stroke: qualitative interview study. PLoS One. 2012; 7(10):e46124.
19. Yang L, Zhao Q, Zhu X, Shen X, Zhu Y, Yang L, et al. Effect of a comprehensive health education program on pre-hospital delay intentions in high-risk stroke population and caregivers. Quality of Life Research. 2017;26(8): 2153-60.
20. Yanagida T, Fujimoto S, Inoue T, Suzuki S. Causes of pre-hospital delay in stroke patients in an urban aging society. Journal of Clinical Gerontology & Geriatrics. 2014;5(3):77-81.
21. Morren JA, Salgado ED. Stroke literacy, behavior, and proficiency in a South Florida population. J Stroke Cerebrovasc Dis. 2013; 22(7): 962-8.
22. Muengtaweepongsa S, Hunghok W, Harnirattisai T. Poor recognition of prompted treatment seeking even with good knowledge of stroke warning signs contributes to the delayed arrival of acute ischemic stroke patients in Thailand. J Stroke Cerebrovasc Dis. 2014; 23(5): 948-52.
23. Mellon L, Doyle F, Rohde D, Williams D, Hickey A. Stroke warning campaigns: delivering better patient outcomes? A systematic review. Patient-related outcome measures. 2015; 6: 61-73.
24. Neuman, B. Fawcett, J. The Neuman Systems Model. (5th ed) , USA, Upper Saddle River, NJ: Prentice Hall; 2011.
25. Nakhon Pathom Hospital, The stroke fast-track committee report, Nakhon Pathom Province, Thailand. 2015 (in Thai).
26. Faul F, Erdfelder E, Lang A.-G, Buchner A. G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behavior Research Methods. 2007; 39: 175-191.
27. The CV Risk Score Development Group, Thai CKD risk score [Internet]. 2016 [cited 2016 March 20]. Available from https://med.mahidol.ac.th/cvmc/thaicv/
28. Bloom, B, S., Hastings, J, T., Madaus, G, F. Handbook on the formative and summative evaluation of student learning, New York: McGraw-Hill; 1971.
29. Waelveerakup, W. Thumapiroj, T., Suwannasarn, K. Related factors and relationship between students in secondary school and elders in their families. JGG. 2012; 13(3): 11-26 (in Thai).
30. Yaowapanon N, Buddhirakkul P, Srisuphan W, Senaratana W, Potempa K, Chontawan R. Situational Analysis: Community Care for Survivors of Stroke and Suggestions for Improving the Provision of Care. Pacific Rim International Journal of Nursing Research. 2018; 22(4): 372-85.
31. Poaremath, J., Udol, K., Nilamont, Y., Sujirarat, D. Effect of emergency medical services (EMS) utilization on pretreatment time, rate of thrombolytic therapy and 3-month clinical outcomes in acute ischemic stroke patients. GRC 2014 Khon Kaen University Graduate Research Conference, MMP84-1-MMP84-9, 2014 [cited 2015 Jan 12]. Available from http://phep.ph.mahidol.ac.th/Academics.
32. Kim HJ, Ahn JH, Kim SH, Hong ES. Factors associated with pre-hospital delay for acute stroke in Ulsan, Korea. J Emerg Med. 2011; 41(1): 59-63.
33. Chuenjairuang P, Sritanyarat W. Development of primary health care services for stroke prevention in persons with warning signs of stroke. Pacific Rim Int J Nurs Res 2012; 16 (4): 313-25.

34. Pothiban L, Khampolsiri T, Srirat C. Knowledge and awareness of stroke impacts among Northern Thai population. Pacific Rim International Journal of Nursing Research [Internet]. 7 Jun. 2018 [cited 15 Dec.2018]; 22(3):212-2. Available from: https://tci-thaijo.org/index.php/PRIJNR/article/view/79600

35. Fowler JC, Brunnschweiler B, Swales S, Brock J. Assessment of Rorschach dependency measures in female inpatients diagnosed with borderline personality disorder. J Pers Assess. 2005; 85(2): 146-53.

ปัจจัยทำนายพฤติกรรมความตั้งใจในการมาโรงพยาบาลช้าของผู้ที่มีความเสี่ยงสูงต่อโรคหลอดเลือดสมอง

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บทคัดย่อ: ยาละลายลิ่มเลือด (recombinant tissue plasminogen activator) เป็นยาที่แนะนำให้ใช้เพื่อรักษาโรคหลอดเลือดสมองตีบเฉียบพลันและปัจจุบันมีการใช้กันอย่างแพร่หลาย แต่ยานี้มีข้อจำกัดคือระยะเวลาที่การรักษามีประสิทธิภาพจะต้องกระทำอย่างรวดเร็วหลังเกิดอาการ จึงทำให้ผู้ป่วยโรคหลอดเลือดสมองจำนวนมากไม่สามารถเข้าถึงโรงพยาบาลได้ทันเวลาสำหรับช่วงเวลาที่ยาให้ผลการรักษาที่ดี การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อศึกษาปัจจัยที่ทำนายพฤติกรรมความตั้งใจในการมาโรงพยาบาลช้าของผู้ป่วยกลุ่มเสี่ยงสูงต่อโรคหลอดเลือดสมอง การศึกษานี้ใช้รูปแบบการศึกษาแบบภาคตัดขวาง โดยคัดเลือกผู้ป่วยกลุ่มเสี่ยงสูงต่อโรคหลอดเลือดสมองและสมาชิกในครอบครัว จากจังหวัดกึ่งชนบทในเขตภาคกลางของประเทศไทย จำนวน 93 คู่ เก็บรวบรวมข้อมูลโดยใช้แบบสอบถาม ได้แก่ แบบสอบถามข้อมูลเกี่ยวกับคุณลักษณะทางสังคม แบบวัดการพึ่งพา ความรอบรู้เกี่ยวกับโรคหลอดเลือดสมอง สัมพันธภาพในครอบครัว และแบบวัดพฤติกรรมความตั้งใจในการมาโรงพยาบาลช้า วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา สัมประสิทธิ์สหสัมพันธ์เพียร์สัน และสถิติการถดถอยพหุคูณ ผลการวิจัยพบว่า การพึ่งพา จำนวนสมาชิกในครอบครัว ความรอบรู้เกี่ยวกับโรคหลอดเลือดสมองของผู้ที่มีความเสี่ยงสูงต่อโรคหลอดเลือดสมอง และความรอบรู้เกี่ยวกับโรคหลอดเลือดสมองของสมาชิกในครอบครัวมีความสัมพันธ์ในทางกลับกันกับพฤติกรรมความตั้งใจในการมาโรงพยาบาลช้าของผู้ที่มีความเสี่ยงสูงต่อโรคหลอดเลือดสมอง แต่ของสมาชิกในครอบครัวมีความสัมพันธ์ทางเดียวกันกับพฤติกรรมความตั้งใจในการมาโรงพยาบาลช้าของผู้ที่มีความเสี่ยงสูงต่อโรคหลอดเลือดสมอง จากการวิเคราะห์การถดถอยพหุคูณ พบว่า พฤติกรรมความตั้งใจในการมาโรงพยาบาลช้าของสมาชิกในครอบครัว ความรอบรู้เกี่ยวกับโรคหลอดเลือดสมอง และการพึ่งพาของผู้ที่มีความเสี่ยงสูงต่อโรคหลอดเลือดสมอง สามารถร่วมกันทำนายความความแปรปรวนของพฤติกรรมความตั้งใจในการมาโรงพยาบาลช้าได้ ร้อยละ 58.2 ผลการวิจัยครั้งนี้ชี้แนะให้พยาบาลพัฒนารูปแบบการดูแลผู้ป่วยก่อนส่งถึงโรงพยาบาล โดยพัฒนาการปฏิบัติการที่สามารถลดพฤติกรรมความตั้งใจในการมาโรงพยาบาลช้าของสมาชิกในครอบครัว เพิ่มความรอบรู้เกี่ยวกับโรคหลอดเลือดของผู้ที่มีความเสี่ยงสูงต่อโรคหลอดเลือดสมอง และสมาชิกในครอบครัว และเพิ่มการขอความช่วยเหลืออย่างเหมาะสม (การพึ่งพา) ซึ่งจะช่วยให้ผู้ป่วยโรคหลอดเลือดสมองเฉียบพลันเข้าถึงการรักษาด้วยยาละลายลิ่มเลือดได้รวดเร็วทันเวลา

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คำสำคัญ: พฤติกรรมความตั้งใจ การพึ่งพา ครอบครัว ความเสี่ยงต่อโรคหลอดเลือดสมอง โรคหลอดเลือดสมอง ความรอบรู้เกี่ยวกับโรคหลอดเลือดสมอง

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Health–Related Quality of Life among People Receiving Smoking Cessation Services

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Abstract: Few studies have addressed health-related quality of life and smoking cessation although known improvements can encourage smokers to quit. This cross-sectional study examined smoking quit rates and health-related quality of life among smokers receiving cessation services in ten Quit Clinic Hospitals throughout Thailand. A random sample of 715 smokers participated in the study. Data were collected from medical records and via telephone interviews from March to July 2015. Research instruments included demographic questions, a smoking screening form, the Quit Smoking Questionnaire; and the EuroQol-5 Dimensions 5 Levels Questionnaire (Thai version). Data were analyzed using descriptive statistics, Chi-square, and independent sample t-test.

Most participants (97.1%) were male and between 25 and 64 years of age. Most had heaviness of smoking index scores less than four, indicating low nicotine dependence. The self-reported continuous abstinence rate at 6-months was 40.5%. The participants who stopped smoking by 6 months had higher average scores on the health-related quality of life than those who continued to smoke. As nurses are recognized as influential persons in the health care team, they can implement tobacco cessation interventions through a variety of strategies, such as providing brief advice, and referring for advanced treatment. Likewise, nurses need to consider assessing health-related quality of life of smokers and use such information to advocate smokers to quit.

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Introduction

Non-communicable diseases (NCDs) such as cancer, cardiovascular disease and diabetes are global health threats to sustainable development. Many international health organizations have realized this and worked collaboratively to address these health concerns. To date, a number of strategies and action plans to prevent and control NCDs have been established[1], for instance, the Global Action Plan for the Prevention and Control of NCDs 2013 – 2020, WHO 'Best Buys' for NCDs. These actions focus mainly on four behavioral risk factors: tobacco use, harmful use of alcohol, unhealthy diet, and physical inactivity. Tobacco use still remains a significant health issue in Thailand due to smoking-related morbidity and mortality and a slow decline in smoking prevalence.[2] Although the number of smokers in Thailand has been decreasing, there still are 10.7 million smokers as reported by the Thai National Statistical Office in 2017[3] which surveyed the smoking and alcohol consumption of Thai people aged 15 years and older. This number is still high since the target is to reduce smoking by 30%[4] or to reach a prevalence of 15.75% or lower. This goal is what Thailand has agreed to achieve in the WHO Global Action Plan for the Prevention and Control of NCDs 2013 – 2020 and the 5-Year National NCD Prevention and Control Strategic and Action Plan (2017 – 2021).[5] In addition, the economic burden of smoking-related causes has been estimated at 74.88 billion THB (US$2.18, 95% CI US$2.17 to US$2.19 billion), approximately 0.78% of GDP, while the tobacco industry only generated an estimated 0.50% of GDP.[6]

The World Health Organization (WHO) has recommended all member countries implement effective measures to curb tobacco use. For instance, Article 14 of the WHO Framework Convention on Tobacco Control (FCTC) recognizes tobacco dependence treatment and cessation as one of the key demand-reduction measures. The WHO FCTC Article 14 guidelines also recognize the important roles that health professionals, including nurses, play in the delivery of tobacco cessation interventions.[7] While there is strong evidence to suggest the effectiveness and affordability of smoking cessation interventions[8], the WHO recommended three types of clinical interventions: cessation advice in primary health care system, quit lines, and pharmacological therapy.[9] Systematic reviews have shown that the provision of tobacco cessation interventions by nurses, e.g. brief advice, counseling, and/or strategies to help people quit smoking, significantly increased the likelihood of quitting.[10, 11] The International Council of Nurses also encourages nurses to "...integrate tobacco use prevention and cessation ... as part of their regular nursing practice."[12]

In an effort to comply with Article 14, Thailand, as a state party of the WHO FCTC, has included the promotion of cessation and reduction of tobacco use in the last two National Strategic Plans for Tobacco Control, 2012-2014 and 2016 – 2019. Over the past decade, there has been more attention given to the provision of tobacco dependence treatment in Thailand. For instance, capacity building efforts in smoking cessation counseling have been arranged for health professionals, including nurses, to increase the delivery of tobacco dependence treatment in clinical practice.[13] Since 2013, Thailand has been recognized as an upper-middle-income country of 65 million people that provides access to free services for smoking cessation, including a toll-free national quit line.[9] In addition, the "Fa-sai Clinic" or the Smart Quit Clinics Network, initiated by the Thai Physicians Alliance against Tobacco, was launched in 2011 to provide smoking cessation treatment in community and general hospitals. Currently, over 500 hospitals nationwide have become network members. However, no evidence existed to support the effectiveness of the SMART Quit Clinic Network. Such information is vital for policy makers' decision making in funding smoking cessation services. Likewise, despite numerous research studies reporting economic and health benefits of smoking cessation, only a few studies have addressed health-related quality of life (HRQL) and smoking cessation.[14-16] Evidence of the influence of smoking cessation on quality of life can be useful in encouraging smokers to quit. However, in Thailand, HRQL among people by smoking status after receiving cessation advice is limited.

Review of literature

The SMART Quit Clinics Network:

The Smart Quit Clinic Network, as known as the Fah-sai Clinic, sponsored by the Thai Health

Promotion Foundation, provides comprehensive smoking cessation services in hospitals. At the beginning, only five clinics in Bangkok metropolitan area joined the program. Currently, 552 hospitals have joined the Network covering 77 provinces across Thailand. The network program offers free-of-charge training, a breath carbon monoxide (CO) monitor, a smoked lung model, and medications for smoking cessation, such as nicotine gum, bupropion to each hospital network member. The Fah-sai Clinic is mainly operated by trained nurses with physician consultation if needed. The treatment protocol for Fah-sai Clinic includes assessment of smoking status and nicotine dependence, provision of smoking cessation brief advice or intensive counseling, or provision of smoking cessation medication with indications. During the first five year of operation, it was reported that six-month continuous abstinence rate ranged from 6.5% to 34.5%.[17]

Smoking cessation and Health Related Quality of Life:

Health-related quality of life (HRQL) reflects a person's evaluation of his/her physical, psychological and social functioning in relation to health.[18] HRQL data can be used as an interventional tool to encourage smoking cessation, tailor cessation plan, and improve smoking quit rates.[19] Previous studies reported HRQL and smoking cessation using different measures of HRQL. In the two Nurses' Health Study (NHS) cohorts, Sarna et al.[14] reported lower HRQL in both physical and mental components among continuing smokers as compared to former and those who had never smoked (termed never smokers). Likewise, among smokers calling the Thailand National Quitline, using the Short Form-12 Health Survey (Version 2), the average score of HRQL physical component was 50.62 (SD=8.96), while the mental component was 54.91 (SD= 9.27). The participants who stopped smoking over 3 and 6 months had higher average score of HRQL in both physical and mental components than those who continued to smoke.[20, 21]

A prospective cohort study, using the disease-specific questionnaire, the St. George's Respiratory Questionnaire found improvement in HRQL after only a 3-month smoking cessation program, regardless of quit status.[18] Nevertheless, no significant difference in HRQL between quitters and continuous smokers were detected.[18] In west Iran a cross-sectional study involving 1,543 participants assessed HRQL using the EuroQol 5 Dimensions 3 Level (EQ-5D-3L) Questionnaire. The results showed that current smokers had significantly lower HRQL compared to the past and never smokers.[15] Likewise, a longitudinal study in Taiwan by Chen et al[22] assessed HRQL, using the EQ-5D, in smokers one year after participation in a smoking cessation program. This study indicated that the participants who quit for 1 year or for 6 months experienced less anxiety and depression than did continuing smokers. Levy et al.[16] examined HRQL among hospitalized smokers, using the 5-level EQ-5D version. They reported a strong association between smoking abstinence and improvements in HRQL, at 6 months post-discharge.

Study aim

To examine smoking quit rates among smokers receiving services from quit-clinic hospitals in Thailand and to compare the HRQL between the participants who could quit smoking by six months and those who continued to smoke.

Methods

Design: A cross-sectional descriptive study

Sample and Setting: The population consisted of smokers who received smoking cessation services from the ten hospitals in the Smart Quit Clinic Network. A random sample of 1,000 clients from ten selected hospitals who met inclusion criteria were invited to take part. The hospitals were purposively chosen based on adequacy of reports and the number of clients (more than 300 clients per year). Client eligibility included those who first visited the cessation clinic from January to June 2014 (at least 6 months before data collection period), received a 20- to 40-minute counseling session and at least one follow-up contact, and gave verbal consent for follow-up contact and telephone interview. Seven hundred and fifteen smokers participated in this study and the response rate was 71.5%

Ethical Considerations: Approval to conduct the study was obtained from the Ethics Review Committee for Research Involving Human Research Subjects, Health Sciences Group, Chulalongkorn University (COA no 200.1/57). Verbal consent was obtained from each potential participant prior to data collection. Each participant was informed about the purpose of the study, and their rights to confidentiality and anonymity, as well as being able to terminate their study participation at any time with no effect on their hospital services.

Instruments: The instruments for data collection included a demographic data form, a quit smoking questionnaire, and the Thai version of the EuroQol-5D-5L (EQ-5D-5L) questionnaire.

A demographic data form was developed based on a literature review. This form consisted of questions regarding personal data and smoking-related characteristics, including the number of cigarettes smoked daily, time of first cigarette after waking, motivation to quit smoking, the type of tobacco products used, and self-confidence to quit smoking. This information was obtained from participants' medical records before the interview.

The Quit Smoking Questionnaire was self-reported and assessed participant's smoking status. This questionnaire was modified from the version in previous studies.[20, 21] The participants were asked the opening question: "Currently, do you smoke cigarettes?". If the answer to this was "No", they were asked: "During the past seven days, did you continuously abstain from smoking?", and "Have you continuously abstained from smoking for 3 months, and 6 months." If the answer to the first question was "Yes", participants were asked whether they had made any quit attempt (24-hour abstinence) after receiving cessation counseling, and the longest duration of the previous quit attempt.

The Thai version of the EuroQol 5-dimensions 5-level (EQ-5D-5L) was used to measure HRQL with permission from the EuroQol Research Foundation. This instrument is a standardized tool for the measurement of generic HRQL and has been widely used worldwide in a variety of research fields due to its practical, reliable, and valid.[23-25] It has two parts: a descriptive profile and a visual analog scale (EQ-VAS). The first part includes five dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Each dimension has five levels of response, covering no problem (level 1), slight problems (level 2), moderate problems (level 3), severe problems (level 4), and extreme problems (level 5). A total of 3,125 possible health states can be identified by combining one level from each dimension, ranging from (full health) to 55555 (worst health).[23-25] After a participant answers the questionnaire, their health state can be identified using a five-digit number. For instance, a health state in which a person has moderate problem in mobility, slight problems in self-care, slight problems in usual activities, no problems in pain/discomfort, and no problems in anxiety/depression can be coded as 32211. Then, each health state can be converted to the EQ-5D-5L index score based on the Thai value set of EQ-5D-5L[26] that can be downloaded from the Health Intervention and Technology Assessment Program (HiTAP) website.[27] The Thai EQ-5D-5L index scores range from -0.283 to 1.00, where 1.00 and 0 represent perfect health and death, respectively, with negative values indicating states worse than death.[24, 26] The second part is a visual analogue scale (EQ-VAS) which assesses health status, ranging from 0 to 100, where 0 describes the worst and 100 the best possible condition. Previous studies showed good psychometric properties of EQ-5D-5L, Thai version.[24, 26, 28] In this study, the Cronbach's alpha value of the first part of the EQ-5D-5L was 0.83.

Data collection

Data were collected by a research assistant (RA) from each hospital site. Ten RAs, registered nurses working in the Fa-sai clinic and having experiences in smoking cessation counseling, were trained for data collection. With permission from the director of each site, the list of potential participants was given to the principal investigator (PI) who randomly selected them. RAs performed a medical record review on each identified participant to collect personal data and smoking characteristics. Then, the RAs approached the participants by telephone, invited them to join the study, and interviewed them after verbal consent was given. The telephone interview was used to collect information related to smoking status and HRQL throughout March and July 2015, but 285 out of 1,000 identified participants were not able to be contacted after three phone attempts were made.

Data analysis

Data analyses were performed using SPSS 22.0 statistical software (IBM SPSS Corp, Armonk, NY, USA). Descriptive statistics were performed for sample characteristics and the study variables. Participants who reported achieving six-month continuous abstinence were considered quitters, while the others were considered non-quitters. Comparison of the demographic characteristics between the quitter group and the non-quitter group were analyzed using the independent sample t-test for continuous variables or the chi-square test for categorical variables. Univariate covariance analyses (ANCOVA) were carried out to compare the HRQL (the EQ-VAS) between the quitters and non-quitters, while heaviness smoking index and age were included in the analysis as a covariate due to their being potential confounders.

Results

Baseline characteristics

A total of 715 clients who received services from the selected SMART quit clinics agreed to participate in this study and their demographic and smoking characteristics are shown in Table 1. The majority (97.1%) were males, and the mean age of participants was 47.1 years (SD = 14.5 years). Equally 40% of participants were between 25-44 years and between 45-64 years. No significant differences in age or having diseases were noted between the smokers and former smokers. About half of participants reported using manufactured cigarettes (54.8%). Data on number of cigarettes smoked daily and time of first cigarette upon waking were used to calculate the heaviness of smoking index (HSI) score. HSI is used extensively as a behavioral measure of nicotine dependence in previous studies.[29, 30] The cutoff point for high nicotine dependence is a score of ≥4.[29] In this study, the majority of participants had baseline HSI index scores <4, indicating a low nicotine dependence before receiving cessation service. The participants indicated their motivation factors for quitting smoking, which included health concerns (53.0%), family request (58.9%), and advice from health professionals (25.9%). In addition, less than 25% of participants reported having self-confidence to quit smoking (**Table 1**).

Smoking abstinence rate

The outcome measure for smoking cessation in this study was the self-reported continuous abstinence rate at six months follow-up. Of the 715 participants, 40.6% achieved 6 months of continuous abstinence. There was no significant difference in 6-month abstinence rates among age groups. However, significant differences in occupation and time to first cigarette in the morning (at baseline) were observed between quitters and non-quitters (**Table 1**).

Health-related quality of life

Descriptive statistics of the EuroQol 5-dimensions-5-level (EQ-5D-5L), EQ-5D-5L index, and a visual analog scale (EQ-VAS) are reported in **Table 2**. The majority of participants had no problem with self-care (91.0 %), mobility (81.1 %), usual activities (79.6%), and anxiety or depression (71.2%). About 56.7% reported no problems from pain or discomfort. Unexpectedly, the proportion of those who reported ‘slight’ to ‘severe’ problems across the five dimensions was somewhat higher for the participants who were quitters than for those who continued to smoke. However, when performing chi-square tests, no significant differences were observed.

Table 1. Number and percentage of the participants by demographic and smoking characteristics

	Total		Quitters		Non-quitters		p-value
	n	%	n	%	n	%	
Gender							
Male	694	97.1	278	95.9	416	97.9	.116[a]
Female	21	2.9	12	4.1	9	2.1	
Age (years)							
16 - 24	48	6.7	13	4.5	35	8.2	.137[b]
25 - 44	284	39.8	115	39.8	169	39.8	
45 - 64	291	40.8	115	39.8	176	41.4	
> 64	91	12.7	46	15.9	45	10.6	
mean±SD	47.1±14.5		48.1±14.4		46.5±14.6		
Occupation							
Agriculturist	114	16.4	45	15.9	69	16.8	.034[a]
Currently employed	433	62.4	176	62.2	257	62.5	
Unemployed	119	17.2	57	20.1	62	15.1	
Others (students, monks, etc.)	28	4.0	5	1.8	23	5.6	
Having health conditions	391	54.7	162	55.9	229	53.9	.602[a]
Number of cigarettes smoked per day (baseline)							
1 - 10	335	46.9	140	48.3	195	45.9	.655[a]
11 - 20	297	41.5	119	41.0	178	41.9	
21 - 30	64	9.0	22	7.6	42	9.9	
> 30	19	2.7	9	3.1	10	2.4	
Time to first cigarette in the morning (baseline)							
Within 5 minutes	185	26.0	56	19.4	129	30.5	.003[a*]
6 - 30 minutes	206	28.9	89	30.8	117	27.7	
31 - 60 minutes	175	24.6	86	29.8	89	21.0	
> 60 minutes	146	20.5	58	20.1	88	20.8	
Heaviness of smoking index							
mean±SD	2.28±1.47		2.15±1.44		2.36±1.48		.06[b]
Type of tobacco products							
Manufactured cigarettes	387	54.8	148	51.9	239	56.8	.060[a]
Roll-your-own cigarette	139	19.7	51	17.9	88	20.9	
Both manufactured cigarette and Roll-your-own cigarette	180	25.5	86	30.2	94	22.3	
Motivation to quit smoking[c]							
Having health conditions	374	53.0	177	61.9	197	47.0	
Family request	421	58.9	167	57.6	254	59.8	
Advice from health professionals	185	25.9	66	22.8	119	28.0	
Smoking is wasteful	139	19.4	69	23.8	70	16.5	
Smoking is not good for health	99	13.8	43	14.8	56	13.2	
Having high self-confidence in quitting (baseline)	167	23.4	77	26.6	90	21.2	.090[a]

Note: a tested via chi-Square test, b tested via t-test, c – more than one

In addition, the overall HRQL as measured by the mean EQ-5D-5L index value was 0.93±0.12 while mean EQ-VAS score was 81.5± SD 13.0. The mean EQ-5D-5L index scores for the non-quitters and the quitters were 0.94 ± SD 0.09 and 0.91 ± SD 0.13, respectively (**Table 2**). This was an unexpected result. However, the participants who stopped smoking at six months (the quitters) had higher average scores on EQ-VAS than those who continued to smoke (p-value < .05). In addition, the results of ANCOVA showed a significant difference between the quitters and those continuing to smoke in the mean score of EQ-VAS after controlling for age and heaviness smoking index ($F = 9.44$, $p < 0.05$). (**Table 3**).

Table 2. Comparison of the HRQL between quitter and non-quitter groups

EQ-5D Dimensions	Total		Quitters		Non-quitters	
	n	%	n	%	n	%
Mobility						
No problem	581	81.1	225	77.6	356	83.6
Slight problems	93	13.0	42	14.5	51	12.0
Moderate problems	28	3.9	15	5.2	13	3.1
Severe problems	11	1.5	6	2.1	5	1.2
Unable to walk	3	0.4	2	0.7	1	0.2
Self-care						
No problem	652	91.0	256	88.3	396	93.0
Slight problems	47	6.6	24	8.3	23	5.4
Moderate problems	13	1.8	7	2.4	6	1.4
Severe problems	4	0.6	3	1.0	1	0.2
Usual activities						
No problem	570	79.6	216	74.5	354	83.1
Slight problems	112	15.6	55	19.0	57	13.4
Moderate problems	22	3.1	10	3.4	12	2.8
Severe problems	12	1.7	9	3.1	3	0.7
Pain/Discomfort						
No problem	406	56.7	153	52.8	253	59.4
Slight problems	259	36.2	107	36.9	152	35.7
Moderate problems	47	6.6	27	9.3	20	4.7
Severe problems	4	0.6	3	1.0	1	0.2
Anxiety/Depression						
No problem	510	71.2	190	65.5	320	75.1
Slight problems	173	24.2	80	27.6	93	21.8
Moderate problems	27	3.8	18	6.2	9	2.1
Severe problems	6	0.8	2	0.7	4	0.9
	Mean	**SEM**	**mean**	**SEM**	**Mean**	**SEM**
EQ-5D-5L Index	.9333	.00440	.9162	.00816	.9449	.00481
EQ VAS	81.50	0.486	82.80	0.741	80.61	0.640

Table 3 Comparison of HRQL between quitter and non-quitter groups by adjusting age and heaviness of smoking index (n =715)

	HRQLHealth				
	Observed Mean	Adjusted Mean		SD	n
Quitter group	80.61	80.61		13.23	425
Non-quitter group	82.80	82.80		12.62	290
Source	SS	df	MS	MS	F
Age	13161.75	3	4387.25	4387.25	31.53
Heaviness of smoking index	769.22	2	384.61	384.61	2.76
Continuous abstinence for six months	1312.84	1	1312.84	1312.84	9.44* (p=.002)
Error	97820.11	703	139.15	139.15	

Note. R^2= .191, Adj. R^2= .179, *p<.05

DISCUSSION

In this study, the six-month continuous abstinence rate (CAR) in smokers receiving services from the SMART quit clinics was 40.60% with the 71.5% of responder rate (RR) and 29.03% as an Intention-To-Treat (ITT) approach where all non-respondents are considered to be smoking.

This abstinence rate is higher than that achieved by the Thai National Quitline in 2015[31] (which was 33.1%). However, a cross-sectional study in 2016 indicated that the six-month CAR in smokers calling the Thai National Quitline was 51.5%[20, 21] which could be explained by the influence of numbers of follow-up. It should be noted that these results should not be compared to some previous studies because of differences in study population and self-report measures of cessation. The study also showed that the participants did not report high self-confidence to quit smoking, a significant predictor in smoking abstinence in previous research.[21, 32] Also, first three reasons motivating them to quit smoking included health concerns, family request, and advice from health professionals. This suggests that nurses may have an important 'window of opportunity' to design appropriate tobacco cessation intervention that promote smokers' confidence to abstain from smoking.

As to HRQL, the participants in this study had an average EQ-5D-5L index of 0.93, higher than Thai patients with chronic diseases (0.86± 0.14).[24] A possible explanation could be that more than half of the participants were young adults and middle-aged adults and less than half did not have health conditions. The results showed that the mean EQ-5D-5L index of the quitters was less than that of the non-quitters and this is not consistent with A previous study. A cross-sectional study by Rezaei et al.[15] found a mean EQ-5D index score of the former smokers (0.70 ± 0.22) was higher than those of the current smokers (0.69±0.17). However, our findings demonstrated that the quitters reported slightly more problems in the EQ-5D dimensions. This might be due to differences in the background characteristics of participants, such as age and nicotine dependence. Additionally, our participants who could quit smoking were older than those who could not, and the proportion of the first group reporting an illness was higher than the second group. We did not collect data of EQ-5D-5L before quitting; thus, we could not assess changes in HRQL. Levy et al. reported a significant improvement in *all* EQ-5D *dimensions* among smokers who remained abstinent at 6 months after hospitalization.[16]

In this study, the mean EQ-VAS score of all participants (81.50± 13.01) was slightly lower than the Thai national average.[26] The mean EQ-VAS score of the quitters who remained abstinent at 6 months was significantly higher than that of the non-quitters after controlling for age and heaviness smoking index. These findings are similar to those in previous studies using the same instrument and different health-related quality of life (HRQL) instruments, such as the SF-36. For instance, a study in Taiwan by Chen et al.[22] found that the mean VAS of long-term quitters (abstained from cigarettes ≥6 months) was 79.20% and long-time former smokers, quitting for a short or long time showed higher EQ-VAS scores than continuing smokers. Similarly, other studies found that continuing smokers reported lower HRQL, as assessed by the SF-36, than former and never smokers.[14, 20, 21]

This study has some limitations. First, since it is a cross-sectional study, no conclusions on causality can be drawn. In addition, recall bias may have occurred in this study as we had no information on the health status of the participants before they quit smoking. Moreover, smoking cessation was evaluated using self-report only and was not biochemically confirmed.

Conclusion and Implication for Nursing Practice

This is the first study to provide substantial data on health-related quality of life in Thai smokers receiving treatment from hospital-based cessation clinics. The current findings suggest that the SMART Quit clinics can help smokers quit and can benefit health-related quality of life. Nurses have a significant role in assisting persons to quit smoking and are key persons who run a smoking cessation service. The International Council of Nurses promotes integrating tobacco cessation interventions into regular practice,[12] so nurses need to implement interventions through a variety of strategies, starting with implement record keeping about patients' tobacco use in all nursing notes and regarding the provision of brief advice, extended counseling follow-up, or referral for further treatment, such as giving patients the quitline toll-free number or medication. The health conditions of people could be used as motivating factors to quit smoking. In addition, nurses could consider HRQL assessment, using the EQ-5D-5L questionnaire due to it being both a practical and reliable instrument, and use HRQL information to advocate smokers to quit. The findings of the study can also serve as baseline for nurses or researchers in Thailand, as well as inform researchers elsewhere. Studies with prospective designs are needed to further determine the long-term effects of smoking cessation on HRQL.

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References

1. Riley L, Guthold R, Cowan M, Savin S, Bhatti L, Armstrong T, Bonita R. The World Health Organization STEPwise approach to noncommunicable disease risk-factor surveillance: Methods, challenges, and opportunities. Am J Public Health. 2016;106(1):74-8. doi.org/10.2105/AJPH.2015.302962
2. Pitayarangsarit S, Chotibenjamaporn P, Pankrajang P. (Eds). A situation of tobacco control in Thailand 2016. Bangkok: Charoendee Munkong Publishing; 2016. (in Thai).
3. Pitayarangsarit S, Pankrajang P. (Eds). A report on tobacco consumption in Thailand 2018. Bangkok: Charoendee Munkong Publishing; 2018. (in Thai).
4. Karnjanapiboonwong A. NCDs situation: Kick off to the goals. Nonthaburi: International Health Policy Program; 2016. (in Thai).
5. Pitayarangsarit S, Garg R, Khunsri S, Thepsit S, Apiya T. Situation on NCDs prevention and control in Thailand. Nonthaburi: Department of Disease Control, Ministry of Public Health; 2018. [cited 2018 Nov 4]. Available from: http://www.thaincd.com/document/file/download/paper-manual/NCDUNIATF61.pdf

6. Bundhamcharoen K, Aungkulanon S, Makka N, Shibuya K. Economic burden from smoking-related diseases in Thailand. Tob Control. 2016; 25(5): 532-7. doi.org/10.1136/tobaccocontrol-2015-052319
7. World Health Organization. WHO Framework convention on tobacco control: Guidelines for implementation Article 5.3; Article 8; Article 9 and 10; Article 11; Article 12; Article 13; Article 14 – 2013 edition. Switzerland: World Health Organization; 2013.
8. West R, Raw M, McNeill A, Stead L, Aveyard, P, Bitton J, et al. Health-care interventions to promote and assist tobacco cessation: a review of efficacy, effectiveness and affordability for use in national guideline development. Addiction. 2015; 110: 1388–1403. http://doi.org/10.1111/add.12998
9. World Health Organization. WHO report on the global tobacco epidemic, 2013: enforcing bans on tobacco advertising, promotion and sponsorship. Luxembourg: WHO Press, World Health Organization; 2013.
10. Kazemzadeh Z, Manzari Z, & Pouresmail Z. Nursing interventions for smoking cessation in hospitalized patients: a systematic review. Int Nurs Rev. 2017; 64(2): 263-75. doi: 10.1111/inr.12320.
11. Rice VH, Heath L, Livingstone-Banks J, Hartmann-Boyce JL. Nursing interventions for smoking cessation. Cochrane Database Syst Rev. 2017 Dec 15;12:CD001188. doi: 10.1002/14651858.CD001188.pub5.
12. International Council of Nurses. Tobacco use and health: ICN Position Statement. [cited 2019 Mar 19]. Available from: https://www.icn.ch/nursing-policy/position-statements
13. Preechawong S, Vateesatokit K, & Suwanratsamee S. Effects of tobacco cessation counseling training on Thai professional nurses' self-efficacy and cessation counseling practices. Pacific Rim Int J Nurs Res. 2011; 15 (1): 3 – 12.
14. Sarna L, Bialous SA, Cooley ME, Jun HJ, Feskanich D. Impact of smoking and smoking cessation on health-related quality of life in women in the Nurses' Health Study. Qual Life Res. 2008; 17(10): 1217–27. doi.org/10.1007/s11136-008-9404-8
15. Rezaei S, Matin BK, Karyani AK, Woldemichael A, Khosravi F, Khosravipour M, et al. Impact of smoking on health-related quality of life: A general population survey in west Iran. Asian Pac J Cancer Prev. 2017; 18(11): 3179-85. doi.org/10.22034/APJCP.2017.18.11.3179
16. Levy DE, Chang Y, Regan S, Tindle HA, Singer DE, Rigotti NA. Improvements in health-related quality of life among smokers who quit after hospitalization. Prev Med. 2018; 110: 38-46. doi: 10.1016/j.ypmed.2018.02.006
17. Session 3. APSR6-0842: Setting up a successful smoking cessation program. Respirology. 2016; 21: 7-9. doi: 10.1111/resp.12939_4
18. Tomioka H, Sekiya R, Nishio C, Ishimoto G. Impact of smoking cessation therapy on health-related quality of life. BMJ Open Respir Res. 2014; 1(1): e000047. doi:10.1136/bmjresp-2014-000047
19. Goldenberg M, Danovitch I, IsHak WW. Quality of life and smoking. Am J Addict. 2014; 23 (6): 540-562. doi:10.1111/j.1521-0391.2014.12148.x
20. Yunibhand J, Preechawong S, Rojnawee S, Khongtor O, Wongsaita N, Khamrath J. Effects of follow-up support calls on quality of life and quit rate among smokers calling Thailand National Quitline. Research report. Chulalongkorn University. Bangkok; 2015.
21. Rojnawee S, Khongtor O, Preechawong S, Yunibhand J, Wongsaita N, Khamrath J. Predicting factors of smoking cessation among smokers calling Thailand National Quitline. Journal of Nurs Science & Health. 2016; 339(1): 37-47. (in Thai).
22. Chen PC, Kuo RN, Lai CK, Tsai ST, Lee YC. The relationship between smoking status and health-related quality of life among smokers who participated in a 1-year smoking cessation programme in Taiwan: a cohort study using the EQ-5D. BMJ Open. 2015; 5(5), e007249. doi.org/10.1136/bmjopen-2014-007249
23. Herdman M, Gudex C, Lloyd A, Janssen M, Kind P, Parkin D, et al. Development and preliminary testing of the new five-level version of EQ-5D (EQ-5D-5L). Qual Life Res. 2011; 20(10):1727-36. http://doi.org/10.1007/s11136-011-9903-x
24. Sakthong P, Sonsa-Ardjit N, Sukarnjanaset P, Munpan W. Psychometric properties of the EQ-5D-5L in Thai patients with chronic diseases. Qual Life Res. 2015; 24(12): 3015-22. doi.org/10.1007/s11136-015-1038-z
25. EQ-5D-5L User Guide. Basic information on how to use the EQ-5D-5L instrument. [cited 2019 Mar 6]. Available from: https://euroqol.org/wp-content/uploads/2016/09/EQ-5D-5L_UserGuide_2015.pdf

26. Pattanaphesaj J. Health related quality of life measure (EQ-5D-5L): Measurement property testing and its preference-based score in Thai population. [Dissertation]. [Bangkok]: Mahidol University; 2014.
27. The Health Intervention and Technology Assessment Program (HITAP). Calculating the utility score. [cited 2019 March 17]. Available from http://www.hitap.net/documents/89762
28. Pattanaphesaj J, Thavorncharoensap M. Measurement properties of the EQ-5D-5L compared to EQ-5D-3L in the Thai diabetes patients. Health Qual Life Outcomes. 2015;13:14. doi: 10.1186/s12955-014-0203-3
29. Lim KH, Idzwan MF, Sumarni MG, Kee CC, Amal NM, Lim KK, Gurpreet K. Heaviness of smoking index, number of cigarettes smoked and the Fagerstrom test for nicotine dependence among adult male Malaysians. Asian Pac J Cancer Prev. 2012;13(1):343-6.
30. Zawertailo L, Voci S, Selby P. The Cigarette Dependence Scale and Heaviness of Smoking Index as predictors of smoking cessation after 10weeks of nicotine replacement therapy and at 6-month follow-up. Addict Behav. 2018; 78:223-227. doi: 10.1016/j.addbeh.2017.11.036.
31. Meeyai A, Yunibhand J, Punkrajang P, Pitayarangsarit S. An evaluation of usage patterns, effectiveness and cost of the national smoking cessation quitline in Thailand. Tob Control. 2015 Sep;24(5):481-8.
32. Jampaklay A, Borland R, Yong HH, Sirirassamee B, Fotuhi O, Fong GT. Predictors of Successful Quitting among Thai Adult Smokers: Evidence from ITC-SEA (Thailand) Survey. Int J Environ Res Public Health. 2015;12(10): 12095-109. doi:10.3390/ijerph121012095

คุณภาพชีวิตด้านสุขภาพในประชาชนผู้รับบริการเลิกบุหรี่

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บทคัดย่อ: แม้จะทราบกันดีว่าคุณภาพชีวิตด้านสุขภาพสามารถจูงใจให้ผู้สูบบุหรี่เลิกสูบได้ แต่การศึกษาเรื่องนี้ยังมีไม่มากนัก การศึกษาภาคตัดขวางนี้ศึกษาอัตราการเลิกบุหรี่และคุณภาพชีวิตด้านสุขภาพของผู้สูบบุหรี่จำนวน 715 คน สุ่มจากผู้มารับบริการจากคลินิกเลิกบุหรี่ในโครงการเครือข่ายคลินิกฟ้าใส เก็บรวบรวมข้อมูลโดยใช้แบบบันทึกข้อมูลส่วนบุคคลจากจากเวชระเบียนและสัมภาษณ์ทางโทรศัพท์ระหว่างมีนาคม ถึง กรกฎาคม 2558 เครื่องมือที่ใช้เก็บรวบรวมข้อมูลประกอบด้วยแบบบันทึกข้อมูลส่วนบุคคลและข้อมูลเกี่ยวกับการสูบบุหรี่ แบบสัมภาษณ์การเลิกบุหรี่ และแบบสอบถามคุณภาพชีวิตด้านสุขภาพซึ่งพัฒนาโดยกลุ่มนักวิจัย EuroQol ฉบับภาษาไทย วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา ไคว์สแควร์ และการทดสอบที ผลการวิจัยพบว่า กลุ่มตัวอย่างส่วนใหญ่เป็นเพศชาย อายุระหว่าง 25-64 ปี ส่วนใหญ่ติดนิโคตินในระดับต่ำ อัตราการเลิกบุหรี่แบบต่อเนื่องที่ 6 เดือนเท่ากับร้อยละ 40.5 กลุ่มตัวอย่างที่เลิกสูบบุหรี่อย่างต่อเนื่อง 6 เดือน มีคะแนนคุณภาพชีวิตด้านสุขภาพสูงกว่ากลุ่มที่ยังคงสูบบุหรี่อย่างมีนัยสำคัญทางสถิติ พยาบาลเป็นบุคลากรที่มีบทบาทสำคัญยิ่งทีมสุขภาพ ในการปฏิบัติการพยาบาลเพื่อส่งเสริมการเลิกบุหรี่นั้น พยาบาลสามารถปฏิบัติได้หลากหลายวิธี อาทิ การให้คำแนะนำและบำบัดเพื่อเลิกบุหรี่แบบกระชับหรือส่งต่อเพื่อการบำบัดขั้นสูง อีกทั้งควรพิจารณาประเมินคุณภาพชีวิตด้านสุขภาพของผู้สูบบุหรี่และใช้ข้อมูลดังกล่าวในการชี้แนะเพื่อเลิกบุหรี่

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คำสำคัญ: คุณภาพชีวิตด้านสุขภาพ เลิกบุหรี่ การเลิกบุหรี่ ประเทศไทย

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Prevalence and Predictors of Sarcopenia in Older People with Type 2 Diabetes

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Abstract: Sarcopenia is associated with loss of muscle mass and muscle strength, causing poor physical performance and falls; however, research about this is still limited in Thailand, particularly in older people with type 2 diabetes mellitus. This study investigated the prevalence of sarcopenia, and its components (muscle mass, handgrip strength and gait speed) associations with personal factors (age, gender, co-morbidity and time since diagnosis), and health and behavioral factors (hemoglobin A1c, body mass index, waist circumference, depression and physical activity) in older people with type 2 diabetes mellitus. Data were collected from 396 older people residing in Bangkok and surrounding areas using structured interviews, nutrition and health assessment, body composition analyzer, handgrip dynamometer and a 6-meter walk test. Descriptive statistics and univariate and multivariate logistic regression were used to analyze the data.

Results revealed that the prevalence of sarcopenia was 1.3%. The univariate logistic regression indicated that age and gender were significantly associated with handgrip strength and gait speed. Body mass index and waist circumference were significantly associated with only handgrip strength; while depression and physical activity were significantly associated with handgrip strength and gait speed. The multivariate logistic regression showed that age, gender and waist circumference could together predict handgrip strength. Moreover, age, gender, depression and physical activity together predicted gait speed. Nurses need to promote physical activity, monitor depression and provide advice to older people to help control their body weight and visceral fat.

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Background

The aging population is currently increasing worldwide as well as in Thailand, a Southeast Asian country. It has been estimated that the Thai population will soon become a super-aged society.[1] With advancing age, older people are at risks for a significant decrease

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in muscle mass, and increase in fat mass particularly visceral fat,[2] resulting in a high risk of insulin resistance and type 2 diabetes mellitus (T2DM),[3] a common public health problem among Thai older people.[4] According to the Fifth Thai National Health Examination Survey (NHES V), insulin resistance, T2DM, and metabolic syndrome lead to a decline in muscle mass associated with sarcopenia.[4]

Sarcopenia is considered a syndrome associated with older people.[5] The literature revealed that major factors causing sarcopenia in older people with T2DM are biological or personal factors. Age-related physiological changes lead to muscle wasting and loss of ability to restore and rebuild muscle.[3,5,6] In addition, females generally have less muscle mass associated with a decrease in hormone, thus, they are more likely to have sarcopenia than males.[5] Co-morbidity also leads to functional decline, involving inflammatory processes and endocrine function.[5,7] Thus, the more co-morbidities, the less physical fitness[8] and a longer time since diagnosis of diabetes results in more insulin resistance and protein degradation in muscle. [9,10,11]

Among older people with T2DM, health indicators associated with sarcopenia are that hemoglobin A1c indicates the severity of hyperglycemia, leading to an increase in the formation of advanced glycation end products (AGEs) that accumulate in cartilage and skeletal muscle, causing lower handgrip strength, and gait speed together with moderate-to-severe physical impairments.[12] Low body mass index (BMI) is associated with inadequate dietary protein intake[14] whereas being overweight or obese link with inflammatory cytokines, causing losses of muscle strength and muscle mass, leading to sarcopenia.[11,12,15] Waist ci rcumference (WC) and depression affect immune-mediated inflammation and increase inflammatory cytokines IL-6 and TNF-α, and C-reactive protein production.[14,16,17] These cytokines play a major role in the process of muscle breakdown that causes muscle loss and sarcopenia.[5,18] Also, physical inactivity is a leading cause of reduced muscle mass and muscle strength.[19,20]

The prevalence of low muscle mass was found to be 5-13% in older people, and increased to 50% in those at the age of ≥80 years.[21] Moreover, insulin resistance can lead to decreased muscle, increased gluconeogenesis and hyperglycemia,[22] causing sarcopenia among those with T2DM.[12,13] The major consequences of sarcopenia include low physical performance, risks of fall, frailty and bone fracture,[21] a decline in daily activity, increased needs of assistance with self-care, along with medical treatment, prolonged hospitalization associated with infection, readmission, and premature mortality.[23]

According to previous studies in Thai older people, the prevalence of sarcopenia was 30.5%[24] and 13.6%[14] in community dwellers, while it was 9.6% in urban communities.[25] T2DM is associated with an increased risk of impaired muscle strength and performance in older people[12] with the possibility of developing frailty and sarcopenia, which are preventable.[26] Studies on sarcopenia in Thai older people with T2DM are scarce, and so the authors believed it was necessary to describe the prevalence of sarcopenia and examine factors associated with it, so as to develop strategies to prevent or delay its development.

Aims

This study aimed to 1) describe the prevalence of sarcopenia in older people with T2DM, and 2) investigate the relationship and predictability of personal factors (age, gender, co-morbidity and time since diagnosis) and health and behavioral factors (hemoglobin A1c, body mass index (BMI), waist circumference (WC), depression and physical activity) with each component of sarcopenia (muscle mass, handgrip strength and gait speed) in older people with T2DM in Thailand.

Methods

Design

This study used a descriptive correlational design.

Sample

Through purposive sampling, the sample consisted of older people with T2DM aged ≥60 years who resided in six communities in Bangkok Metropolitan Region (BMR) and surrounding areas between December 2017-April 2018. The inclusion criteria were: 1) being diagnosed with T2DM for at least 1 year; 2) Having normal cognitive status as screened by the Chula mental test[30] with score of ≥15; 3) Being ambulatory with no need for walkers or assistive equipment; 4) Not having severe diabetes complications; and 5) Having blood pressure ≤140/90 mm Hg. Exclusion criteria included 1) having contraindication for the walking test; 2) Having musculoskeletal disorders; and 3) Taking steroids and thyroid hormones that might affect body weight or body composition.

The sample size determination in this study was based on the formula of Kelsey, Whittemore, Evans & Thompson (1996)[27] which is $n = Z\sigma^2 z/L^2 = 1.96 \times 10^2 = 384$ where: n = sample size; Z = probability of type I error at .05 = 1.96; σ = variance; L^2 = acceptable error for the estimation of sample mean = .01, obtaining a sample of 384. Approximately 3% was added for incomplete data; therefore, the final sample was 396.

Instruments

Four questionnaires were used with permissions from original authors. The content validity was examined by three experts in nutrition, geriatric care and community-based diabetic care. Instruments used were:

1) Screening tools:

Cognitive Screening Instrument: The Chula Mental Test (CMT) developed by Jitapunkul,[28] was used to screen for cognitive function by asking potential participants to respond to 19 questions such as "how old are you?" and "what time is it?". The score for a correct answer was 1 and an incorrect answer was 0. Possible scores ranged from 0-19. Those with the total score <15 were considered to have cognitive impairment and excluded from the study. Psychometric properties of the CMT were tested, revealing that content validity, criterion validity and reliability coefficient were acceptable.[28]

A *digital sphygmomanometer* was used to measure blood pressure (BP) in each potential participant in a resting position for at least 15 minutes. The inclusion criteria was less than 140/90 mmHg.[29]

2) The Personal Factors Questionnaire, developed by the researchers based on a literature review, was used to collect data on age in years, gender, co-morbidity (as described by numbers of underlying diseases other than T2DM), time since diagnosis in years, marital status, religion, education level, occupation, personal income, family income, numbers of family members, medication type, weight loss status, changes in food intake, and fall history in the past year.

3) Assessment tools for health and behavioral factors

Assessment of health and behavioral factors included two questionnaires and tools assessing nutritional status.

Thai Geriatric Depression Scale (TGDS), developed by Train the Brain Forum Committee,[30] was used to assess depression within the past week. This has 30 items including 20 negative questions (such as "Have you dropped many of your activities and interests?") and 10 positive questions (such as "Are you basically satisfied with your life?"). Response to items is a "yes" or "no". For negative questions, the response is scored as 1 if the answer is "yes" and as 0 if the answer is "no". The score is reversed for the positive questions. The possible scores range from 0-30 and are classified into 4 levels: normal (0-12), mild depression (13-18), moderate depression (19-24); and severe depression (25-30). Later in the logistic regression analysis, the scores are combined and classified into 2 groups (0=normal; 1=depressed). Cronbach's alpha coefficients for the original TGDS and this study were .91, and .75, respectively.

The *Global Physical Activity Questionnaire (GPAQ) version 2* was developed by the World Health Organization (WHO) and translated in Thai by Aekplakorn,[4] and has 16 items with three dimensions of physical activity: work (6 items); transportation (walking and cycling: 3 items); and leisure (recreational activity: 6 items and sedentary activity: 1 item). The questions ask the intensity of physical activity (moderate or vigorous), duration (min/day), and frequency of activity (day/week). According to intensity levels, data are then converted to Metabolic Equivalent Tasks (METs) by calculating total time spent in each physical activity during a week, then multiply by 4 for moderate and 8 for vigorous intensity, obtaining a MET value based on each intensity. Total physical activity refers to the total MET value (MET-min/week), and is classified into three levels: 1) vigorous (≥ 3 days/week of vigorous-intensity physical activity and total MET ≥1500 METs-min/week; or ≥7 days/week of either moderate or vigorous intensity physical activity and total MET ≥3000 METs-min/week); 2) moderate (≥ 3 days/week of vigorous-intensity physical activity for ≥ 20 minutes per day; or ≥5 days per week for at least 30 minutes per day; or ≥5 days per week of either moderate or vigorous intensity physical activity and total MET ≥600 METs-min/week); and 3) sedentary and light (lower than moderate level of total physical activity). The Item Content Validity Index (I-CVI) was 1.00 indicating the I-CVI was acceptable according to Lynn.[31] In a 1-week interval, the test-retest reliability from a pilot-test with 30 older people was .89.

Tools assessing nutritional status included body composition analyzer, height meter and non-stretchable nylon tape. *Body weight* was measured in kilograms (kg) using a body composition analyzer (TANITA-420) with monthly calibration in which the participants were asked to wear light clothing with barefoot and stand on the analyzer. *Height* was measured to the nearest 0.1 cm using a height meter fixed to the wall where the participants were asked to take a standing position without shoes. *Body mass index (*BMI*)* was calculated using the formula weight (kg)/Height (meter^2). Interpretation was based on the WHO Western Pacific Region standard[32] as classified into underweight (<18.5 kg/m^2), normal (18.5-22.9 kg/m^2), overweight (23-24.9 kg/m^2), obesity class I (25-29.9 kg/m^2), and obesity class II (≥ 30 kg/m^2). *Waist circumference (WC)* was measured using the same standard[32] in which a non-stretch tape was used to measure WC in a horizontal plane at the level of the middle between the lower margin of the lowest rib and the iliac crest to the nearest 0.1 cm. Participants were classified into "central obesity" when WC >90 cm in the male and WC >80 cm in the female. *Hemoglobin A1C and blood glucose level data* were collected from the patients' medical records, while participants, who did not have the previous record, had their hemoglobin A1c measured at the health service.

4) Assessment tools for sarcopenia

Muscle mass was measured using a body composition analyzer (TANITA-420) with monthly calibration as calculated from: skeletal muscle mass (SM) = [0.401x (height^2/resistance) + 3.825 x gender - 0.071 x age + 5.102], where height was in cm and resistance in ohms; gender was coded for female (0) and male (1); age was in years. Skeletal muscle mass index (SMI) was based on SM/ height^2. Low muscle mass was classified as SMI < 7.0 kg/m^2 in male and < 5.7 kg/m^2 in female.[7] *Handgrip strength* was measured using a digital handgrip dynamometer based on ISO-standard. Participants were asked to exert maximum effort twice using their dominant hand, then the average was used for data analysis. Low handgrip strength was defined as <26 kg in male and <18 kg in female.[7] *Gait speed* was measured using a stopwatch and a 6-meter walk. The participants were asked to stand with their toes touching the start line then walk at a usual pace a few steps beyond the finish line. One of the research assistants walked with each participant to prevent them from falling or any accident. The time to finish a 6-meter walk was recorded in seconds. The gait speed was then calculated in meter/second. Low gait speed was defined as ≤0.8 meters/second in both male and female.[7] Interrater reliability was tested with greater than .80 prior to the gait speed measurement.

The Asian Working Group for Sarcopenia (AWGS) criteria were used to identify sarcopenia severity three levels: 1) Pre-sarcopenia refers to low muscle mass solely, 2) sarcopenia refers to low muscle mass with low handgrip strength or low gait speed, and 3) severe sarcopenia refers to low muscle mass, low handgrip strength and low gait speed.[7]

Ethical Considerations

This study was approved by the Institutional Review Board on Research Involving Human Subjects of the Faculty of Medicine, Ramathibodi Hospital (ID 09-60-14) and the Faculty of Medicine Siriraj Hospital, Mahidol University (Protocol number 820/2560 EC4). Data were collected according to the principle of protecting the rights of human subjects. The participants were asked to sign the informed consent form to indicate their willingness to participate in the study as well as their right to withdraw, and assurances of privacy and confidentiality.

Data collection

The data were collected using a structured interview, nutritional assessment, body composition analyzer, handgrip dynamometer and a 6-meter walk test. There were five research assistants (RIs) consisting of three professional nurses and two public health volunteers. These RIs were well-trained and well-instructed to ensure consistency of data collection which was undertaken at four stations. Station 1 was registration, measurements of blood pressure, and cognitive screening. Three older people did not meet cognitive screening criteria. Station 2 was a measurement of height and waist circumference. The participants then responded to the questionnaires through structured interview lasting approximately 20 minutes per participant. Station 3 was for body weight, body composition, and hand grip strength test and Station 4 was for the 6-meter gait speed test.

Data analysis

Descriptive statistics were used to analyze data regarding personal information, health and behavioral factors, and components and prevalence of sarcopenia. Univariate logistic regression examined associations of personal factors (age, gender, co-morbidity and time since diagnosis), and health and behavioral factors (Hemoglobin A1c, BMI, waist circumference, depression and physical activity) with each component of sarcopenia, comprising of muscle mass, handgrip strength and gait speed. The personal factors were categorized including age (0=60-69; 1=70-79; 2= ≥80 years), and gender (0=female; 1=male) while co-morbidity and time since diagnosis were measured as continuous scale. The health and behavioral factors were classified to include BMI (0= <18.5; 1=18.5-22.9; 2=23-24.9; 3=25-29.9; 4=≥30 kg/m^2), waist circumference (0=normal; 1=excessive), depression (0=normal; 1=depressed), and physical activity (0=sedentary and light; 1=moderate; 2=vigorous), while hemoglobin A1c was measured as continuous scale. Multivariate logistic regression was used to examine personal factors and health and behavioral factors together predicting handgrip strength and gait speed in participants. Assumptions were met.[33]

Results

The majority of participants were female (75.5%) with a mean age of 68.6 ± 6.8 years, ranging from 60-89 years (Table 1). Half of them lived in Bangkok (50.8%); 52% were married and 55.1% were from an extended family. Most were Buddhists (98.4%), had primary education or lower (76%), and did not work (63.8%). Their income was mainly from welfare benefits for older people and allowances from the relatives with a median income of 2,700 baht per month (82 USD), while the median household income was 10,000 baht per month (305 USD).

The median time since diagnosis of T2DM was 10 years, ranging from 1-26 years. Approximately 52% had their blood glucose level at or below 130 mg/dl; and 54.3% had their hemoglobinA1c within the normal range (< 7 %). Most took only an oral antidiabetic drug (93.6%), had no experience of weight loss (86.6%), and no changes in food intake (73.5%) with comorbidities (93.2%). The most common health problems were hypertension (81.8%) and dyslipidemia (61.9%).

Participants had sedentary and light physical activity mostly at the highest rank (44%), following by a moderate level (37.6%) (Table 1). In terms of mental health, 85.1% had no depression, while 11.1% had mild depression and 3.8% had moderate to severe depression. Regarding nutritional status, only 21.8% had a normal BMI while 37.9% had obesity (class I) and 19.9% were overweight; 88% of females and 57.7% of males had excessive waist circumference.

According to the AWGS criteria[7], only 5 female participants (1.3%) had sarcopenia. Among these, four had severe sarcopenia and one had sarcopenia. The majority (98.7%) had normal muscle mass, 55.3% had normal handgrip strength and 44.7% had low handgrip strength, while 66.2% had low gait speed (Table 2).

Table 1 Description of the study variables (n = 396)

Variables	Mean ± SD	n (%)
Age (years)	68.6 ± 6.8	
Gender		
Female		299 (75.5)
male		97 (24.5)
Co-morbidity (number of underlying diseases)		
Diabetes only		27 (6.8)
1		139 (35.2)
2		197 (49.7)
3		29 (7.3)
4		4 (1.0)
Time since diagnosis (years)	9.7 ± 7.2	
Hemoglobin A1c (mg%)	7.1 ± 1.6	
Body mass index (kg/m^2)	26.2 ± 4.6	
Waist circumference (cm)		
Male	92.9 ± 9.9	
Female	90.6 ± 9.9	
Depression	7.1 ± 5.1	
Physical activity		
Sedentary and light		174 (44.0)
Moderately		149 (37.6)
Vigorous		73 (18.4)

Table 2 Components of sarcopenia in the participants based on the Asian Work Group for Sarcopenia (AWGS) Criteria (n=396)

Components of sarcopenia	Male	Female	All
	n (%)	n (%)	n (%)
Muscle mass			
Normal	97 (24.5)	294 (74.2)	391 (98.7)
Low	-	5 (1.3)	5 (1.3)
Handgrip strength			
Normal	64 (16.2)	155 (39.1)	219 (55.3)
Low	33 (8.3)	144 (36.4)	177 (44.7)
Gait speed			
Normal	48 (12.1)	86 (21.7)	134 (33.8)
Low	49 (12.4)	213 (53.8)	262 (66.2)
Sarcopenia			
No	97 (24.5)	294 (74.2)	391 (98.7)
Yes	-	5 (1.3)	5 (1.3)
Pre-sarcopenia	-	-	-
Sarcopenia	-	1 (0.3)	1 (0.3)
Severe sarcopenia	-	4 (1.0)	4 (1.0)

Due to the low prevalence of sarcopenia in older people with T2DM, we were unable to perform the statistical analysis as previously planned. Consequently, we changed an initial main variable from "sarcopenia" to "components of sarcopenia", comprised of muscle mass, handgrip strength and gait speed based on the AWGS criteria. Afterward, we examined associations of personal factors (age, gender, co-morbidity and time since diagnosis), and health and behavioral factors (hemoglobin A1c, BMI, WC, depression and physical activity) with each sarcopenia component.

Univariate logistic regression revealed that all personal, health and behavioral factors were not significantly associated with muscle mass. However, personal factors (age and gender), and health and behavioral factors (body mass index, waist circumference, depression and physical activity) were significantly associated with handgrip strength. The participants with severe depression were more likely to have low handgrip strength, while females were less likely to have low handgrip strength. However, co-morbidity, time since diagnosis and hemoglobin A1c were not significantly associated with handgrip strength (Table 3).

Table 3 Univariate Logistic Regression examining factors associated with handgrip strength in the participants (n=396)

Factors	Normal handgrip strength n (%)	Low handgrip strength n (%)	B	OR	95% CI	p
Age			.080	1.083	1.050-1.118	<.001
Gender			-.589	.555	.344-.895	.016
Female*	155 (51.8)	144 (48.2)				
male	64 (66.0)	33 (34.0)				
Co-morbidity			.207	1.230	.946-1.599	.122^{ns}
Time since diagnosis			.014	1.014	.968-1.042	.333^{ns}
Hemoglobin A1c			.043	1.044	.921-1.184	.501^{ns}
Body mass index			-.047	.954	.913-.998	.039
Waist circumference			-.031	.970	.950-.990	.003
Depression			.081	1.084	1.040-1.130	<.001
Physical activity			-.281	.755	.577-.987	.040
Sedentary and light*	86 (49.4)	88 (50.6)				
Moderate	87 (58.8)	61 (41.2)				
Vigorous	46 (62.2)	28 (37.8)				

OR=Odd ratio, CI=Confident interval; ns= No statistical significance

*Reference group

Personal factors (age and gender) and health and behavioral factors (depression and physical activity) were significantly associated with gait speed. The participants with severe depression were more likely to have low handgrip strength, while female gender was less likely to have low handgrip strength. However, co-morbidity, time since diagnosis, hemoglobin A1c, BMI and waist circumference were not significantly associated with gait speed (Table 4).

Multiple logistic regression analysis revealed that three out of nine factors (age, gender and waist circumference) together could predict handgrip strength with 15.8% of the variance in handgrip strength (Table 5). Participants aged ≥80 years were 5 times more likely to have low handgrip strength than those aged 60-69 and 70-79 years (95% CI 2.198-11.364). Females were 0.5 times more likely to have low handgrip strength than males (95% CI 0.286-0.876). Participants with waist circumference ≤80 cm in females or ≤90 cm in males were 0.5 times more likely to have low handgrip strength than those with excessive waist circumference (95% CI 0.257-0.987) when controlling for other variables (Table 5).

Table 4 Univariate Logistic Regression examining factors associated with gait speed in the participants (n=396)

Factors	Normal gait speed n (%)	Low gait speed n (%)	B	OR	95% CI	p
Age			.082	1.085	1.047-1.124	<.001
Gender			-.886	.412	.258-.660	<.001
Female*	86 (28.8)	213 (71.2)				
male	48 (49.5)	49 (50.5)				
Co-morbidity			.239	1.269	.963-1.673	.090^{ns}
Time since diagnosis			.010	1.010	.981-1.040	.502^{ns}
Hemoglobin A1c			.018	1.019	.892-1.164	.786^{ns}
Body mass index			.004	1.004	.959-1.051	.858^{ns}
Waist circumference			-.019	.981	.961-1.002	.083^{ns}
Depression			.092	1.096	1.044-1.150	<.001
Physical activity			-.281	.621	.470-.822	.001
Sedentary and light *	45 (25.9)	129 (74.1)				
Moderate	54 (36.5)	94 (63.5)				
Vigorous	35 (47.3)	39 (52.7)				

OR=Odd ratio, CI=Confident interval; ns= No statistical significance
*Reference group

Table 5 Multivariate Logistic Regression examining factors associated with handgrip strength in the participants (n=396)

Factors	B	OR	95% CI	p
Age (years)				
60-69*				
70-79				
> 80	1.609	4.998	2.198-11.364	<.001
Gender				
Female*	-.692	.500	.286-.876	.015
male				
Waist circumference				
Normal*	-.686	.504	.257-.987	.046
Excessive				

Nagelkerke R^2 = .158; -2LL= 237.511; x^2 = 49.765; df=11; p<.001
OR=Odds ratio, CI=Confidence interval
*Reference group

Additionally, four out of nine factors (age, gender, depression and physical activity) together could predict gait speed with 14.2% the variance in gait speed (Table 6). Participants ≥80 years were 4.2 times more likely to have low gait speed than those 60-69 and 70-79 years (95% CI 1.529-11.300). Females were 0.5 times more likely to have low gait speed than male gender (95% CI 0.285-0.763). Participants with depression were 2.2 times more likely to have low gait speed than those with no depression (95% CI 1.068-4.527), and those with sedentary and light physical activity were 0.4 times more likely to have low gait speed than those with moderate and vigorous activity (95% CI 0.240-0.792) when controlling for other variables (Table 6).

Table 6 Multivariate Logistic Regression examining factors associated with gait speed in the participants (n=396)

Factors	B	OR	95% CI	p
Age (years)				
60-69*				
70-79				
> 80	1.425	4.157	1.529-11.300	.005
Gender				
Female*	-.762	.467	.285-.763	.002
male				
Depression				
No*				
Yes	.788	2.198	1.068-4.527	.033
Physical activity				
Sedentary and light *	-.831	.436	.240-.792	.006
Moderate				
Vigorous				

Nagelkerke R^2 = .142; -2LL= 82.733; x^2 = 42.677; df=6; p<.001

OR=Odd ratios, CI=Confidence interval

*Reference group

Discussion

The prevalence of sarcopenia in this study was lower than previous studies conducted in community-dwelling Thai older people that reported prevalences of 13.6%[14], and 9.6%,[25] while the prevalence of sarcopenia in older people with type 2 diabetes mellitus was 14.8% in China[35], and about 15.2% in Japan.[10] This could explained by the fact that the majority of the participants in our study were in the young-old group who took only antidiabetic drugs, had no experience with weight loss, normal blood glucose level and hemoglobin A1c, no change of food intake, no fall history in the past year, and undertook vigorous or moderate physical activity. Additionally, the participants in previous studies were at greater average age[10,14,25,35], with longer time since diagnosis and poorer hemoglobin A1c.[10,35]

Multivariate logistic regression revealed that the two personal factors, age and gender, and one of health and behavioral factors, waist circumference, were the best predictors of handgrip strength with overall predictive power of 15.8% (Table 5), whereas the best predictor of gait speed was age following by depression, gender and physical activity with overall predictive power of 14.2 % (Table 6). The four predictive factors of gait speed were two personal factors, age and gender, and two of health and behavioral factors, depression and physical activity.

The strongest predictor of handgrip strength and gait speed in this study was of age being ≥80 years. Most of the participants with low handgrip strength (73%) and low gait speed were aged being ≥ 80 years. This result could be explained by the mechanism of age-related physical changes suggesting that muscle wasting and the loss of ability to restore and rebuild lost muscle is related with the aging process.[3,5,6] This was consistent with previous studies, indicating that aging-related biological changes could result in sarcopenia.[15,21,24]

Being female (a personal factor) was the second-best predictor of handgrip strength and the third-best predictor of gait speed. This indicates that females are more likely to have sarcopenia than males because they generally have less muscle mass than males,[5,9] and their hormonal levels decrease with advancing age, leading to muscle loss.[5,6] This was consistent with previous studies[14,15] indicating that sarcopenia is more common among females than males. The second-best predictor of gait speed was depression, a health and behavioral factor. This is also consistent with other studies,[14,18] indicating that changes in the hypothalamic-pituitary-adrenal axis affect immune-mediated inflammation and the increased inflammatory cytokines IL-6 and TNF-α stimulate CRP (C - reactive protein) production in those with severe depression. These cytokines play a major role in the process of muscle breakdown, causing muscle loss and leading to sarcopenia.[5]

The third-best predictor of handgrip strength was waist circumference ≤80 cm in females and ≤90 cm in male. This result is consistent with theories of the nutrition-related sarcopenia resulting from energy insufficient.[5] Hyperglycemia, common in diabetes, is associated with loss of muscle mass and strength because of weight loss.[34] Insulin resistance caus es the body to lose energy by moving glucose to the body cells, resulting in burning body fat and muscle.[13,22] Again this result is consistent with previous studies.[17,18]

Physical activity, a health and behavioral factor, was the fourth-best predictor of gait speed. This may be due to physical changes in aging process[2], indicating that older people with physical inactivity have more reduction of muscle mass and muscle strength, leading to sarcopenia[5,6] at 1.33 times a higher rate than those with adequate physical activity,[19] and while older people with moderate to vigorous physical activity have a lower risk for sarcopenia.[20]

As described in Table 2, all five participants with sarcopenia were female. Four of them had severe sarcopenia, and two of the four were in the old-old age (≥ 80 years old) and were depressed. In addition, one of these participants in the old-old age had 5 times the number of falls previously within one year.

Results in this study indicated that low handgrip strength was a powerful component of sarcopenia in older people with T2DM. The European Working Group on Sarcopenia in Older People in 2019[36] recommended that low handgrip strength is the primary indicator of sarcopenia in order to evaluate muscle quality and determine the feature of sarcopenia; whilst gait speed is also used to measure physical performance for categorizing the severity of sarcopenia.[36]

Study limitations

This study used a cross-sectional descriptive design, thus, a conclusion in terms of causal relationship is limited. Data collected for protein intake in food consumption record may have lacked accuracy. Probability sampling was not used; therefore, generalizability is limited only for older people with type 2 diabetes mellitus whose demographic and clinical characteristics are similar to the study sample.

Conclusions and recommendations for nursing practice and further research

The prevalence of sarcopenia in this study was 1.3%. Among personal factors, it was found that age was strongly associated with the two components of sarcopenia including handgrip strength and gait speed, followed by depression, waist circumference and physical activity. The results suggest that nurses and health teams need to screen for early detection of sarcopenia and enhance health behavioral modifications by promoting physical activity. Emphasis should placed on monitoring depression and providing advice aimed to control people's visceral fat, particularly in females at old-old age with T2DM. Nurses and health teams could also utilize data from this study as baseline information to further develop strategies for behavioral modification to ensure appropriate nutrition, and proper physical activity in order to prevent sarcopenia among older people, and for future study.

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References

1. The Office of Permanent Secretary for Ministry of Social Development and Human Security. ASEAN aging population 2016 ;2016[Cited 2017 January 29]. Available from http://ebooks.m-society.go.th/ebooks/view/196
2. Batsis JA, Villareal DT. Sarcopenic obesity in older adults: aetiology, epidemiology and treatment strategies. Nature Reviews Endocrinology. 2018:1.
3. Miljkovic N, Lim JY, Miljkovic I, Frontera WR. Aging of skeletal muscle fibers. Annals of Rehabilitation Medicine. 2015;39(2):155-62.
4. Aekplakorn W. (Eds.). The Fifth Thai National Health Examination Survey (NHES V). Nonthaburi, TH: Health Systems Research Institute;2014. [in Thai].
5. Cruz-Jentoft AJ, Montero-Errasquín B. Sarcopenia. In: Roller-Wirnsberger R, Singler K, Polidori MC, editors. Learning geriatric medicine: a study guide for medical students. Cham: Springer International Publishing; 2018. p. 99-105.
6. Limpawattana P, Kotruchin P, Pongchaiyakul C. Sarcopenia in Asia. Osteoporosis and Sarcopenia. 2015;1(2):92-7.
7. Chen L-K, Lee W-J, Peng L-N, Liu L-K, Arai H, Akishita M. Recent advances in sarcopenia research in Asia: 2016 update from the Asian Working Group for Sarcopenia. Journal of the American Medical Directors Association. 2016;17(8): 767.e1-. e7
8. Li CI, Li TC, Lin WY, Liu CS, Hsu CC, Hsiung CA, et al. Combined association of chronic disease and low skeletal muscle mass with physical performance in older adults in the Sarcopenia and Translational Aging Research in Taiwan (START) study. BMC Geriatr. 2015;15.
9. Kim KS, Park KS, Kim MJ, Kim SK, Cho YW, Park SW. Type 2 diabetes is associated with low muscle mass in older adults. Geriatrics & Gerontology International. 2014;14 Suppl 1:115-21.
10. Murata Y, Kadoya Y, Yamada S, Sanke T. Sarcopenia in elderly patients with type 2 diabetes mellitus: prevalence and related clinical factors. Diabetology International. 2018; 9(2):136-42.
11. Kim JH, Ahn HJ, Yang TY, Kim SY. Sarcopenic obesity and associated factors in older adults with diabetes: the 2009-2010 Korean National Health and Nutrition Examination Survey. Endocrine Abstracts. 2017; 49. GP162.
12. Jang HC. Sarcopenia, frailty, and diabetes in older adults. Diabetes & Metabolism Journal. 2016;40(3):182-9.
13. Mogi M, Horiuchi M. Diabetes and sarcopenia. In: Yamagishi S-i, editor. Diabetes and aging-related complications. Singapore: Springer Singapore; 2018. p. 141-51.
14. Thiengtham S, Somboontanont W, Leelahakul V, Hiengkaew V. Physical activity, nutritional status and depression related to sarcopenia community dwelling older adults, Journal of Nursing Science & Health. 2015; 38(4): 10. [in Thai].
15. Han P., Kang L, Guo Q, Wang J, Zhang W., Shen S, et al. Prevalence and factors associated with sarcopenia in suburb-dwelling older Chinese using the Asian Working Group for Sarcopenia definition. J Gerontol A Biol Sci Med Sci. 2016; 71(4): 529-535.
16. Bian A-L, Hu H-Y, Rong Y-D, Wang J, Wang J-X, Zhou X-Z. A study on relationship between elderly sarcopenia and inflammatory factors IL-6 and TNF-α. European Journal of Medical Research. 2017;22(1):25.
17. Wu CH, Chen KT, Hou MT, Chang YF, Chang CS, Liu PY. Prevalence and associated factors of sarcopenia and severe sarcopenia in older Taiwanese living in rural community: the Tianliao old people study 04. Geriatrics & Gerontology International. 2014;14 Suppl 1:69-75.
18. Ishii S, Chang C, Tanaka T, Kuroda A, Tsuji T, Akishita M, et al. The association between sarcopenic obesity and depressive symptoms in older Japanese adults. PLoS ONE. 2016; 11(9): e0162898.

19. Gianoudis J, Bailey CA, Daly RM. Associations between sedentary behaviour and body composition, muscle function and sarcopenia in community-dwelling older adults. Osteoporosis International. 2015;26(2): 571-9.
20. Steffl M, Bohannon RW, Sontakova L, Tufano JJ, Shiells K, Holmerova I. Relationship between sarcopenia and physical activity in older people: a systematic review and meta-analysis. Clinical Interventions in Aging. 2017; 12:835-45.
21. Pongchaiyakul C, Limpawattana P, Kotruchin P, Rajatanavin R. Prevalence of sarcopenia and associated factors among Thai population. Journal of Bone and Mineral Metabolism. 2013;31(3):346-50.
22. Umegaki H. Sarcopenia and diabetes: hyperglycemia is a risk factor for age-associated muscle mass and functional reduction. Journal of Diabetes Investigation. 2015;6(6):623-4.
23. Beaudart C, Rizzoli R, Bruyère O, Reginster JY, Biver E. Sarcopenia: burden and challenges for public health. Archives of Public Health. 2014;72.
24. Khongsri N, Tongsuntud S, Limampai P, Kuptniratsaikul V. The prevalence of sarcopenia and related factors in a community-dwelling elders Thai population. Osteoporosis and Sarcopenia. 2016;2(2):110-5.
25. Promklang D, Piaseu N, Maruo SJ, Tantiprasoplap S. Factors associated with sarcopenia amongst older adults in congested communities in Bangkok. Thai Journal of Nursing Council. 2018; 33(1): 49-6. [in Thai].
26. Limpawattana P, Assantachai P, Krairit O, Kengkijkosol T, Wittayakom W, Pimporm J, et al. The predictors of skeletal muscle mass among young Thai adults: a study in the rural area of Thailand. Biomedical Research (India). 2016;27(1): 29-33.
27. Kelsey JL, Whittemore AS, Evans AS, Thompson WD. Methods in observational epidemiology. New York: Oxford University Press; 1996.
28. Jitapunkul S. Principles of geriatric medicine. In: Jitapunkul S., editor. Analysis of geriatric. Bangkok: Chulalongkorn University;1998. p. 88-89.
29. The Thai Hypertension Society. Thai guidelines on the treatment of hypertension update 2015. Trickthink Printing, Chiangmai; 2015.
30. Poungvarin N. Thai geriatric depression scale. Siriraj Medical Journal. 1994; 46(1): 7-11.
31. Grove SK, Burns N, Gray J. The practice of nursing research: appraisal, synthesis, and generation of evidence 7th ed. St. Louis, MO: Elsevier Saunders; 2013.
32. Wirojratana V, Leelahakul V, Khumtaveeporn P, Punsakd W. health promoting behaviors and health risks of the elderly in the health promotion center at faculty of nursing, Mahidol University. Thai Journal of Nursing Council. 2011; 26:140-153. [in Thai].
33. Statistics Solutions. Assumptions of logistic regression; 2018[Cited 2019 February 25]. Available from www.statisticssolutions.com/assumptions-of-logistic-regression/
34. Morley JE, Malmstrom TK, Rodriguez-Manas L, Sinclair AJ. Frailty, sarcopenia and diabetes. J Am Med Dir Assoc. 2014;15(12):853-9.
35. Wang T, Feng X, Zhou J, Gong H, Xia S, Wei Q, et al. Type 2 diabetes mellitus is associated with increased risks of sarcopenia and pre-sarcopenia in Chinese elderly. Scientific Reports. 2016;6.
36. Cruz-Jentoft AJ, Bahat G, Bauer J, Boirie Y, Bruyere O, Cederholm T, et al. Sarcopenia: revised European consensus on definition and diagnosis. Age Ageing. 2019;48(1):16-31.

ความชุกของภาวะมวลกล้ามเนื้อน้อยและปัจจัยในผู้สูงอายุที่เป็นเบาหวานชนิดที่ 2

บงกช วิริยะ นพวรรณ เปียซื่อ นรีมาลย์ นีละไพจิตร สุกัญญา ตันติประสพลาภ*

บทคัดย่อ: ภาวะมวลกล้ามเนื้อน้อยเกี่ยวข้องกับการสูญเสียมวลกล้ามเนื้อและความแข็งแรงของกล้ามเนื้อ เป็นสาเหตุสำคัญของสมรรถภาพทางกายลดลงและการหกล้ม แต่การศึกษาภาวะมวลกล้ามเนื้อน้อยในผู้สูงอายุของไทยยังมีจำกัดโดยเฉพาะในผู้สูงอายุที่เป็นเบาหวานชนิดที่ 2 การศึกษาครั้งนี้ มีวัตถุประสงค์เพื่อศึกษาความชุกของภาวะมวลกล้ามเนื้อน้อยและความสัมพันธ์ของปัจจัยส่วนบุคคล (อายุ เพศ จำนวนโรคร่วม และระยะเวลาที่เป็นโรคเบาหวานชนิดที่ 2) ปัจจัยภาวะสุขภาพและพฤติกรรมสุขภาพ (ระดับน้ำตาลสะสมในเลือด ดัชนีมวลกาย เส้นรอบเอว ภาวะซึมเศร้า และกิจกรรมทางกาย) กับองค์ประกอบของภาวะมวลกล้ามเนื้อน้อย (มวลกล้ามเนื้อ แรงบีบมือและอัตราเร็วในการเดิน) ในผู้สูงอายุที่เป็นเบาหวานชนิดที่ 2 เก็บรวบรวมข้อมูลในผู้สูงอายุที่เป็นเบาหวานชนิดที่ 2 เขตกรุงเทพมหานครและปริมณฑล จำนวน 396 คน ด้วยการสัมภาษณ์แบบมีโครงสร้าง ประเมินภาวะโภชนาการ องค์ประกอบของร่างกาย วัดแรงบีบมือ และทดสอบการเดินปกติระยะทาง 6 เมตร วิเคราะห์ข้อมูลด้วยสถิติบรรยาย และการวิเคราะห์ถดถอยลอจิสติค

ผลการศึกษาพบว่า ความชุกของภาวะมวลกล้ามเนื้อน้อยร้อยละ 1.3 อายุ และเพศ มีความสัมพันธ์กับแรงบีบมือและอัตราเร็วในการเดิน ดัชนีมวลกาย และเส้นรอบเอว มีความสัมพันธ์กับแรงบีบมือ ส่วนภาวะซึมเศร้า และกิจกรรมทางกาย มีความสัมพันธ์กับแรงบีบมือและอัตราเร็วในการเดินอย่างมีนัยสำคัญทางสถิติ การวิเคราะห์ถดถอยลอจิสติคแบบพหุ พบว่า อายุ เพศ และเส้นรอบเอว ร่วมกันทำนายแรงบีบมืออย่างมีนัยสำคัญทางสถิติ ในขณะเดียวกันอายุ ภาวะซึมเศร้า เพศและกิจกรรมทางกาย ร่วมกันทำนายอัตราเร็วในการเดินอย่างมีนัยสำคัญทางสถิติ ผลการศึกษามีข้อเสนอแนะว่า พยาบาลควรส่งเสริมการปรับเปลี่ยนพฤติกรรม โดยส่งเสริมกิจกรรมทางกาย ติดตามภาวะซึมเศร้า ควบคุมน้ำหนักตัวและไขมันในช่องท้องของผู้สูงอายุ ให้อยู่ในเกณฑ์ที่เหมาะสม

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คำสำคัญ: ภาวะมวลกล้ามเนื้อน้อย มวลกล้ามเนื้อ อัตราเร็วในการเดิน ผู้สูงอายุ เบาหวานชนิดที่ 2 แรงบีบมือ ไทย

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A Systematic Review Protocol: the Foundation of a High Quality Systematic Review.

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Evidence based healthcare (EBHC) was once defined as being the integration between clinical expertise and the best external evidence.[1] Whilst the foundations of this premise remain true, today's understanding of EBHC has expanded to include factors such as patient preference and the context in which care is to be delivered.[2] Whilst our definitions of EBHC may change over time, the cornerstone of EBHC remains the fundamental need to be informed by the best available evidence.[1-3] Systematic reviews (SRs) remain the highest reporting standard to present this evidence.[4, 5]

An SR that is of high methodological quality, provides a rigorous and unbiased synthesis of relevant studies to summarise the currently available evidence surrounding one highly-specific topic,[6] to be utilised by those at the point of care.[4] However, not all SRs are of high methodological quality, and the subsequent utility of these findings to provide an unbiased, rigorous synthesis of information is compromised.[7] A comprehensive, cross-sectional study identified 682 SRs that were indexed in the MEDLINE database during February 2014, and were specifically asking a therapeutic question. Of this sample, 300 were randomly selected and the quality of their content and reporting was assessed. The authors concluded that the majority of these published SRs were both poorly conducted and reported, and only 16% referenced a publicly accessible protocol; the majority of this sub-set being Cochrane reviews.[7]

This is an interesting finding, as one hallmark that exemplifies an SR of high methodological quality is the development of, and adherence to, an SR protocol.[8] Having a well-written SR protocol reduces the likelihood of authors missing key steps of the review process, using extraction or appraisal tools incorrectly, and inappropriately synthesising the extracted findings.[5] International organisations such as the Joanna Briggs Institute and the Cochrane Collaboration require all SRs to be preceded by a peer-reviewed protocol.[5, 9] Whilst this is not a requirement of all journals willing to publish SRs, there are reasons why reviews linked to these organisations are considered to be some of the highest quality and functionally useful to those at the point of care. Multiple papers have previously described the structure of an SR protocol and provided guidance as to their conduct.[5, 8, 9] The purpose of this editorial is to impress that the protocol is not 'just another step' in the review process, and a published protocol can increase the overall quality of an SR.

Adhering to the same rigorous standards that ensure the SR is informed by the best available evidence, the protocol is the template on which to build an SR of high methodological quality; this starts with the

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framing of a unique question.[6] In 2015, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)[10] was extended to the PRISMA protocols (PRISMA-P) statement,[8] to guide reviewers through the process of writing and publishing an SR protocol. Both statements make it clear that a targeted and concise question leads to clear objectives and outcomes for the SR. Using the precise framework recommended for the type of SR being undertaken,[11] exhaustive inclusion and exclusion criteria can be formulated. This provides a set of guiding principles to be followed when selecting studies at title and abstract, and helps to minimise selection bias between reviewers.

When preforming title and abstract article selection, full text review and data extraction, having a protocol available that provides succinct criteria to refer to, can prove invaluable. Issues or concerns that may arise during the review process are considered at this early stage of conception, and may prevent disastrous consequences when it comes to the final stages of review writing. The protocol ensures that independent reviewers base their selection of studies on pre-formulated criteria, helping to prevent arbitrary decision making and selective reporting, consequently leading to higher quality SRs.[12] Authors are bound by the guidance laid forth in their protocol in regards to which papers are to be included or excluded, how methodological quality of these papers is to be assessed and what outcomes and study data are relevant for further analysis. Without such a safety net, these decisions could be rightly queried by the academic community. If as reviewers, we are sceptical of primary research that has been reported poorly, or where the presented results were not aligned with the stated aims and or conclusions, then we must accept that our own reviews should be subjected to the same level of scrutiny.[5]

Whilst the idea of 'establishing methods' before even starting the review process may seem counter-productive to those still dismissive to the utility of protocols, this procedure is critical in reducing the risk of 'reporting bias'. A published protocol prevents decisions made during the review process from being arbitrary.[5, 8] Reviewers may be inclined to report on only some of the information uncovered during the review process, if for example, the size and/or direction of the findings are unexpected, or perhaps one study is distinctly dissimilar in its results. Whilst reporting in this manner is not only morally wrong, the overall findings of a review, for example, the evidence on which EBHC is based, can have profound effects on healthcare and policy-related decisions.[9] Ideally, the final SR should follow the protocol exactly; however, this may not always be possible. As you progress through your SR, there may be legitimate cases in which deviations from your protocol may be necessary. Any deviation from the protocol must be justified and clearly explained in the methods section of the completed SR, in order to maintain this transparency and reduce the risk of reporting bias.[11]

The formalisation of these decisions into a peer-reviewed protocol provides a transparency of process - the cornerstone of scientific method. Finding a journal that will publish the SR protocol requires the same process as finding a journal to publish any research,[13] and although not necessarily the same journal that will publish the SR findings, journals willing to publish protocols will put SR protocols through a peer-review process. The protocol will be peer-reviewed by scholars with expertise in the field of SRs, even before the search is run,[11] and so ensures well-formulated criteria for selection of studies.

Publicly available, peer-reviewed SR protocols can produce subsequent SRs that are of high quality. This high quality hinges on the series of rigorous decisions involved in planning an SR covering eligibility criteria, methodological approach, research integrity, and search criteria, all informing the scientific process.[9] However, few published SRs are accompanied by a published protocol,[7] suggesting that most review authors seemingly 'jump right in' with the start of their review, without undergoing the appropriate planning and organisation that the rigor of the protocol process facilitates.[12] Despite the increasing requirements to abide by a review protocol from a publishing standpoint, protocols have real, functional benefits that result in higher quality SRs. These include a logical and transparent description of the rationale for undertaking a SR, the research question and hypotheses, inclusion and exclusion criteria as guided by your methodological framework, search strategy, data extraction, quality assessment, and the steps you intend to follow to undertake in your review. Specifying these methods in advance reduces the risk of introducing bias into the review. If review protocols are prepared with guidance, are informed by standards such as PRISMA-P, and have gone through the peer-review process, the resulting SR will be of significantly higher quality than a typical review.[5]

References

1. Sackett DL, Rosenberg WMC, Gray JAM, Haynes RB, Richardson WS. Evidence based medicine: what it is and what it isn›t. BMJ. 1996;312(7023):71-2.
2. Jordan Z, Lockwood C, Munn Z, Aromataris E. The updated Joanna Briggs Institute model of evidence-based healthcare. Int J Evid Based Healthc. 2019;17(1):58-71.
3. Pearson A, Jordan Z, Munn Z. Translational science and evidence-based healthcare: a clarification and reconceptualization of how knowledge is generated and used in healthcare. Nurs Res Pract. 2012;2012.
4. Aromataris E, Pearson A. The systematic review: an overview. Am J Nurs. 2014;114(3):53-8.
5. Lockwood C, Oh EG. Systematic reviews: Guidelines, tools and checklists for authors. Nurs Health Sci. 2017; 19(3):273-7.
6. Pearson A, Wiechula R, Court A, Lockwood C. The JBI model of evidence-based healthcare. Int J Evid Based Healthc. 2005;3(8):207-15.
7. Page MJ, Shamseer L, Altman DG, Tetzlaff J, Sampson M, Tricco AC, et al. Epidemiology and reporting characteristics of systematic reviews of biomedical research: a cross-sectional study. PLoS medicine. 2016;13(5):e1002028.
8. Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. Systematic reviews. 2015;4(1):1.
9. Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. BMJ. 2015;349:g7647.
10. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. PLoS Med. 2009;6(7):e1000097.
11. Joanna Briggs Institute. Reviewer›s manual. Adelaide, Australia 2014. Available from: https://wiki.joannabriggs.org/display/MANUAL/JBI+Reviewer%27s+Manual.
12. Peters MD. Not just a phase: JBI Database System Rev Implement Rep.; 2015
13. Lang TA. Choosing and communicating with journals. J of Public Health and Emerg. 2018;2(2).

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Choosing the Right Qualitative Approach: Is Phenomenography a Design for my Study?

Ponnambily Jobin, Sue Turale*

Introduction

The *Pacific Rim Journal of International Nursing Research* has published a wide range of studies utilizing different research approaches, as well as introducing to readers' descriptions of research approaches they may not have considered before. In this short methodology paper our aim is two-fold. We begin by encouraging you as the researcher or the would-be researcher to think carefully about the qualitative approach that you choose for your study. Then we outline phenomenography so that you can decide whether this would be useful approach for you to explore and use in the future. Phenomenography is not well known or utilized much in the Asia-Pacific region in nursing research, apart from in Australia. It has been used in the west, particularly in Scandinavia, but also in the USA, and UK and a few other countries to study different experiences of the people and their perceptions towards certain phenomena.

A few words on choosing the right research approach

Qualitative approaches help nursing researchers to gain insight into critical phenomena related to the people they care for and to different topics such as those related to the nursing profession, social and policy issues, and health systems. Today, there are many qualitative approaches available as well as different variations of these, with grounded theory (GT), ethnography, phenomenology, narrative inquiry, case studies, action research (AR), and participatory action research (PAR) being among the more well-known ones. As the years go by, the number of qualitative research approaches and methodologies has grown as scholars extend the boundaries of science and develop new ways of uncovering knowledge and the understandings and meanings of phenomena. In our rapidly transforming world, qualitative scholars attempt to get to the real "truth" of such phenomena, to the core of people's experience, and then describe in the best way possible those experiences lying at the heart of people's realities. Today, for many of us in nursing research and practice, the emphasis is about making sense of too much information being available in our worlds as a result of the exponential rise in technological developments. So it is vital, when deciding on the research approach, theoretical framework and the various methodologies to use in a study, that consideration is given to the congruence of these with the related socio-cultural context of the study setting(s) and the potential participants. This is to ensure that the social realities and experiences of individuals and groups can be efficiently and effectively explored in a meaningful way. Each researcher brings to their study their own particular world-views or presumptions that help to frame their potential or actual form of social inquiry.

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These need to be identified and examined in a reflective way before any project begins. The theoretical perspectives that each of us bring to a research study shapes the way in which we design a study or indeed interpret the findings, even if we have explicitly identified our assumptions about the phenomena or about the research processes or have attempted to be 'objective' about what we are trying to achieve.

There is, we believe, an imperative for nurse researchers to continue to challenge the status quo, to be not only be rigorous in research practices, and truthful in our interpretations of the human condition, but also to try out newer approaches and methods to try to understand and explain phenomena better. So as a researcher you need to ensure that you choose carefully the research approach and theories that are culture specific or are adapted to fit the setting under investigation (naturally where necessary seeking permission of the authors of such theories or research approaches). To explain further, there are some research approaches or theories or models that at first glance seem appropriate or relevant, but many are unrealistic in different cultural settings. They simply do not fit or may be rejected by gatekeepers of research. For example, in some cultures it might be altogether taboo to ask questions about sexual dysfunction; in others, people might be willing to fill in an anonymous questionnaire but reject totally the idea of undertaking an in-depth interview on the topic. Additionally, some practices of nursing research in the west may be conducted somewhat differently in eastern countries. But the challenge always is to ensure a balance between innovation, the reality of researcher's abilities, careful and relevant adaptation of research practices or theories to the local situation, and of course the likelihood of getting research approval for your study. Too often in our experiences, novice researchers try to implement various qualitative approaches without sufficient groundwork, mentorship or supervision, or prior practice, Planning and critical thinking, and getting the right advice is vital regarding your research approach, theoretical framework or various methodologies for your study. So, bearing this in mind, here is another research approach you might want to consider: phenomenography.

What is phenomenography?

This was developed by Ference Marton and his colleagues in Sweden at the University of Gothenborg in the mid-1970s, and originally emerged from an empirical basis, rather than a philosophical or theoretical one. According to Cutler et al.[1] phenomenography is ontologically subjective. There is an emphasis placed on the way a group of individuals construct their own reality to align with their unique experiences and understanding of the world. Marton was a professor and educational psychologist, who characterized phenomenography as a research technique for mapping social reality, in the subjectively unique and diverse ways by which groups of people encounter, conceptualize, see, and comprehend different parts of phenomena in their general surroundings.[2] Phenomenography has continued to evolve as it began to be used more widely; and today "there are two different approaches in the literature to analysing data: the Marton and Åkerlind methods".[3,p.30]

Undertaking qualitative research using a phenomenographical design helps you to understand 1) the experiences of people towards the reality 2) the distinctive manners by which they encounter similar phenomena[4] and 3) the variation in their experience through the 'derived conceptions'[5], which are interconnected[6] in different ways.

Phenomenography and its context

In phenomenography, researchers should be also the participants for parts of the world are interrelated; they should think about the connection between the participants and the phenomena by analyzing the 'concept' of the participants towards the phenomena[7]. Marton described people's experience as having two viewpoints: both a referential and structural perspective. The referential viewpoint examines 'what the phenomena are'[8]. The structural aspect considers 'how do the participants go with the phenomena?', and it is this latter aspect that phenomenographers need to concentrate on. Marton further divided the structural aspect into two horizons: external and internal horizons. The external horizon separates the phenomena from other phenomena in the world, whilst the internal horizon determines the elements of the phenomena and their relationship with each other as well as the whole entity[9]. For example, if as a researcher you want to study nurses' experiences about conflict in the workplace, you need to explore 'what is the conflict' (referential view) and 'how do the nurses go with a conflict?' (structural view). In the structural view, it is necessary for you to differentiate the conflict from the other elements in the workplace such as tension, stress, and anxiety (that is, the external horizon). Then, you need to further explore the interconnected parts of the conflict such as situations, roles, personal factors, environment, and interpersonal factors that influence that conflict and how do the nurses experience the interconnected elements of the conflict in the workplace. Finally, as researcher you need to gather all the concepts involved and study these again to categorize them, based on the variation of the nurses' experiences towards the conflict. Following this method helps you as researcher to understand the variation of people's experience towards the phenomena as a whole entity.

Semi-structured indepth interviews are an essential strategy for information gathering. Interviews need to be conducted in an open, friendly environment, most preferably in a natural setting and allowing participants time and space to reflect their own experiences and views. The desirable sample size for a phenomenographic study is small. Typically it is 15-20 participants, but the final sample may depend upon the achievement of data saturation[10]. Study participants can be selected through a snowballing method, convenience or purposive sampling to ensure maximum variation of their experiences. As in other qualitative approaches, researchers need to employ 'bracketing' of their assumptions and biases, so as not to contaminate the data with their own perceptions[11]. Data analysis commonly begins with the transcription of audio-recorded interviews into verbatim transcripts. Below we introduce to you the seven steps to undertake data analysis easily and effectively[4].

1. Familiarisation: Reading the transcripts many times until you get familiar with the data.
2. Compilation: Categorizing the participant statements based on the similarities and differences.
3. Condensation: Filtering the categories to extract relevant from the irrelevant ones.
4. Preliminary grouping: Grouping the similar categories again into limited numbers.
5. Preliminary comparison of categories: Identifying significant differences between the groups.
6. Naming the categories/groups: Naming categories based on the nature of the elements in each group.
7. Final outcome space: Arranging all the categories based on hierarchy or nature of occurrence to get the whole experience of the participants towards the given phenomena.

We add here an additional process for analysis from our research experience, that is to extract the relevant concepts carefully, for this is not included in the existing review literature about phenomenographic literature. We name the process as warming I-freezing-warming II-comparing-filtering (WFWCF) and whilst this might seem to be time-consuming, we believe it will lead to more rigorous and trustworthy findings.

Warming I- In this step, you have to do all the above-mentioned steps from familiarization to final outcome space and keep the results ready but "away from you".

Freezing- In the session, you need to try to clear your mind from the study by engaging in other activities for a period of one to two months. The purpose of the step is to approach the raw data again as a new one.

Warming II- After the freezing session, you have to transcribe the audio-recorded interviews verbatim and follow the steps from familiarization to final outcome space once again.

Comparing- In this session, you compare the concepts and final outcome space of warming II with warming I stage results.

Filtering- Again, you have to confirm the 'even' concepts which evolved similarly in both stages of warming. In addition, you have to filter the 'odd' concepts evolved uniquely in both outcome space based on the relevance. The purpose of the step is to finalize the limited number of concepts with variation.

The output of the phenomenography

This involves writing a detailed narrative of the findings to support the named categories and arrange the categories based on the nature of occurrence or hierarchy in a table, conceptual model, chart, called the outcome space. This gives a total variation of experience by the participants towards the given phenomena. For example, related to the above-given example, the categories would be derived from studying the nurse's experience towards the conflict in the workplace. Suppose, the categories are named as de-escalation, triggering, conflict, escalation, and post-conflict, arrangement of the categories can be based on the nature of the occurrence in a cyclical phase such as triggering, escalation, conflict, de-escalation, and post-conflict. Using the method regarding the outcome space, one can easily understand the variation of experiences of the participants towards the conflict in the workplace rather than the mere collection of categories.

Reliability and validity check of the results[12]

Here are two methods to check the reliability. 1) Intercoder reliability check: The two researchers can analyze the data independently and compare the categories. 2) Dialogic reliability check: The researcher can discuss and finalize the categories through discussions with other phenomenographic researchers. For validating the results[13], you can opt for two ways, 1) Communicative validity check: The researcher can communicate the results through conferences and seminars, and can conclude the interpretations based on the suggestions. 2) Pragmatic validity check: The researcher has to validate the results themselves by checking how the result of the exploration is advantageous to the intended interest group.

Phenomenography and phenomenology

Marton developed the phenomenography with an aim to understand a pupil's variation of experiences towards learning. Nonetheless, we attempted to understand the concepts, its scope in nursing research and difference with phenomenology. There seems to be numerous articles distributed on purportedly phenomenographic studies, where the outcomes introduced appear to be gained from a topical phenomenological examination[14]. This issue was also noted by Marton. To avoid such confusions, we briefly describe how the phenomenography differs from the phenomenology.

In phenomenography, the words 'phenomena' and 'graph', describe the variation of people's experience towards the phenomena. In phenomenology, the words 'phenomena' and 'logos' aim to understand meaning through the exploration of the lived experience towards it. It is the study of 'what the phenomena are' by exploring the participant lived experience of the phenomena through narrative description. This is called a first-order perspective. Phenomenography studies the participant's understanding of the phenomena by exploring '*how* it is' or 'what do you *feel* about it?' through the conception of experiences. This study does not focus on the phenomena but on the 'variation of experiences' in the participant's understanding of the phenomena. This is alluded to as a second-order point of view[13].

To illustrate this, we have selected an article, 'Anaesthesiologist's Work'[14], which explains the difference between the phenomenographic and phenomenological approach in the same study. The researchers developed the questions based on 'What is anaesthesiology?' in a study using the phenomenology approach, and 'What do you feel or think about anaesthesiology as an experienced person in the anaesthesia department?'

in the phenomenography approach. The thematic results in the phenomenological approach were 1) Carrying the responsibility regarding the patient's vital capacities 2) Continually being an alarm, observing painstakingly over the patient's body 3) Prepared to act on whatever point the patient's life is in peril and 4) Anesthetizing them safely. Here, the doctors explored the lived experience of anaesthesia focusing only on the patient's life through the first-order perspective. There were no variations on their lived experiences. In contrast, findings from the study using the phenomenographic approach produced four classifications 1) Seeing the patient as a physiological thing, checking and controlling the vital capacities: the expert craftsman 2) Seeing the patient as a man, managing him securely through the activity: the great Samaritan 3) Centering around the healing facility framework, serving patients, different specialists, and medical caretakers: the worker and 4) Sorting out and leading the working theater and group: the organizer with an outcome space (See study of Larsson et al.)[14]. The various ideas about anesthesiology from an 'accomplished anaesthesiologist's point of view', results in getting a far-reaching picture of the anesthesiology. This method of inquiry helped to find out the 'variations' in the 'understanding' of the anaesthesiologist's work from different angles, and so is deemed a second-order perspective approach.

Conclusion

We cannot say that the phenomenography is superior to phenomenology and vice versa as they are both different approaches with different expected outcomes. If you are serious about trying to understand and learn about the importance, process, use and rigor of phenomenographic and phenomenological designs, we recommend you to conduct a study using both designs; phenomenology in the first phase to understand the structure of the phenomena, and phenomenography in the second phase to understand the variation of participants' experiences towards the phenomena, sequentially. This can be called a sequential exploratory approach. These type of studies in the healthcare sector help to get the whole picture of the phenomena from the two sides, by analyzing the lived experience and variations in participant's experiences. Study findings would rich and would help, for example, administrators to revise care protocols to ensure quality and effective patient care. This is one way that two-design studies can pave the way to seal the gap between the research and clinical practice. We encourage you to be innovative in your qualitative research and to extend the boundaries of the qualitative approaches and methods you currently choose to use.

References

1. Cutler, N. A. Moxham, L., Stephens, M. Phenomenography: Alignment with personal recovery in mental health nursing. B J of Mental Health Nurs, 2017;6(5), 234-238.
2. Marton F. Phenomenography: a research approach to investigating different understandings of reality. J of Thought.1986;21(3):28 - 49.
3. Forster, M. Data-analysis issues in a phenomenographic investigation of information literacy in nursing Nurse Researcher. 2013, 21, 2, 30-34. doi: 10.7748/nr 2013. 11.21.2.30.e329
4. Sjöström B, Dahlgren LO. Applying phenomenography in nursing research. J Adv Nurs. 2002;40(3):339-45.
5. Bowden J. The nature of phenomenographic research. In J. Bowden & E. Walsh. Melbourne: RMIT University Press;2000,pp. 1-18.
6. Assarroudi A, Heydari A. Phenomenography: A mixed method in medical research. Acta Facultatis Medicae Naissensis [Internet]. 2016 Sep 1 [cited 2018 Aug 22]; 33(3):217-25. Available from: http://content.sciendo.com/view/journals/afmnai/33/3/article-p217.xml
7. Röing M, Holmström IK, Larsson J.A. Metasynthesis of phenomenographic articles on understandings of work among healthcare professionals. Qual Health Res [Internet]. 2018 Jan 1 [cited 2018 Sep 14];28(2):273-91. Available from: https://doi.org/10.1177/1049732317719433
8. Marton F, Booth S. Learning and awareness. New Jersey: Lawrence Erlbaum Associates;1997.

9. Diaz S, Walsh A. Promoting evidence-based practice and information literacy through an undergraduate nursing journal club. Pennsylvania Libraries: Research & Practice [Internet]. 2018 May 22 [cited 2018 Sep 14];6(1):23-38. Available from: http://www.palrap.org/ojs/index.php/palrap/article/view/171.
10. Richards DA, Hanssen TA, Borglin G. The Second Triennial Systematic Literature Review of European Nursing Research: Impact on patient outcomes and implications for evidence-based practice. Worldviews on Evidence-Based Nurs [Internet]. [cited 2018 Sep 14];0(0). Available from: https://sigmapubs.onlinelibrary.wiley.com/doi/abs/10.1111/wvn.12320
11. Persson U, Carlson E. Conceptions of professional work in contemporary health care—Perspectives from registered nurses in somatic care: A phenomenographic study. J of Clin Nurs [Internet]. [cited 2018 Sep 14];0(0). Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/jocn.14628
12. Åkerlind GS. Variation and commonality in phenomenographic research methods. Higher Ed Res & Develop.2005; 24(4):321-334.
13. Persson U, Carlson E. Conceptions of professional work in contemporary health care—Perspectives from registered nurses in somatic care: A phenomenographic study. J of Clin Nurs [Internet]. [cited 2018 Sep 14];0(0). Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/jocn.14628
14. Larsson J, Holmström I. Phenomenographic or phenomenological analysis: does it matter? Examples from a study on anaesthesiologists' work. Intern J of Qual Studies on Health and Well-being [Internet]. 2007 Jan [cited 2018 Sep 13];2(1):55-64. Available from: https://www.tandfonline.com/doi/full/10.1080/17482620601068105

A Causal Model of Self−Management for adolescents with Asthma

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Abstract: Self- management behavior is important for controlling symptoms and preventing death from asthma attack. Recent studies have shown that self-management of asthma among adolescents is mostly inadequate. For better design intervention to support self-management, understanding factors and how they influence self-management behaviors is necessary. Thus, this descriptive cross-sectional study developed and tested the Self-Management Model for Adolescents with Asthma. The participants were 442 Thai adolescents with asthma from 13 regional hospitals in Thailand. Data were collected by six self-administered questionnaires including; a demographic and Illness-Related Data Form, the Basic Need Satisfaction in Life Scale, Perception of Parents Scale, the Health Care Climate Questionnaire, the Aspiration Index, and the Thai Version of Asthma Self-Care Practice. Pearson's product moment correlation coefficient and structural equation modeling were used for analyzing the data.

The results showed that the final model fitted the empirical data, in which relatedness need satisfaction, intrinsic life goals, parental autonomy support, and extrinsic life goals variables explained 78% of total variance in self-management behavior. Relatedness need satisfaction and intrinsic life goals had positive direct effect on self-management behaviors. Parental autonomy support had a positive indirect effect, whereas extrinsic life goals had an negative indirect effect on self-management behaviors through relatedness need satisfaction. These findings suggest that nurses can use the model as a guideline for developing nursing interventions to promote relatedness need satisfaction and intrinsic life goals, promote extrinsic life goals for adolescents with asthma, and enhance autonomy support skills for parents.

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Introduction

Asthma is a chronic condition that affects adolescents worldwide. Evidences show that many adolescents with asthma have higher rates of uncontrolled asthma and suffer from asthma symptoms more than other age groups.[1-2] Inadequate self−management among adolescents with asthma leads to poorer lung function,

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sleep disturbance, loss of a variety of physical and daily activities, and reduced capability to participate in peer group activities.[3] Poor self-management also has negative impact on psychological functioning. Adolescents with asthma exhibit symptoms of depression and anxiety more than healthy adolescents.[4] In addition, uncontrolled asthma, is related to school absence and poor academic achievement.[5] However, these negative impacts are reducible when effective self-management behaviors are performed.[6]

Adolescents with asthma may not be able to control their disease because of many reasons, for example, conflict between adolescents and parents, as well as parents' command can be annoying and perceived as being controlled.[7] These situations may reduce their satisfaction with autonomy needs. In addition, when they use an asthma inhaler while taking part in social activities, they might feel that they are weak and look like a person with a neurotic personality.[8] These negative feelings might make them dissatisfied with their competence. Furthermore, adolescents with asthma are likely to experience peer rejection, as well as be bullied by friends, and these result in feeling disconnected to and unaccepted by others.[9] Therefore, dissatisfaction with autonomy, competence and relatedness need might lead to poor self-management behaviors among adolescents with asthma.[10]

Self-management behaviors of adolescents with asthma have been widely studied in many countries. A systematic review reveals that barriers and facilitators to asthma self-management in adolescent include knowledge, attitude, self-efficacy, social support, and intrinsic motivation factors that are related to adolescent development include autonomy, competence, and relatedness need.[11] Many interventions to promote self-management among adolescents with asthma were developed based on these influencing factors, but did not achieve good results.[12-13] To better design an intervention to promote self-management behaviors among adolescents with asthma, understanding of how these factors work to influence self-management is needed. Thus, this study investigated how intrinsic motivation factors of autonomy, competence, and relatedness need satisfaction, and the psychosocial factor of autonomy supported by significant others, life goals, and age work to influence self-management behaviors.

Conceptual Framework and Literature Review

The conceptual framework for this study was derived from Self-Determination Theory and a review of the literature. This theory proposes that healthy behavior in humans is led by three innate psychological needs: autonomy, competence, and relatedness.[10] In this study, healthy behavior was conceptualized as self-management behaviors. Self-management is defined as learning and practicing the skills necessary to carry out an active and emotionally satisfying life in the face of chronic conditions.[14] In addition, for adolescents with asthma, the important skills when asthma symptoms emerge consist of prevention, managing an attack, and social skills.[15]

According to the Self-Determination Theory of Richard M. Ryan and Edward L. Deci, self-management behaviors among adolescents with asthma are influenced by both intrinsic motivation factors and psychosocial factors. Intrinsic motivation comprises three basic need satisfactions: autonomy need satisfaction, competence need satisfaction, and relatedness need satisfaction. Psychosocial factors involved in autonomy support by significant others include parental autonomy support and autonomy support by health care providers. Life goals were characterized as intrinsic life goals of health and extrinsic life goals of image.[10]

For intrinsic motivation, first, autonomy need satisfaction is an individual's perception of autonomy achievement. Autonomy refers to acting with a sense of volition and having the experience of choice.[10] When adolescents engage in asthma self-management activities because they find them beneficial and interesting, they are doing the activity wholly voluntarily. Perceived autonomy is indicated as a facilitator to asthma self-management.[11] Second, competence need satisfaction refers to adolescents' perceived ability to manage and control over asthma.[10] It is indicated as a significant predictor of asthma medication adherence [16] and asthma self-management.[11] Third, relatedness need satisfaction is a desire to feel connected to and accepted by others in a social context.[10] It has been found that perceived relatedness from family routine in adolescents with asthma positively affects medication adherence.[17] However, the studies involved in intrinsic motivation factors are limited. Instead of self-management behaviors, previous studies focused on asthma medication adherence.[17-18]

In psychosocial factors, first, parental autonomy support perceived by adolescents is the extent to which parents appraise and provide their children with an opportunity for independent problem solving, choice, and self-determination. Parental autonomy support produced autonomy, competence and relatedness need satisfaction in adolescents.[19] Studies of parental autonomy support in adolescents with asthma are limited, however, existing data about adolescents with diabetes were clear for parental autonomy support relationship with self-management behaviors.[20] Perceived parental autonomy support has an indirect effect on dietary self-care through perceived autonomous motivation among adolescents with Type I diabetes.[20] Second, autonomy support by health care providers is the extent to which health care providers elicit and acknowledge adolescents' perspectives, support adolescents' initiatives, offer choices about treatment options, and provide relevant information while minimizing pressure and control.[21] A study demonstrated that adolescents with diabetes who perceived autonomy support by health care providers had higher intrinsic motivation.[20] Autonomy support by health care providers had both direct and indirect effects on dietary self-care through perceived autonomous motivation among adolescents with type I diabetes.[20]

Intrinsic life goals are the inherent desire to develop one's interests, values, and potentials such as self-acceptance, affiliation, and physical health and positively related to the attainment of well-being.[22] Since asthma is a chronic condition that impacts adolescents' health, we selected physical health as the representative of intrinsic life goals. Little attention has been paid to the extent to which how it affects self-management behaviors among adolescents with asthma. Among adolescent females, intrinsic life goals negatively and indirectly effect unhealthy weight control behaviors through intrinsic motivation.[23] Extrinsic life goals are primarily characterized by having an "outward" orientation, with individuals' pursuit being directed toward external indicators of worth such as fame, and appealing image.[23] Individuals who have extrinsic life goals are likely to experience low autonomy, competence, and ill-being.[24] During adolescence, image is a critical development, thus it was selected as the representative of extrinsic life goals.[25] Image is a sensitive issue for adolescents with asthma. Evidence showed that greater concerned in image produced lower asthma medication adherence among adolescents.[8] Furthermore, extrinsic life goals of image had a positive indirect affected on unhealthy weight control behavior through intrinsic motivation.[23]

In this study, age was also included in the causal relationship model of self-management behaviors. Adolescents with asthma can manage their condition better when their cognitive ability and responsibility develop and mature.[18] This study focused on early (10-13 years old) and middle (14-16 years old) adolescence [26] because these groups suffer more from asthma symptoms than other age groups.[1-2] In addition, they must take more responsibility and adopt more complicated skills for controlling asthma symptoms by themselves than school-age children.[16] Furthermore, during transition to teen years, they are confronted with rapid changes in physical and psychosocial aspects, and need more support than other age groups.[27] Age has positive relationship with responsibility of self-management among adolescents with asthma.[28] The relationship between age and self-management behaviors could be mediated by psychosocial factors, including autonomy, competence, and relationship.[28] Study found that older adolescents reported greater perception of independence and ability to manage their asthma.[29] In addition, a previous study in adolescents aged 10-17 years revealed that, compared with younger participants, older participants felt greater trust and later disclosed their asthma symptoms to parents, reflecting better relationship with their parents.[29]

From existing knowledge and previous studies, the Self-Management Model for Adolescent with Asthma (SMMAA) was developed. The causal relationships among age, parental and health care providers' autonomy support, intrinsic and extrinsic life goals, autonomy, competence, relatedness need satisfaction, and self-management behavior were tested against the empirical evidence (Figure 1). It was hypothesized that this model fitted with the data.

Methods

Design: A cross-sectional design was used.

Sample: Eligibility criteria were: being between 10 and 16 years of age; having been diagnosed with asthma for at least six months; and taking at least one type of asthma medication. Those excluded from the study were individuals having asthma symptoms such as breathlessness, a tight chest, coughing, as well as wheezing that could affect their ability to respond to self-report questionnaires. The sample size was determined based on a structural equation model of testing. A larger sample size of 10-20 participants per one parameter was recommended to obtain a more trustworthy Z-test on the significance of the parameter and better model fit evaluation.[30] The researchers estimated a sample size of 390-780 based on 39 parameters of variable.

The multi-stage sampling method was used to select the participants in this study. In the first stage, the representatives from 26 regional hospitals in four regions of Thailand were randomly selected. Since the number of adolescents with asthma from each hospital varied from 30 to 250, this study needed 13 hospitals to get at least 390 samples. Hence, a number of hospitals from each region of Thailand were proportionately and randomly selected as: 3 from 6 hospitals in the north, 3 from 6 hospitals in the northeast, 5 from 9 hospitals in the center, and 2 from 5 hospitals in the south. For the second stage, convenience sampling was employed. All 486 adolescents with asthma who visited a hospital on the date of data collection and met the inclusion criteria were approached and invited to participate. Eighteen eligible participants refused to participate because they had limited time. While participating in this study, 26 eligible participants did not want to answer some questions. Therefore, the total number of participants was 442.

Ethical Considerations: This study was approved by the Research Ethics Review Committee of the Faculty of Nursing, Chiang Mai University (IRB Approval No. 173/2015) and the research ethics committee of each of the thirteen hospitals used as study sites. All eligible participants were informed about the objective, methods, time required to complete the questions, code number assigned to ensure anonymity and confidentiality. Participants were free to decide about study participation by themselves and free to refuse or withdraw from the study at any time without effect on their care and treatment. Assents were obtained from all participants and consents were given by their parents.

Instruments: Data were collected using six instruments. All instruments, except the demographic data and the Thai Version of Modified Asthma Self-Care Practice Instrument (AsSCPI), were originally in English. Thus, they were translated with permission from English into Thai by the researchers and back into English using the back-translation technique.[31] All instruments, except the demographic and illness-related data form, were pilot-tested for reliability using Cronbach's alpha coefficient with 10 adolescents with asthma. The reliability of pilot study and this study are presented in **Table 1**.

A *demographic and illness data sheet* was developed

Table 1 The Cronbach's alpha coefficient of reliability of instruments

Instruments	**Internal Consistency Reliability**	
	Pilot test	**Actual study**
Basic Needs Satisfaction in Life Scale		
Autonomy need satisfaction	0.78	0.84
Competence need satisfaction	0.71	0.81
Relatedness need satisfaction	0.84	0.84
Perception of Parent Scale (POPS)	0.84	0.89
Health Care Climate Questionnaire (HCCQ)	0.88	0.84
Aspiration Index		
Intrinsic life goals	0.71	0.89
Extrinsic life goals	0.91	0.85
Thai Version of Modified Asthma Self-Care Practice Instrument (AsSCPI).	0.92	0.95

by the researchers to obtain medical and asthmatic disease history and gender, age, education, occupation, living status, asthma control, age at asthma diagnosis, and asthma medications used.

The Basic Needs Satisfaction in Life Scale was used to measure adolescent's autonomy need satisfaction (seven items), competence need satisfaction (six items), and relatedness need satisfaction (eight items).[32] Example items are "I feel like I am free to decide for myself how to live my life" for the subscale of autonomy need satisfaction, "People I know tell me I am good at what I do" for competence need satisfaction, and "People in my life care about me" for relatedness need satisfaction. Responses for each item are based on 7-point Likert-scale ranging from 1 (not true at all) to 7 (definitely true). A higher mean score indicates greater satisfaction with autonomy, competence, and relatedness.

The Perception of Parent Scale (POPS), developed by Grolnick, Ryan, and Deci,[19] was used to assess children's perceptions of parental autonomy support. The questionnaire consists of [12] items that address six about the mother and other six about the father. Participants were instructed to circle the letter of one of four descriptions of parents that were most like their own. Example items are: "Some mothers never punish their children; they always talk to their children about what was wrong". The four response choices for six items of the scale are ordered from low to high and are scored from 1 to 4, whereas the response choices for the other six items are ordered from high to low and are scored from 4 to 1. A higher score indicated a greater degree of perceived parental autonomy support.

The Health Care Climate Questionnaire (HCCQ): The short form of this questionnaire consisted of six items and was used to measure the adolescents' perception of autonomy support by their health care providers.[33] An example item is "I feel that my health care provider team has provided me choices and options". The responses are based on a 7-point Likert-scale, ranging from 1 (strongly disagree) to 7 (strongly agree). A higher score indicates a greater degree of perceived autonomy support by health care providers.

The Aspiration Index was used to measure intrinsic and extrinsic life goals.[22] Originally, this index consisted of three domains of importance, likelihood to attain, and achievement. Each domain includes four intrinsic (meaningful relationships, personal growth, community contributions, and physical health) and three extrinsic life goals (wealth, fame, and image). To decrease the burden on participants,[23] only important domains were used. Adolescents were asked to rate how important each of the five items of physical health was to them (e.g., "To keep myself healthy and well") and five items of image were to them (e.g., "To have people comment often about how attractive I look"). Each item is rated on a 7-point Likert-scale ranging from 1 (not at all) to 7 (very much). A higher mean score indicates a greater degree of importance of health or image is to them.\

The Thai Version of Modified Asthma Self-Care Practice Instrument (AsSCPI) was used to assess self-management behaviors with permission.[15] The instrument consists of 22 items rated on a rating scale, which ranges from 0 to 10 representing how often the respondents perform the behaviors (items such as "How much do you give yourself your own asthma medicine?" and "How much do you take extra care of yourself in cold or rainy weather?"). The content validity index (CVI) for this instrument was analyzed. A revision of 10 of 22 items of this scale was undertaken based on the recommendation of the expert panel. One of the 22 items was excluded based on the recommendation that it was not relevant to asthma management.[3] Therefore, there were 21 items used in this study. To make it easy for the participants 10-16 years of age, the response items were changed from the rating scale of 0-10 to the rating scale of 0-4 based on the expert's recommendation. A higher score indicated that behaviors in regard to asthma self-management were performed more consistently. The item-level CVI (I-CVI) ranged from .33 to 1.00, and the average I-CVI was .92. The S-CVI value was found to be .92. In this study, content validity was approved by a panel of three experts (two nurse instructors who had expertise in the concept of self-management and care of children, and one pediatrician with expertise in asthma management).

Data Collection Procedures: Data collection was conducted between October 1, 2016 to March 31, 2017 at pediatric asthma clinics of outpatient departments of 13 regional hospitals by the 18 research assistants (one research assistant for each of the eight hospitals and two research assistants for each of the remaining five hospitals). All research assistants were registered nurses and had experience in conducting research. They were trained formally for sample selection and questionnaire collection before collecting data. Prior to data collection, potential participants and parents were approached by the primary investigator or the research assistants. The study purpose, procedure, and information regarding confidentiality were explained to the participants. Unaided by their parents, the participants read and answered all of the questionnaires, which took approximately 45-60 minutes to complete.

Data Analysis: Descriptive statistics, including actual numbers, percentages, means, and standard deviations, were used to analyze participants' characteristics. Relationships between the variables were analyzed using Pearson's correlation coefficients. Structural equation modeling was used to identify the direct and indirect effects of the affecting factors and to test a hypothetical model of self-management behaviors among adolescents with asthma. SPSS 16.0 and LISREL 8.52 software were used for data analysis.

Results

Characteristics of participants: The total sample was 442 (260 males, 58.82%) with a mean age of 11.98 years (SD = 1.79). More than half of participants had been diagnosed with asthma before six years old (54.97%). Most of them were in a status of controlled asthma (66.52%), had been prescribed one or two asthma medications (74.66%), were grades 4-6 students (98.86%) and living with their parents (80.09%).

Correlational analyses: The correlation of the eight independent variables and the dependent variable were illustrated in **Table 2**. Relationships between all independent variables, except age and autonomy support by health care providers, and self-management behaviors were found ($p < 0.01$).

Model testing: The initial model (**Figure 1**)

Table 2 Correlation matrix of the study variables (n = 442)

Variables	SMB	ANS	CNS	RNS	AGE	PAS	HAS	ILG	ELG
- Self-management behavior (SMB)	1.00								
- Autonomy need satisfaction (ANS)	.35**	1.00							
- Competence need satisfaction (CNS)	.28**	.79**	1.00						
- Relatedness need satisfaction (RNS)	.72**	.34**	.29**	1.00					
- Age (AGE)	.04	.10*	.08	.01	1.00				
- Parental autonomy support (PAS)	.46**	.75**	.69**	.49**	.05	1.00			
- Autonomy support by healthcare provider (HAS)	.08	.21**	.16**	.06	.03	.12*	1.00		
- Intrinsic life goals of health (ILG)	.29**	.42**	.40**	.23**	.04	.40**	.33**	1.00	
- VExtrinsic life goals of image (ELG)	-.45**	-.12*	-.01	-.52**	.07	-.17**	.08	.02	1.00

Note. * p < .05; ** p < .01

was a poor fit to the data (χ^2 = 14.93, p = .01, df = 5, GFI = .98, AGFI = .81, CFI = .98, PGFI = .11, NNFI = .82, and RMSEA = .06). Therefore, the hypothesized model was adjusted based on acceptable modification indices and theoretical reasoning. The pathway from intrinsic life goals to SMB and the pathway from parental autonomy support to intrinsic life goals were added into the model based on previous studies.[32-33] For clarity and ease, some variables were omitted and the non-significant pathways in the hypothesized model were deleted. However, the non-significant pathways of autonomy need satisfaction, competence need satisfaction and self-management behaviors had remained in the model because both variables are important components of intrinsic motivation.[10] Consequently, the final model revealed a good fit to the data (χ^2 = 9.62, p = .65, df = 12, GFI = .98, AGFI = .95, CFI = 1, PGFI = .11, NNFI = 1.02, and RMSEA = .00).

The causal effects of the variables on self-management behaviors among adolescents with asthma are displayed in **Table 3** in terms of direct, indirect and total effects. Four paths proposed in the final model for predicting self-management behaviors among adolescents with asthma were significant **(Figure 2 and Table 3).** Self-management behaviors was significantly influenced by intrinsic motivation factor: relatedness need satisfaction (β = .85), and psychosocial factors: parental autonomy support (β = .44), extrinsic life goals (β = - .36), and intrinsic life goals (β = .08). The determinant with the largest total causal effect was relatedness need satisfaction. Altogether, these four factors explained 78% of the variance in self-management behaviors.

The influencing factors on self-management behaviors among adolescents with asthma were identified **(Figure 2).** Intrinsic motivation factor of relatedness need satisfaction had a positive direct effect on the self-management behaviors. However, other intrinsic motivations including autonomy and competence need satisfaction did not affect self-management behaviors. Intrinsic life goals had a slightly positive direct effect on self-management behaviors. Parental autonomy support had a positive indirect effect and extrinsic life goals had a negative indirect effect on self-management behaviors via relatedness need satisfaction.

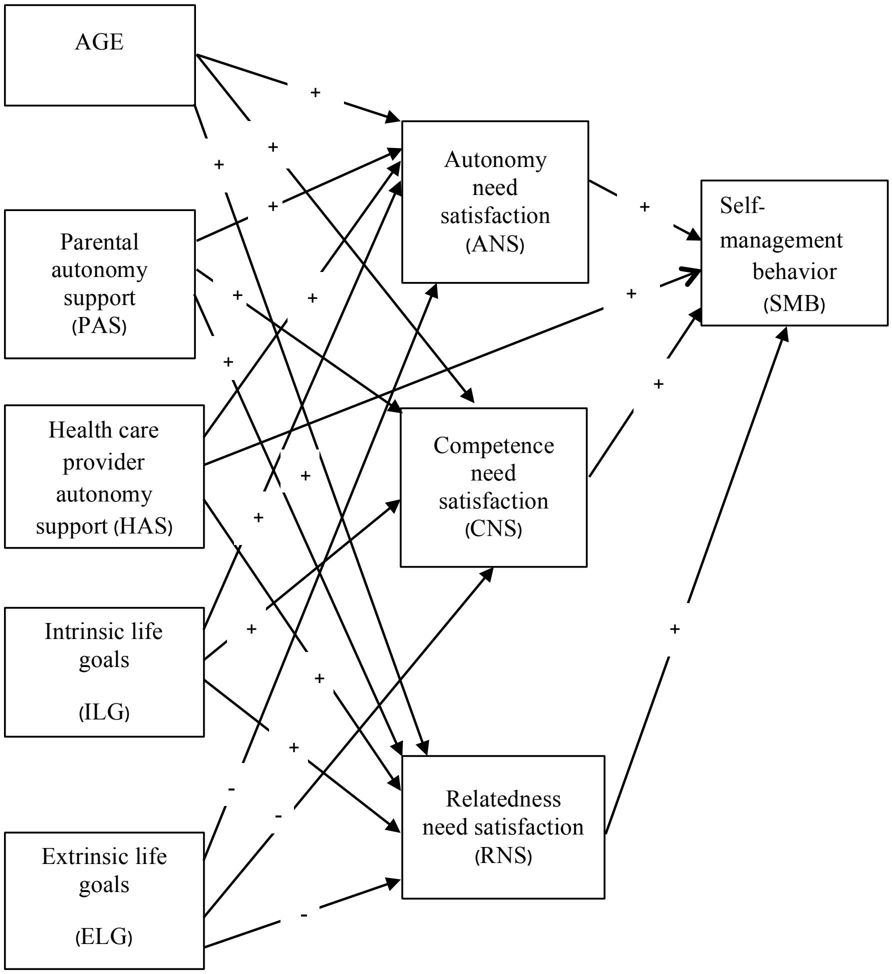
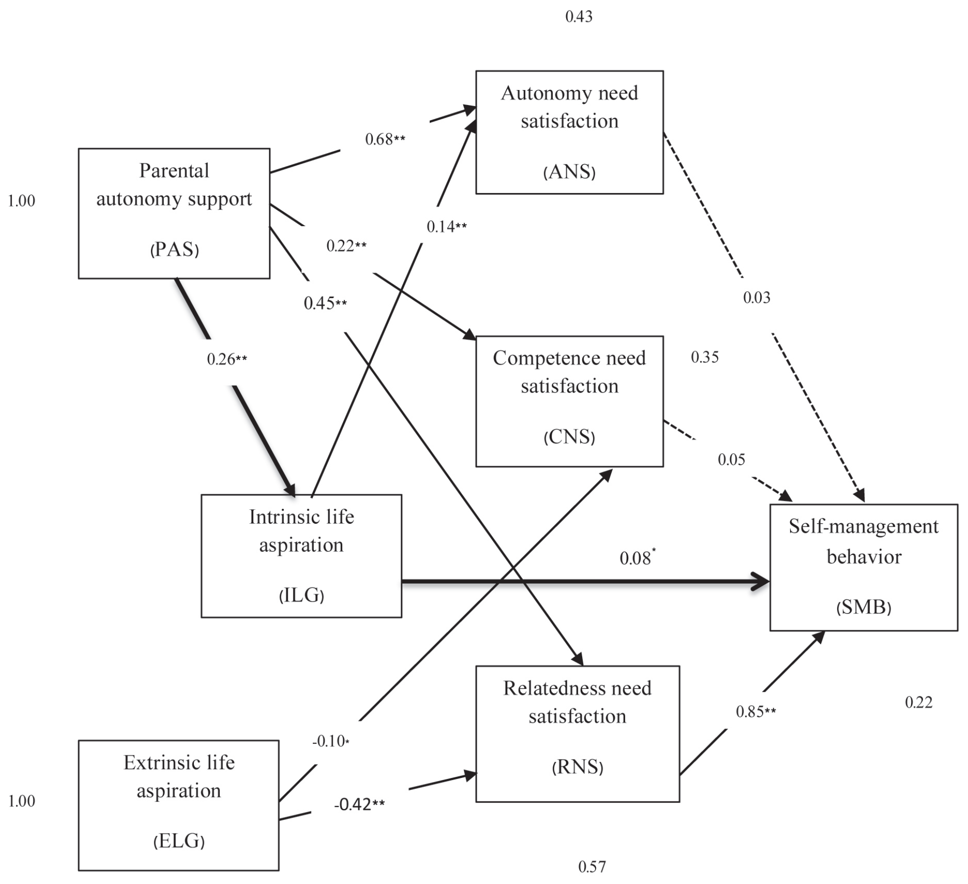


Figure 1 The hypothesized model of self-management behavior for adolescent with asthma

Table3 Direct effect, indirect effect, and total effect in the model (n = 442)

Independent variables	Self-management		
	Direct effect	**Indirect effect**	**Total effect**
Autonomy need satisfaction	0.03	-	0.03
Competence need satisfaction	0.05	-	0.05
Relatedness need satisfaction	0.85**	-	0.85**
Age	-	0.00	0.00
Parental autonomy support	-	0.44**	0.44**
Intrinsic life aspiration	0.08*	0.00	0.08*
Extrinsic life aspiration	-	-0.36**	-0.36**
R^2 for structural equation 0.78**			

Note. * p < .05; ** p < .01



Chi-Square = 9.62, p = .65, df = 12, RMSEA = 0.00, $R^2_{SMB} = 0.78$, $R^2_{ANS} = 0.56$, $R^2_{CNS} = 0.64$, $R^2_{RNS} = 0.43$, $R^2_{ILG} = 0.15$

Note. ⟶ indicates significant
⇢ indicates non-significant
\- indicates negative relationship
⟹ indicates added pathway

Figure 2 The modified model of self-management behavior for adolescents with asthma

Discussion

Overall, the final SMMAA could explain 78% of the total variance in self-management. Four out of eight factors (relatedness need satisfaction, parental autonomy support, extrinsic life goals, and intrinsic life goals) could explain self-management among adolescents with asthma.

Relatedness need satisfaction had the strongest positive direct effect on self-management behaviors. This finding was in accordance with the Self-Determination Theory in that children and adolescents who have more relatedness need satisfaction are more likely to perform active tasks.[10] This finding from this study was also consistent with previous research in which student who had a high level of relatedness need satisfaction were more likely to perform positive action such as prosocial behavior in school.[34]

Parental autonomy support had positive indirect effect on self-management behaviors through relatedness need satisfaction. This result indicated that parents who gave autonomy supportive nurture enhanced the relatedness need satisfaction of their children. This finding supported the Self-Determination Theory in that parental autonomy support can facilitate relatedness need satisfaction among adolescents and lead them to initiate healthy behavior.[10] The finding was also similar to a prior study that showed parental autonomy support to be a protective factor against health risk behaviors.[35]

Extrinsic life goals had negative indirect effects on self-management behavior through relatedness need satisfaction. Extrinsic life goals are primarily characterized by having an "outward" orientation, with the individuals' pursuit being directed toward external indicators of worth such as fame, and appealing image.[22] This reflected that when adolescents were more concerned about their image, they were more likely to develop negative relationships with others, leading to poor self-management behaviors. This finding also supported by the Self-Determination Theory [10] suggesting that people's pursuit of extrinsic life goals, such as wealth, fame, and image, which are beyond their basic need satisfaction, might direct their energy toward these extrinsic ends and away from the activities that provide more in-depth and direct need satisfaction. Furthermore, people who hold higher extrinsic life goals relative to intrinsic life goals are more likely to have psychological problems such as narcissism, negative affect, depression, and anxiety. [10]

Interestingly, intrinsic life goals had a slightly positive direct effect on self-management behaviors. This result was different from the hypothesized model which indicated that intrinsic life goals indirectly influenced self-management behavior via intrinsic motivation.[10] This means that adolescents who were more concerned about their health were more likely to perform asthma self-management behaviors. One explanation might be that more than half of the participants had been living with asthma for more than four years. Suffering from asthma symptoms might directly cause them to focus on controlling asthma and seek for maintaining healthy life. The finding in this study was similar to a previous study in which persons who maintained intrinsic life goal could promote their own healthy behavior. [36]

Autonomy and competence need satisfaction did not show the effects on self-management behaviors in the final model. One explanation might be that, during adolescence, the youngsters need acceptance and connectedness with parents and peer group to strengthen their healthy behaviors. [27] Thus, a need for autonomy and competence is obscure. The finding from this study was similar to previous research in which autonomy need satisfaction and competence need satisfaction could not predict positive behavior such as prosocial behavior. [34]

Age presented a non-significant correlation with self-management behaviors and then could not affect self-management behaviors. A possible explanation of this finding could be that most of the participants were under 12 years old and data showed non-normal distribution. Due to this homogeneity of the participants, there was a lack of variation among adolescents with asthma. Thus, for these reasons, the statistical conclusion validity of this research is questionable.

Autonomy support by health care providers did not show a significant role in the model of self-management behaviors. This unexpected result was inconsistent with the study in adolescents with type I diabetes.[20] One explanation might be that the most substantial proportion of the participants (66.51%) had good control of their asthma; thus, the interaction between health care providers might not underline the autonomy support for their young patients. Most participants lived with their parents (80.09%), so they might perceive more autonomy support from parents than from health care provider teams.

Limitations

This study had limitations in terms of generalizability because most participants were young adolescents (age 10-12 years), therefore, generalization to older age groups should be made with caution. The interpretation of causal relationships in the final model in this study must be used with caution for the reason of cross-sectional design. Therefore, a longitudinal study is needed.

Conclusions and Implications for Nursing Practice and Future Research

The final model of SMMAA found the casual variables of relatedness need satisfaction and intrinsic life goals had a direct effect on self-management behaviors while parental autonomy support and extrinsic life goals of image had an indirect effect through relatedness need satisfaction. The implication for nursing practice is to develop interventions involving promoting relatedness need satisfaction and intrinsic life goals, decreasing extrinsic life goals for adolescents, and enhancing autonomy support skill for parents. The findings of this study have significant implications for nursing research in conducting experimental research to develop and examine the effect of interventions.

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References

1. Mallol J, Aguirre V, Mallol-Simmonds M, Matamala-Bezmalinovic A, Calderón-Rodriguez L, Osses-Vergara F. Changes in the prevalence of asthma and related risk factors in adolescents: three surveys between 1994 and 2015. Allergologia et Immunopathologia. 2018 Nov 30. [Science Direct ahead of print]
2. Chinratanapisit S, Suratannon N, Pacharn P, Sritipsukho P, Vichyanond P. Prevalence and severity of asthma, rhinoconjunctivitis and eczema in children from the Bangkok area: The Global Asthma Network (GAN) Phase I. Asian Pacific Journal of Allergy and Immunology. 2018.
3. Chipps BE, Haselkorn T, Rosén K, Mink DR, Trzaskoma BL, Luskin AT. Asthma exacerbations and triggers in children in TENOR: Impact on quality of life. Journal of Allergy and Clinical Immunology: In Practice. 2018 6(1): 169-176.
4. Junghans-Rutelonis AN, Tackett AP, Suorsa KI, Chaney JM, Mullins LL. Asthma-specific cognitions, self-focused attention, and fear of negative evaluation in adolescents and young adults diagnosed with childhood-onset asthma. Psychology, Health & Medicine. 2018 23(1): 69-81.
5. Sullivan P, Ghushchyan VG, Navaratnam P, Friedman HS, Kavati A, Ortiz B, Lanier B. School absence and productivity outcomes associated with childhood asthma in the USA. Journal of Asthma. 2018 55(2): 161-168.
6. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention. Global Initiative for Asthma: GINA. 2018. [cited 2019 February 21]. Available from http://www. ginasthma.org/. GINA 2018.
7. Branje S. Development of parent–adolescent relationships: Conflict interactions as a mechanism of change. Child Development Perspectives. 2018 12(3): 171-176.
8. De Simoni A, Horne R, Fleming L, Bush A, Griffiths C. What do adolescents with asthma really think about adherence to inhalers? Insights from a qualitative analysis of a UK online forum. BMJ Open. 2017 7(6):e015245.
9. Nabors L, Odar-Stough C, Peugh J, Merianos AL, Cunningham J, Yockey RA. Adolescent flourishing in relation to having asthma: Results from a population-based cross-sectional study. Journal of Asthma. 2018. 55(2): 132-136.
10. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American Psychologist. 2000 55(1):68-78.
11. Holley S, Morris R, Knibb R, Latter S, Liossi C, Mitchell F, Roberts G. Barriers and facilitators to asthma self-management in adolescents: A systematic review of qualitative and quantitative studies. Pediatric Pulmonology. 2017 52(4): 430-442.

12. Gao Q, Huang H, Zhu K, Liu X, Hou X, Guan H, et al. Clinical course and factors associated with asthma control in children under control-based asthma management: a prospective study. Iranian Journal of Allergy, Asthma and Immunology. 2018 17(1): 18-28.
13. Kneale D, Harris K, McDonald VM, Thomas J, Grigg J. Effectiveness of school-based self-management interventions for asthma among children and adolescents: findings from a Cochrane systematic review and meta-analysis. Thorax, thoraxjnl-2018 [Internet]. 2019 [cited 2019 Feb 21]. Available from: https://thorax.bmj.com
14. Lorig KR, Holman HR. Self-management education: history, definition, outcomes, and mechanisms. Annual of Behavioral Medicine. 2003 26(1): 1-7.
15. Preechawong S. Self-esteem, learned resourcefulness, and self-management behavior of Thai adolescents with asthma (PhD dissertation). Cleveland, Ohio: Case Western Reserve University; 2004.
16. Rhee H, Wicks MN, Dolgoff JS, Love TM, Harrington D. Cognitive factors predict medication adherence and asthma control in urban adolescents with asthma. Patient Preference and Adherence. 2018 12: 929-937.
17. Bruzzese JM, Idalski CA, Lam P, Ellis DA, Naar-King S. Adherence to asthma medication regimens in urban African American adolescents: application of self-determination theory. Health Psychology. 2014 33(5): 461-464.
18. Ahmad A, Sorensen K. Enabling and hindering factors influencing adherence to asthma treatment among adolescents: A systematic literature review. Journal of Asthma. 2016 53(8): 862-878.
19. Grolnick WS, Ryan RM, Deci EL. Inner resources for school achievement: motivational mediators of children's perceptions of their parents. Journal of Educational Psychology.1991 83(4): 508-517.
20. Austin S, Senécal C, Guay F, Nouwen A. Effects of gender, age, and diabetes duration on dietary self-care in adolescents with type 1 diabetes: a self-determination theory perspective. Journal of Health Psychology. 2011 16(6), 917-928.
21. Ryan RM, Patrick H, Deci EL, Williams GC. Facilitating health behaviour change and its maintenance: Interventions based on self-determination theory. The European Health Psychologist. 2008 10(1): 2-5.
22. Kasser T, Ryan RM. Further examining the American dream: differential correlates of intrinsic and extrinsic goals. Personality and Social Psychology Bulletin. 1996 22:280 -287.
23. Thogersen-Ntoumani C, Ntoumanis N, Nikitaras N. Unhealthy weight control behaviours in adolescent girls: A process model based on self-determination theory. Psychology and Health. 2010 25(5): 535-550.
24. Vansteenkiste M, Lens W, Deci EL. Intrinsic versus extrinsic goal contents in self-determination theory: Another look at the quality of academic motivation. Educational Psychologist. 2006 41(1): 19-31.
25. Hatano K, Sugimura K, Schwartz SJ. Longitudinal links between identity consolidation and psychosocial problems in adolescence: using bi-factor latent change and cross-lagged effect models. Journal of Youth and Adolescence. 2018 47(4): 717-730.
26. World Health Organization-WHO. Maternal, Newborn, Child and Adolescent Health: Adolescent Development. 2017. [cited 2019 February 20]. Available from https://www.who.int/maternal_child_adolescent/en/
27. Özdemir A, Utkualp N. Physical and psychosocial effects of the changes in adolescence period. International Journal 2016 9 (2):717-723.).
28. Saxby N, Beggs S, Battersby M, Lawn S. What are the components of effective chronic condition self-management education interventions for children with asthma, cystic fibrosis, and diabetes? a systematic review. Patient Education and Counseling 2018 Nov 13. [Science Direct ahead of print]
29. Imam L, Zilioli S, Tobin ET, Saleh DJ, Kane HS, Slatcher RB. Youth secrets are associated with poorer sleep and asthma symptoms via negative affect. Journal of Psychosomatic Research. 2017 96: 15-20.
30. Garson GD. Structural equation modeling. North Carolina State University. College of Humanities and Social Sciences. 2006 [cited 2014 August 25]. Available from http://www2.chass.ncsu.edu/garson/pa765/structur.htm
31. Cha ES, Kim KH, Erlen JA. Translation of scales in cross-cultural research: issues and techniques. Journal of Advanced Nursing. 2007 58(4): 386-395.
32. Gagné M. The role of autonomy support and autonomy orientation in prosocial behavior engagement. Motivation and Emotion. 2003 27(3):199-223.

33. Williams GC, McGregor HA, Zeldman A, Freedman ZR, Deci, EL. Testing a self-determination theory process model for promoting glycemic control through diabetes self-management. Health Psychology. 2004 23(1):58-66.
34. Tian L, Zhang X, Huebner ES. The effects of satisfaction of basic psychological needs at school on children's prosocial behavior and antisocial behavior: the mediating role of school satisfaction. Front Psychol. 2018 9:548.
35. Riley BH, McDermott RC. Applying self-determination theory to adolescent sexual-risk behavior and knowledge: a structural equation model. Journal of the American Psychiatric Nurses Association. 2018 24(6): 482-494.
36. Bradshaw EL, Sahdra BK, Calvo RA, Mrvaljevich A, Ryan RM. Users' intrinsic goals linked to alcohol dependence risk level and engagement with a health promotion website (Hello Sunday Morning): observational study. JMIR Ment Health. 2018 5(4): e10022.

แบบจำลองเชิงสาเหตุของพฤติกรรมการจัดการตนเองสำหรับวัยรุ่นโรคหืด

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บทคัดย่อ:พฤติกรรมการจัดการตนเองของวัยรุ่นโรคหืดเป็นสิ่งสำคัญต่อการควบคุมอาการและการป้องกันการเสียชีวิตจากการกำเริบของโรคหืด แต่การจัดการตนเองในวัยรุ่นโรคหืดส่วนใหญ่ยังไม่ดี เพื่อให้มีการออกแบบโปรแกรมสนับสนุนการจัดการตนเองที่ดีขึ้น การเข้าใจถึงปัจจัยและอิทธิพลของปัจจัยเหล่านั้นต่อพฤติกรรมการจัดการตนเองจึงเป็นสิ่งจำเป็น การศึกษาเชิงพรรณนาแบบภาคตัดขวางนี้มีวัตถุประสงค์เพื่อพัฒนาและทดสอบรูปแบบการจัดการตนเองสำหรับวัยรุ่นโรคหืด กลุ่มตัวอย่างเป็นวัยรุ่นไทยโรคหืดจำนวน 442 คนจากโรงพยาบาลศูนย์ 13 แห่งของประเทศไทย รวบรวมข้อมูลโดยใช้แบบสอบถาม 6 ฉบับ ประกอบด้วย แบบสอบถามข้อมูลส่วนบุคคลและข้อมูลที่เกี่ยวข้องกับความเจ็บป่วย แบบวัดความต้องการพื้นฐานความพึงพอใจในชีวิตด้านความเป็นอิสระ ความสามารถ และสัมพันธภาพ แบบวัดการสนับสนุนความเป็นอิสระโดยพ่อแม่ แบบสอบถามบรรยากาศการดูแลสุขภาพ แบบวัดความสำคัญของดัชนีเป้าหมาย และเครื่องมือวัดการปฏิบัติการดูแลโรคหืดด้วยตนเองฉบับปรับปรุงภาษาไทย วิเคราะห์ข้อมูลโดยใช้สถิติสหสัมพันธ์เพียร์สัน และสถิติการวิเคราะห์โมเดลสมการโครงสร้าง

ผลการศึกษาพบว่า แบบจำลองรูปแบบสุดท้ายมีความสอดคล้องกับข้อมูลเป็นอย่างดี ตัวแปรความความพึงพอใจในชีวิตด้านความสัมพันธ์ เป้าหมายชีวิตภายในตน การสนับสนุนความเป็นอิสระโดยพ่อแม่ และเป้าหมายชีวิตภายนอกตน สามารถร่วมกันอธิบายพฤติกรรมการจัดการตนเองของวัยรุ่นโรคหืดได้ร้อยละ 78 ความพึงพอใจในชีวิตด้านความสัมพันธ์ เป้าหมายชีวิตภายในตน มีอิทธิพลโดยตรงในทางบวกต่อพฤติกรรมการจัดการตนเอง การสนับสนุนความเป็นอิสระโดยพ่อแม่มีอิทธิพลโดยอ้อมในทางบวก และเป้าหมายชีวิตภายนอกตนมีอิทธิพลโดยอ้อมในทางลบต่อพฤติกรรมการจัดการตนเอง โดยผ่านตัวแปรความพึงพอใจในชีวิตด้านความสัมพันธ์ ผลการศึกษานี้เสนอแนะว่าพยาบาลสามารถใช้แบบจำลองเป็นแนวทางพัฒนารูปแบบการพยาบาลโดยสนับสนุนความความพึงพอใจในชีวิตด้านความสัมพันธ์และเป้าหมายชีวิตภายในตน ลดเป้าหมายชีวิตภายนอกตนสำหรับวัยรุ่น และส่งเสริมทักษะการสนับสนุนความอิสระสำหรับพ่อแม่

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คำสำคัญ: วัยรุ่นโรคหืด การสนับสนุนความเป็นอิสระ รูปแบบเชิงสาเหตุ แรงจูงใจภายใน เป้าหมายชีวิต พฤติกรรมการจัดการตนเอง

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Lived Experiences of Severe Depression and Suicide Attempts in Older Thai–Muslims Living in Rural Communities

Saifon Aekwarangkoon, Naiyana Noonil*

Abstract: Depression-related suicide appears to be increasing among older people in a number of countries and occurs consistently in multicultural contexts and among various religious communities. In this study we explored and described the experiences of eight older Thai-Muslims with a history of severe depression and suicide attempts who lived in southern Thailand. The phenomenological method of Colazzi was used to gather, analyze and present data and we employed in-depth interviews.

Analysis of the interview transcripts revealed four themes that stood out as figural for the participants: (a) "death is freedom from life", (b) "loss and loneliness leads to suicide", (c) "a healing approach through Islamic beliefs", and (d) "need someone to support". The findings revealed that the participants generally contemplate suicide in a state of abject misery. Nurse-client therapeutic relationships are important and meaningful for creating personal trust, safety and confidence through being with such people, and collaborating with them to make various choices, to enhance their self-value and touch their inner life-energy. In the healing process, nurses should consider developing positive connections, attempting to alleviate pain and sufgfering, and providing them with effective support in an acceptable Islamic manner.

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Introduction

New cases of depression–related suicide among older people have been consistently higher than in other age groups in multicultural contexts and among various religious communities, and have increased annually worldwide, including in Thailand.[1,2] The suicide rate and behavioral patterns are different among various cultures.[3] For example, suicide rates in European countries with a significant Muslim population were found to be higher than in South Asian and Middle Eastern Islamic countries.[4] In addition, the way that most older people committed suicide was by hanging in their homes.[5] According to various studies, suffering from depression is a major cause for committing suicide, especially among older people.[1,2,3] In Thailand, depression is a common problem in older people with the potential of escalating into attempted–and–completed suicide.[1,6,7,8] Suicidal feelings and hopelessness have been considered part of aging, which may be understandable in the context of being elderly and having physical disabilities and, thus, possibly causing them to be a suicide risk.[1,2]

In Islamic cultures, suicide rates appear to be lower than in those of other religions, and the topic of suicide is considered to be a sensitive topic to discuss in the same way it is in many other cultures.[9,10] Thai-Muslims are concerned not only about their own religion's teachings but also their feelings of stigmatization.[10,11] Even though they may have a strict belief in religion, when they reach an older age, they may no longer feel that they have any meaningful purpose in life and would be better off dead.[11,12] Factors often associated with attempted suicide among older Muslims are poor morale, severe physical or psychological pain, fractured relationships, a sense of loss, living alone, and socioeconomic status.[3,5] Such diverse factors require health care providers to conduct considerable screening and treatment regarding the elderly.[1,12] These circumstances necessitate research regarding attempted suicide by older Thai-Muslims with depression. Exploring their experiences will enhance a deeper understanding of their context, and assist in treating depression effectively, prevent suicide in a family or communities, no matter the existent religious prohibitions, and thus contribute toward better mental health and healthy behaviors.[10,12]

Earlier studies conducted in many parts of Thailand to help counteract depression in older Thai-Muslims in families and communities have been inadequate.[9] More research is needed to meaningfully enlighten stakeholders on the needs of older people, how best to encourage responsibility for mental health, and help such people by promoting positive mental health.[10] The purpose of this study was to explore the experiences of older Thai Muslims with a history of severe depression and suicide attempt. It is important to analyze the lessons learned from those who have survived the challenges of life and their attempted suicide. Their experiences will benefit in developing understanding of those factors that help prevent suicide and contribute to developing practical guidelines for stakeholders in dealing with depressed older people so as to reduce the risk factors of suicide in Islamic culture.

Suicide and depression in the Thai-Muslim world

In contrast to modern medicine's view that severe depression is caused by a number of factors, include brain changes, brain chemistry, hormonal imbalances, or inherited traits[13], in Islam severe depression is also a disease that needs to be treated. However, an Islamic belief is that everything in human life is destined by Allah, and so Muslims must accept and strictly adhere to this premise.[14] Islamic belief decrees that every problem, crisis, and suffering is assigned by Allah and can be positively disentangled and solved, thus resulting in enhanced internal growth.[15] In terms of psychological well-being, it is believed that psychological problems such as depression and suicide will only occur to Muslims who lack proper understanding in religious principles because Allah is with everyone and prepares the path to heaven for them.[14] Additionally, Islam stipulates that life consists of both this life and the afterlife.[16] Every deed practiced eventually is accounted for in the afterlife.[15] Ultimately, this world has been created for temporal reasons while, on the other hand, the afterlife is the eternal home and residual place for all of mankind after this experiential world has been destroyed.[14] Allah promises every Muslim a place in heaven unless they commit unforgivable sins. Muslims who commit suicide are denied a place in heaven and are condemned to live in hell forever because suicide is considered an unforgivable sin in Islam.[14,15,16] The qualitative research reported here is part of a larger action research study on developing youth volunteers to care for older people with depression in the community. The study revealed that the youths had enough capacity to access and help the older Muslim with mild to moderate depression. However, studies regarding Thai Muslims with severe depression are lacking. Therefore, this study aimed to explore the experience of the older Thai Muslim who believed in Allah and were depressed and sought to uncover why they would try to commit suicide.

Methods

Design

This study used Colazzi's phenomenological method to gain insight into the experiences of older Thai-Muslims through the use of dialogic interviewing procedures and thematic interpretations to capture a rich and thick description of the essence of each participant's suicide attempts experience.[17]

Sample and Setting

The settings were four rural communities in southern Thailand in Nakhon Si Thammarat Province where most of the population is Muslim. The participants were purposefully selected on the basis of having experienced the phenomenon of interest and being willing to talk about this.[17] They also met the following inclusion criteria: (a) being Muslim and aged >60 years; (b) living in a rural community; (c) having a significant PHQ-9 score (≥19 being severe depression)[18], (these data were obtained from a self-report questionnaire at home to confirm depression level scores); and (d) self-reported as having had a suicide attempt within the past year.

Selecting the participants involved firstly, the researchers giving health care providers information about the study and requesting them to contact potential participants by telephone to ask permission to give their personal details and home addresses to the researchers. Secondly, after this permission was received, the researchers visited participants at home and described the study. The principal investigator (PI) and the other researchers created positive relationships, and the PI assessed depression using PHQ-9 and interviewed prospective participants about their suicide behavior history again to make sure they met the study's criteria. Four potential participants refused to join but eventually 12 people agreed to join the study, however only eight people remained in the final sample as data saturation was achieved after analysis of eight participants.[17]

Ethical considerations

The Committee on Human Rights Related to Research Involving Human Subjects, Walailak University, Thailand (Protocol Number 16/077) gave ethics approval. The ethical issues during this study involved the participants' independence, intimacy, and anonymity. The participants were informed of the objectives and details of the study, the voluntary nature of their participation as well as the risks and benefits of the study. They had the right to refuse to join the study or could withdraw at any time. They were assured that non-participation in the study would have no deleterious effects on their lives nor the healthcare services afforded to them. Each participant willingly gave permission for the interviews to be recorded and informed consents were gained from all participants. They were also informed that they could refuse to answer questions, and that the interview would be terminated if they felt distress.

Data Collection

Instrument: The *Patient Health Questionnaire-9 - Thai version* (PHQ-9) was used prior to in-depth interviews. It is a self-rated 9-item assessment for depression following the criteria of the Diagnostic and Statistical Manual of Mental Disorders. Respondents rate their symptoms for the previous 2 weeks as: 'none of the time' (0), 'rarely for 1-7 days' (1), 'often for >7 days' (2), or 'for most or all of the time' (3). A total score of 0-6 is classified as no depression, 7-12 as mild depression, 13-18 as moderate depression, and ≥19 as severe depression. These scores have proven to be effective to discern between depressed and non-depressed Thai older people.[18] This instrument was reliability tested with 30 older people in other Thai villages and the alpha coefficient for this particular study was .89.

In-depth Interviews: A guide was used for in-depth interviewing of participants, and contained questions such as: "What happened to you?, "How can you pass this time?, and "How has your religion, Islam, affected your depression and suicide attempt?" This guide was developed by the researchers based on a literature review. Its validity was approved by five experts: two psychiatrists, two psychiatric nurses, and psychologist. In addition, it had been piloted in interviews with ten older Thai-Muslims, not study participants, to assure that they understood the questions.

To gather phenomenological in-depth data, an interview was arranged in a private and distraction-free room in each participant's home with each visit lasting approximately 60-90 minutes, with the duration of each interview corresponding to each participant's condition. To probe their experiences, the interviewer started by creating rapport before proceeding to ask them common, open-ended questions, closely followed by some additional questions. Then, the participants were encouraged to reflect upon events or observations currently related to our study. Data collection and analysis were simultaneously conducted in order to develop topics relevant to the perspective of the participants and their experiences of suicide and severe depression management in their lives. The number of interviews ended after the themes were recognized and information saturation was achieved.

Data analysis

Colaizzi's existential phenomenological methodology was used for data analysis and this consists of 7 steps that were followed in this study (**Table 1**).[19,20]

Table 1 Colaizzi's method of data analysis consists of seven steps.

1. The participants' responses were transcribed verbatim. The validity and accuracy of the process was assured through repeated audio-tape listening and script reading.
2. Significant statements were identified from participants' transcripts of direct relevance to the research phenomenon.
3. Formulated meanings relevant to the phenomenon were developed after careful consideration of the significant statements close to phenomena of the participants' experiences.
4. Formulated meanings were grouped based on their similar themes and arranged into four themes: *Death is freedom from life*; *Loss and loneliness leads to suicide*; *A healing approach through Islamic beliefs;* and *Need someone to support.*
5. A full and inclusive description of the phenomenon is written, incorporating all the themes produced at step 4.
6. Rigorous discussions held by the two researchers to discuss any disagreements and continued until agreement was reached. Another significant factor in the interpretation process was concerned with the researchers' individual perception, experiences, and backgrounds, so the researcher's standpoints and biases were actively acknowledged.
7. Finally, validity was ensure through two methods: peer-briefing, and also presenting the final draft findings to the participants to gain their confirmation or modification of the outcomes of the analysis.

Trustworthiness

Member checking, peer checking, and prolonged engagement were employed to establish honesty and credibility.[21] For member checking, the participants were asked to audit the conclusions drawn from the earlier interviews. To increase the validity of the findings these were shared with these eight participants individually who then could compare their own experiences. Three experts in this field carried out peer checking. Lastly, the PI could establish a high degree of trust with the participants and evolved a better understanding of the research results through close and continual involvement with the participants. Prolonged engagement in the field is essential as an assurance for data relevancy and adequacy so that the goal of the study can be achieved.[21]

The conformability and credibility of the data could be solidified and enhanced by ensuring maximum variation of sampling. The comprehensiveness and veracity of the content were ensured by circumstantially recognizing various new data. Finally, by identifying and collating various re-occurring themes voiced by the participants to describe their particular aspects and experiences about challenges in dealing with their suffering from suicide-related severe depression, analysis could be concluded.

Findings

The eight participants had a range age of 67-91 years and the majority (75%) were female. The way of their suicide attempts were medicine overdose (75%) and hanging (25%). Further most (75%) were divorcees/widows and had a primary school education (62.5%). In addition, all participants suffered from their chronic illnesses such as hypertension, diabetes mellitus, dyslipidemia. Their monthly income was 1,000-3,700 Thai baht (around 31.54-116.69 USD) that half of them perceived as adequate.

In linking together the underlying meanings of the participants' accounts of their experiences of living with severe depression and attempting suicide, four themes emerged and are explained below with relevant participant quotes:

Death is a freedom from life

The participants experienced and endured suffering from severe depression for a long time and they could not share this suffering with others. Their suffering made them want to die and they recognized that only death could ease their torturous lives. In attempting suicide, they believed that only a fraction of a second of breath in a new world would relieve them from enduring such sadness. Only death would lead them to reach freedom from life because in the afterlife, they could leave all mental pain behind. It is a second of longing for freedom while another idea reminds them that death is an offence against Allah. However, the thought of death kept surfacing in their minds while they could not commit suicide. Being stuck on this threshold between life and death frustrated them. Severe depressive symptoms not only disturbed their inner feelings but also generated an adverse impact on their daily life functions as well as in their relationships with others. Participants perceived the effects of deep depression sufferings related to their need to die, but also with ambivalence due to their strongly-held belief in Islam. For example, Armenao, a female, said:

> *Suffering makes me want to die; only death helps me reach freedom, escape from all pain and suffering, but I can't do it because of Allah, I only wait for death.*
>
> *It is really hard for me to live. I am really sad, I want to cry and cry every day. My entire daily life activities have changed negatively. All I want is to stay alone...away from others. Living means nothing but I cannot commit suicide either.*

Participants also reported that they had no choice to live. They also did not know why they were here and how to live:

> *Every day I wake up, no choices; I don't know anything, even the reason to wake up; no goals in sight. I also don't know the meaning of my life. It is hard to live in this situation. I only live minute to minute and hope that the suffering will disappear and I would die meeting a new freedom from life with no pain. Suicide comes into my head all of the time and that makes me feel guilty to Allah.* (Banglao, male)

Loss and loneliness leads to suicide

Participants believed that a sense of loss and loneliness influenced them to attempt suicide. They reported this sense of loss from two aspects: firstly, loss of belonging that is an intrapersonal, psychological process consisting of loss of self-esteem and self-control, hopelessness, powerlessness, and worthlessness. Another meaning was sense of loss in interpersonal interactions consisting of a loss of positive connections, attachments, love, understanding, caring, respect, genuineness, and support from others, especially loved ones. This sense of loss affected them so as to feel a sense of isolation between them and others that make them attempt suicide:

> *While I am drowning deeply in this situation, I lose all meaning of life, self-esteem, self-control, hope, and people to love. It is hard to live and I really need to die but I can't take my own life. These situations make me feel lonely because I realize that I really have nothing in my life, even self-belonging.* (Loufa, female)

> *Realize that I live with my loved ones but still feel lonely. I always try to blend in with the family and take part in community activities but I can't connect with anyone even my family members. I perceive our relationship in a negative way, with no meaning to interact with others. I try to understand myself and others, but I still can't get rid of this loneliness.* (Chabaprai, female)

Healing mind through Islamic beliefs

Participants tried to heal and balance their internal spiritual nature through a process to overcome depression and suicide by respecting Allah. They strongly believed that Allah always grants them compassion, love, protects them from harm and heals their minds. In addition, Muslims who commit suicide must live in hell forever because suicide is an unforgivable sin. Based on this belief, they strongly adhered to Allah by praying five times per day. At these times, their negative feelings and thoughts were left behind. Instead, they feel connected to their own spiritual growth in compassion, detachment, and peace from Allah which caused a positive internal change for healing their depression and reduced the risk of suicide. This activity healed the severe depression and sustains them in their lives, for example:

> *Allah always embraces and protects me from pain and suffering. I always receive love and compassion from Allah to heal my pain. This energy helps me survive.* (Yamela, female)

> *Islam does not permit people to commit suicide; it is an unforgivable sin. Every time I feel depressed and want to commit suicide, I remind myself that Allah will still help and be there for me.* (Rifa, female)

Need someone to support

There was the belief that, although there was no hope and they may not have had anybody, participants still needed love, understanding, caring, and support from the others, especially love ones. Attachment to loved ones creates a feeling of care and warmth in their minds and helps heal their depression and reduces the risk of suicide. They feel lonely in a crowd. Consequently, they focus their consciousness on the embrace and love of Allah. This inclination reflects that support is really an important factor for creating in life the feelings of trust, safety, and confidence. It also eases fear and anxiety in uncertainty in a life filled with suffering because when people know there is always someone to be with, it confirms that their life is worth living as Abraham (male) said:

> *Except for Allah, there is no one who pleases me, helps me and is with me. I really have nobody and am in need of love, understanding, caring, and support from humans, too.*

Participants confirmed that they still need love from people important to them. They also need to live and die in the embrace of loved ones who understand, care, and, so, they try to seek help from others as illustrated in the following quotes:

> *I need love, warmth, and support from my loved ones or others who genuinely understand, listen to my heart and accompany me in these situations.* (Saofeyao, female)

> *I try to isolate myself because nobody can hear and connect with me. Although there is nobody with me, in reality, I really need someone who understands and helps me get through this period.* (Armenao, female)

Discussion

Older Thai Muslims in this study experienced suffering from their severe depressive symptoms of emotional, cognitive, behavioral, and physical changes that influenced their lives, making it difficult to live anymore with mental anguish.[22] Studies reveal that older people who kill themselves experience persistent despair and unendurable physical or mental pain.[3,22] Because their deep suffering led them to a loss of positive feelings and motivation, this made them feel hopeless, helpless, and desperate to avoid excruciating pain.[19,22] The participants in our study perceived that only death would liberate them from pain and suffering, but they were prevented from committing suicide because of religious principles and the stigmatization of their society and community.[11] In accordance with Islamic belief, they believed that psychological problems including depression and suicide must not occur to Muslims who truly understand the principles of their religion because Allah is with everyone.[9] Due to this belief and the concern of stigmatization, they had to keep their depression and contemplation of suicide a secret in their lives and try to relieve the suffering by themselves thus resulting in even more severe mental pain and turmoil.[22,23] Thus, they remain in frustration waiting for death to reach them and achieve complete freedom from life. This cycle is also reflected in the research of both Western and Eastern society.[11,12,23]

A sense of loss and loneliness are very important triggers that influenced participants to attempt suicide. It is exhibited as emotional changes, breeding pain and suffering for older people with severe depression.[23] The participants reported a loss of meaningfulness in intrapersonal psychological processes such as a loss of self-control, self-esteem and life-energy, hopelessness, worthlessness, and powerlessness. Older people with severe depression have a greater likelihood of reverting to a negative state with loneliness inducing the inclination towards suicide.[24,25] In some other cases, participants perceive a loss in the meaning of interpersonal interaction such as a loss of positive connections, attachment, love, and support with loved ones such as family members, friends, neighbors, and community. The findings of this study reflect that relationships, acceptance, and connection of self with others play a very significant role in triggering loneliness among depressed older people.[10,12] In addition, other studies reveal that a decline in psychological processes can isolate older people from a pleasurable environment causing them to perceive even greater loneliness.[22] These sentiments of loss and loneliness can induce older people to attempt suicide.[22,23,26]

However, within a Thai-Muslim context, the beliefs and teachings of the Islamic religion can foster spiritual healing and greater emotional and mental balance.[10,12] Strong adherence to Allah cultivates strength of the internal world of the adherent.[9] They pray and are in the presence of Allah five times per day. Prayer and reflection bring them into closer connection with Allah and His enveloping embrace which gives them more confidence for living.[10] Religion acts as a buffer in a transformative process to change suffering and suicide from severe depression.[10,27] This healing process creates peace and compassion spiritually and protects the individual from harm including suicide.[9,12] The results of various studies reveal that the rate of suicide attempts and suicide contemplation among depressed people are affected by religious affiliation.[26,28] While people are communing with Allah in prayer, they do not have negative thoughts, negative feelings, nor negative inclinations. They are connected through a state of positive spiritual enhancing mind peacefulness that fosters internal healing and positive internal changes that can heal depression and reduce the risk of suicide.[9,28]

Although participants may strongly believe in Islam, they still need understanding, positive connection, attachment, love, and support from others, especially the loved ones in their lives. This also reflects that relationships have a major impact in ameliorating depression.[24,25] Interpersonal relationships impact internal growth and increase an individual's energy for living.[29,30] The happiness of older people depends on the care and cohesiveness in positive relationships with their family members and with others.[10] This study's findings reveal that the participants needed positive connections in order to prevent anxiety and fear in daily life degenerating into severe depression.[10,22,24] Other research indicates that people of different cultures may kill themselves as a result of persistent fractured relationships.[3] Alternately, genuine relationships enhances a sense of trust, safety, and security to live with hope and warmth which support them in reducing the risk of depression and suicide.[23,30]

Limitations

The limitation of this study relates to its setting which covers only four communities in one district. As the cultural background of the participants were of direct concern, this study was unable to represent a larger population. Another limitation is that an item of the semi-structured questionnaire was a closed question and quite directional: "How has your religion, Islam, affected your depression and suicide attempt?". The question contains an assumption that Islam did affect their mental state, which is an issue when interviewing in phenomenology because one cannot make assumptions or have biased views about people's experiences.

Conclusions and Implications for Nursing Practice

This study found that in the experience of these older Thai-Muslims they had to live within two worlds. In the present world, they faced suffering from a sense of loss and loneliness with nobody to support them and this helped to lead them to attempt suicide. They believed that the world of death was freedom from pain and various sufferings. However, Muslims believe that Allah always grants them compassion, love, and heals their minds from suffering and being lonely. Therefore, the findings reflected that older Thai-Muslims need support from someone and early detection of depression. Moreover, they also need better, deep understanding in the meaning of their religion for healing them in the therapeutic process. Developing nurse-client therapeutic relationships for enhancing positive connections, attempting to alleviate suffering, and providing them with effective support in an acceptable Islamic manner should be a concern of nurses. Therefore, nurses who take care of these groups should learn and understand Islamic beliefs to help older people live in the world of reality with their love one(s). In addition, nurses need to find strategies and develop specific protocols to detect depression in Thai-Muslims, and take advice from people from the same culture. This is particularly pertinent when caring for those older Thai-Muslims who live alone. Nurses have an important role in providing information about strategies to reduce depression for all people, individuals, families, and communities.

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References

1. Department of Mental Health, Ministry of Public Health. The Department of Mental Health watched the elderly risk suicide. 2017 [cited 2017 December 19]. Available from https://www.dmh.go.th/news-dmh/view.asp?id=26932
2. World Health Organization. Depression let's talk: Campaign essentials. 2017 [cited 2017 April 25]. Available from http://www.who.int/campaigns/world-health-day/2017/toolkit.pdf?us=1
3. Snowdon J. Differences between patterns of suicide in East Asia and the West. The importance of sociocultural factors. Asian Journal of Psychiatry. 2018; 37: 106-111.
4. Pritchard C, Amanullah S. An analysis of suicide and undetermined deaths in 17 predominantly Islamic countries contrasted with the UK. Psychological Medicine. 2007; 37: 421-430.
5. Karbeyaz K, Celikel A, Emiral E, Emiral GO. Elderly suicide in Eskisehir, Turkey. Journal of Forensic and Legal Medicine. 2017; 52: 12-15.
6. Bunloet A. Prevalence and factors associated with depression among the elderly community residents with chronic diseases in Samliam Urban Primary Care Unit, Khon Kaen. Srinagarind Medical Journal. 2016; 31: 25-33.
7. Wongpanarak N, Chaleoykitti S. Depression: A significant mental health problem of elderly. Journal of the Royal Thai Army Nurses. 2014; 15: 24-31.
8. Yodmai K, Somrongthong R. Depression and factors associated with the quality of life among the elderly in Numpong and Somsoong District, Khonkean Province, Thailand. European Journal of Scientific Research. 2016; 138: 193-199.
9. Dewiyanti D, Kusuma HE. Space for Muslims spiritual meanings. Procedia-Social and Behavioral Sciences. 2012; 50: 969-978.
10. Laeheem K. The effects of happy Muslim family activities on reduction of domestic violence against Thai-Muslim spouses in Satun. Kasetsart Journal of Social Sciences. 2017; 38: 150-155.
11. Sheehan L, Dubke R, Corrigan PW. The specificity of public stigma: A comparison of suicide and depression-related stigma. Psychiatry Research. 2017; 256: 40-45.
12. Mir G, Meer S, Cottrell D, McMillan D, House A, Kanter JW. Adapted behavioural activation for the treatment of depression in Muslims. Journal of Affective Disorders. 2015; 180: 190-199.
13. Mayo Clinic. Depression (major depressive disorder). 2018 [cited 2019 March 25]. Available from https://www.mayoclinic.org/diseases-conditions/depression/symptoms-causes/syc-20356007
14. Tzeferakos GA, Douzenis AI. Islam, mental health and law: a general overview. Annals of General Psychiary. 2017: 16-28.
15. Eapen V, El-Rufaie O. Country Profile: United Arab Emirates (UAE). International Psychiatry. 2008; 2: 38-40.
16. Ciftci A, Jones N, Corrigan PW. Mental health stigma in the Muslim community. Journal of Muslim Mental Health. 2012(7). Doi:http://dix.doi.org/10.3998/jmmh.10381 Z607.0007.102
17. Thomas SP, Pollio HR. Listening to patients: A phenomenological approach to nursing research and practice. New York: Springer Publishing Company, Inc; 2002.
18. Lotrakul M, Sumrithe S, Saipanish R. Reliability and validity of the Thai version of the PHQ-9. BMC Psychiatry. 2008; 8: 46.
19. Colaizzi PF. Psychological research as the phenomenologist views it. In: Valle R, King M (eds). Existential-Phenomenological Alternatives for psychology. New York: Oxford University Press; 1978: 48-71.

20. Morrow R, Rodriguez A, King N. Colaizzi's descriptive phenomenological method. The Psychologist. 2015; 28: 643-644.
21. Anney VN. Ensuring the quality of the findings of qualitative research: Looking at trustworthiness criteria. Journal of Emerging Trends in Educational Research and Policy Studies. 2014; 5: 272-281.
22. Apesoa-Varano EC, Barker JC, Hinton L. Shards of sorrow: Older men's accounts of their depression experience. Social Science & Medicine. 2015; 124: 1-8.
23. Santini ZI, Fiori KL, Feeney J, Tyrovolas S, Haro MJ, Koyanagi A. Social relationships, loneliness, and mental health among older men and women in Ireland: A prospective community-based study. Journal of Affective Disorders. 2016; 204: 59-69.
24. Elias SMS, Nevile C, Scott T. The effectiveness of group reminiscence therapy for loneliness, anxiety and depression in older peoples in long-term care: A systematic review. Geriatric Nursing. 2015; 36: 372-380.
25. Ni Y, Tein JY, Zhang M, Yang Y, Wu G. Changes in depression among older peoples in China: A latent transition analysis. Journal of Affective Disorders. 2017; 209: 3-9.
26. Sabry WM, Vohra A. Role of Islam in the management of psychiatric disorders. Indian Journal of Psychiatry. 2013; 55: S205-S214. Doi: 10.4103/0019-5545.105534
27. Bulmer M, Bohnke JR, Lewis GJ. Predicting moral sentiment towards physician-assisted suicide: The role of religion, conservatism, authoritarianism, and big five personality. Personality and Individual Differences. 2017; 105: 244-251.
28. Lawrence RE, Brent D, Mann JJ, Burke AK, Grunebaum MF, Galfalvy HC, et al. Religion as a risk factor for suicide attempt and suicide ideation among depressed patients. Journal of Nervous & Mental Disease. 2016; 204: 845-850. Doi: 10.1097/NMD.0000000000000484
29. Izquierdo A, Miranda J, Bromley E, Sherbourne C, Ryan G, Kennedy D, et al. Grandparenting experiences among adults with a history of depression: A mixed-methods study. General Hospital Psychiatry. 2015; 37: 185-191.
30. Knipe DW, Gunnell D, Pearson M, Jayamanne S, Pieris R, Priyadarshana C, et al. Attempted suicide in Sri Lanka-An epidemiological study of household and community factors. Journal of Affective Disorders. 2018; 232: 177-184.

ประสบการณ์การพยายามฆ่าตัวตายของผู้สูงอายุไทยมุสลิมที่มีภาวะซึมเศร้าระดับรุนแรงในชุมชน

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บทคัดย่อ: อุบัติการณ์การพยายามฆ่าตัวตายจากภาวะซึมเศร้าเพิ่มสูงขึ้นอย่างต่อเนื่องในกลุ่มผู้สูงอายุทุกบริบท ศาสนา และวัฒนธรรม นำไปสู่อัตราการเสียชีวิตที่เพิ่มขึ้นในหลายประเทศ การวิจัยนี้มุ่งเน้นการทำความเข้าใจประสบการณ์การพยายามฆ่าตัวตายของผู้สูงอายุไทยมุสลิมที่มีภาวะซึมเศร้าระดับรุนแรง และอาศัยอยู่ในชุมชนภาคใต้ของประเทศไทยจำนวน 8 คน ใช้วิธีการวิจัยเชิงปรากฏการณ์วิทยาและวิธีการของโคไลซ์ซี่ในการรวบรวม วิเคราะห์ และนำเสนอข้อมูลที่ได้จากการสัมภาษณ์เชิงลึก ผลการศึกษาพบ 4 ประเด็นหลัก ประกอบด้วย ความตายคืออิสรภาพของชีวิต ความรู้สึกสูญเสียและโดดเดี่ยวเหนี่ยวนำให้เกิดการฆ่าตัวตาย การเยียวยาทางจิตใจในวิถีของอิสลาม และความต้องการการสนับสนุนและประคับประคองจากผู้อื่น ผลการศึกษาครั้งนี้สะท้อนให้เห็นว่าผู้สูงอายุไทยมุสลิมที่พยายามฆ่าตัวตายจากการมีภาวะซึมเศร้าในระดับรุนแรงต้องเผชิญกับความทุกข์ที่ยังต้องการการคลี่คลาย สัมพันธภาพเชิงบำบัดระหว่างพยาบาลและผู้สูงอายุมีความหมายต่อการสร้างความรู้สึกไว้วางใจ ปลอดภัย และเชื่อมั่นด้วยการอยู่กับสิ่งที่ผู้สูงอายุกำลังเผชิญ ร่วมสร้างทางเลือก เพิ่มคุณค่า และช่วยให้ผู้สูงอายุสามารถสัมผัสกับพลังชีวิตภายในตนเอง ในกระบวนการเยียวยา พยาบาลควรสร้างการเชื่อมโยงเชิงบวกคลี่คลายความทุกข์ทรมานและความเจ็บปวดที่บีบคั้น รวมทั้งค้นหาวิธีการเยียวยาและประคับประคองทางด้านจิตใจที่มีประสิทธิภาพตามวิถีของมุสลิม

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Effect of Integrated Safety Program on Safety Behaviors among Rice Farmers: A Quasi-Experimental Study

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Abstract: Unsafe working behaviors are considered the most important determinants of injuries among rice farmers. This quasi-experimental study examined the effect of an integrated safety program for enhancing safety behaviors among rice farmers. Two districts in a province in Northern Thailand were purposively selected and randomly assigned to be the experimental and control groups. Eighty-two farmers from two districts were purposively selected according to the criteria and matching equally for each group. The experimental group only received the integrated safety program which comprised awareness raising, working behavior modification, and a supportive environment. Safety behaviors were measured by a structured questionnaire. Data were analyzed using descriptive statistics and two-way repeated measures analysis of variance (ANOVA).

Results revealed that the participants in the experimental group had statistically significant higher mean scores of safety behaviors that included safe pesticide use, personal protective equipment use, and compliance with safety rules and regulations, than those in the control group across all time points of measurement at weeks 8 and 12 after during follow-up. Thus, this safety intervention could be useful for nurses and occupational health professionals, and health promoters to enhance safety behaviors among rice farmers and thus reduce farmer morbidity and mortality due to unsafe work practices.

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Introduction

Farming is a hazardous industry.[1] It is recognized as a dangerous occupation as a result of the high incidence of injuries reported in comparison to other occupations such as construction and mining.[2,3] Trends of injuries among rice farmers are increasing in both developed and developing countries.[4,5] In 2018, the National Statistical Office of Thailand reported that there are 12.56 million agricultural workers and more than half are rice farmers (58.80%).[6] The prevalence of injuries in agricultural workers is 24.54%, and more than half of the injuries occur among general farmers (53.59%), which includes rice farmers.[7] The type of injury among rice farmers includes superficial injuries and open wounds from sharp objects (62.74%), injuries acquired following physical trauma, falls and motor vehicle or tractor accidents (18.49%), and acute poisoning from pesticide exposure (8.11%), respectively.[6] Such injuries among farmers produce both economic and health burdens resulting in disability and poor quality of working life.[5,8] Evidence suggests that the main causes of injuries among rice farmers are related to unsafe behaviors.[9-11] These behaviors include not using personal protective equipment (PPE) and not complying with safety rules and regulations while working with pesticides, machinery and sharp equipment.[10-12] This evidence underscores the need for an intervention aimed at preventing injuries among rice farmers, hence this was the focus of this study.

To develop an effective intervention for preventing injuries among farmers it is important to understand the causes of unsafe behaviors. The literature indicates that causes are related to lack of awareness,[10-11] and lack of training.[10,13] Raising awareness is key to successful behavioral change.[11-14] Nonetheless, previous studies only paid attention to knowledge, which may be unable to stimulate behavioral change effectively.[15] Most safety interventions among rice farmers, for instance, have focused solely on educational interventions, which are ineffective for changing long-term behavior.[16,17] Moreover, existing interventions reported in the literature had only short-term outcome evaluation.[15,18] Systematic reviews of safety interventions among rice farmers suggests that multi-factorial integrated approaches are the most promising means for promoting safety behaviors and preventing injuries.[15,18]

Promoting safety behaviors and reducing risks to workers health can be accomplished using the concept of Workplace Health Promotion (WHP).[19] This concept has three main components including awareness raising, behavioral modification, and creating a supportive environment.[19] Such concepts have generally focused on promoting worker’s health and the decreasing of risk to health among workers through various activities.[19-20] To raise awareness, information is provided to the individual in a manner that catalyzes modification of behavior and enhances individual confidence in their ability to successfully change behaviors.[19] The literature provides evidence of the success of adopting the three main components of WHP,[20-21] but there is little data to show the effectiveness among rice farmers who are informal workers and therefore receive less attention from occupational health services than formal workers.[22-24] Thus, an intervention using the three components of WHP, raising awareness, adopting safety behaviors, and creating an environment for long lasting behavioral change, is paramount. Moreover, outcome evaluation measuring program effects on safety behaviors in the rice farmers was still questionable, and also existing program focus on short-term outcome evaluation.[15-16] Therefore, a quasi-experimental study was used in this study to examine the effect of safety behaviors among rice farmers.

Literature review and theoretical framework

Safety behavior refers to the characteristics of actions or performances of individuals under conditions without danger, risk of accident, injuries, disabilities, and death due to work, that affects the person, property and the environment.[25] A variety of occupational health hazards in the workplace have contributed to occupational health problems among workers. Considering the causation of occupational health problem, it was found that unsafe behaviors were a main cause of such problems.[19, 20] Unsafe behavior refers to the performance of a task or other activity that is conducted in a manner that may threaten the health and safety of the workers, such as a lack of PPE use, using defective equipment, unnecessary haste in working, and lack of compliance with safety rules and regulations. [25] To prevent occupational health problems effectively, the safety program needs to increase safety awareness, modify behavior, and create a supportive environment.[19]

Raising awareness refers to the process of increasing of recognition the occupational hazards in order to protect and prevent occupational health problem both short and long term health consequences.[19] Methods for raising awareness among workers include a variety of risk communication methods: group discussion, safety media including photographs, posters, audiovisual materials, and videos.[19,20] Evidence shows that raising awareness through group discussion and using video or multi-media were effective in increasing awareness and behavior change among farm workers.[21,25,26]

Behavioral modification refers to techniques such as altering behavior and reaction to stimuli through positive and negative reinforcement.[19] The techniques used to decrease or increase a particular behavior of the target population helps workers modify behaviors such as using PPE when exposed to certain occupational hazards and following safety rules and regulations while at work and while farming.[20,27] Common methods used to assist individuals change their behavior include reinforcement of safe behaviors, incentives, and social support.[20,24] A previous study employing a behavioral modification strategy that included group discussions, demonstrations and return demonstrations related to the use of PPE, showed significantly improved safety behavior among farmers.[24,28]

Creating a supportive environment refers to creating an environment within the workplace that enhances behavioral change.[19] These activities include posting safety and warning signs in the work area[19,20] that encourage safety behavior among workers.[29] A previous study suggested that posting safety rules and regulations and warning signs in the workplace facilitated wooden furniture workers to maintain safety behaviors.[21] Our study adopted the concept of WHP to be the theoretical framework.

Study aim: To examine the effect of an integrated safety program on safety behaviors among rice farmers.

The study hypothesis: The mean scores of safety behaviors in the experimental group would be significantly higher than those of the control group at eight and twelve weeks after completing the program.

Method

Design: A quasi-experimental with a two-group design.

Participants and Settings: Two districts with the highest proportion of rice farming in a northern province of Thailand were purposively selected and randomly assigned to be the sites for the experimental and control groups of farmers. The sample size of this study was estimated using a power-analysis with a significance level of .05, a power of .80, and effect size of .43 was estimated from a previous study.[27] The estimated sample size was 36 participants per group but an additional 20% participants were added to compensate for possible attrition. Therefore, 41 participants were included in each group to ensure a sufficient number. The participants were purposively selected according to the inclusion criteria of: aged 18 years and older, both male and female, engaged in rice-farming for at least one year, involved at least one rice growing process such as land preparation, planting, maintaining the planted seedlings and harvesting, being able to read and speak Thai, and willing to participate in the study. A matching method was used to control confounders, which included gender and age (±3 years), between two groups. There were 94 potential participants in both districts who met the inclusion criteria (45 from the experimental group district and 49 from the control group district). The result of matching yielded 41 participants for each group.

Research instruments

There were two instruments used in this study:

1. A demographic questionnaire. This was developed by the researchers, and collected data on gender, age, marital status, educational level, underlying disease, work experience, and safety training experience.

2. **Structured Questionnaire of Safety Behaviors among Rice Farmers** was modified from a structured questionnaire regarding working behavior from a previous study by Chanprasit et al. (2013).[30] It is comprised of items regarding the use of pesticides (15 items), personal protective equipment (PPE) (12 items), and compliance with safety rules and regulations (16 items). The total number items is 43 and examples of these are: read the label before using pesticides, use of expired pesticides, check the readiness of the personal protective equipment before use, wear gloves while mixing pesticides, and check sharp equipment before use. The rating of responses is done on a scale between 1-3 ('never done', 'sometimes done', and 'always done'). A higher score indicates a higher level of safety behaviors. The structured questionnaire was reviewed and validated by five experts: two occupational medicine instructors, two occupational health nursing instructors, and a toxicologist with expertise in pesticides. The content validity index was 1.00. The Cronbach's alpha coefficients in the pilot with 15 participants and actual study were 0.72 and 0.95, respectively.

The Integrated Safety Program (ISP)

The ISP was developed based on the concept of WHP: raise awareness, behavioral modification, and create a supportive environment, aiming to encourage safety behavior among rice farmers. There were five sessions, which focused on three safety practices including safe pesticide use, PPE use, and compliance with safety rules and regulations. The ISP was reviewed and validated by five experts: two occupational medicine instructors, two occupational health nursing instructors, and a toxicologist with expertise in pesticides.

Three weekly, two-hour lessons were provided to the participants in the experimental group. The program and activities of the ISP are described in **Table 1**.

Table 1 Program and activities of the Integrated Safety Program

Week/ session	Content and Activities
Week 1: Session 1: raising awareness (One hour)	*Raising awareness (60 minutes):* ■ Showing and sharing technique, all participants watch a video regarding occupational hazards and adverse health effects in the rice farming process to raise safety awareness (10 minutes), and then are divided into groups (8-9 persons per group). They discuss and reflect on their feelings about video (20 minutes), then groups present their summarization (25 minutes/five minutes/ group). The researcher summarizes the lessons learned (5 minutes).
Week 1: Session 2: Modify safety behavior (One hour for communication skill training to promote safety behaviors)	*Occupational health and safety information (20 minutes):* ■ This session is a step beyond raising safety awareness and assists the participants making decisions to changing working behaviors; safety pesticide use, PPE use, and compliance with safety rules and regulations. *Sharing the experiences of a role model (20 minutes):* ■ Sharing experiences then session also includes good safety practices regarding safety pesticide and PPE use, and compliance with safety rules and regulations to create the inspiration and motivation to change working behavior of participants.

Table 1 Program and activities of the Integrated Safety Program (Cont.)

Week/ session	Content and Activities
	■ Demonstration and return demonstration regarding safety pesticide and PPE use (20 minutes): ■ Provide PPE materials such as mask, gloves, boots, and glasses for all participants. Show them the techniques of demonstration and return demonstration of PPE use to create self-confidence of participants in undertaking safety behaviors. ■ Allow all participants to do return demonstration of PPE use both individual and group to make sure that they understand and perform activities correctly. Give rewards for participants who complete correctly and motivate those who cannot, until all have mastered the PPE use correctly.
Week 1: Session 3: Creating a supportive environment (One hour for skill training to maintain changing working behavior)	*Create a physical working environment that encourages and maintain safety behavior (30 minutes)* ■ Allow participants to discuss and share their idea about supporting and maintaining behavioral modification over time. ■ All participants receive information about a physical working environment improvement. Provide posters regarding warning signs regarding occupational hazards and adverse health effects of rice farming to all participants.
Week 3: Session 4: Booster session (One hour to encourage to maintain safety behavior)	*Group discussion (60 minutes)* ■ Arrange ice-breaking activities for five minutes to strengthen relationship among them and ensure their intention to perform boost and maintain changing working behavior for 15 minutes. Discussion with all participants who change or do not change working behaviors regarding three main safety practices related to safety pesticide use, PPE use, and compliance with safety rules and regulations, to make sure that they understand and do this correctly. Give appropriate rewards for participants who change such safety behavior and continue to motivate those not changing behaviours until they hopefully make a decision to change working behavior and practice farming safely. ■ Allow participants to discuss and share their ideas about the problems or obstacles that need improvement and lead to their working behavioral modification. Summarize what they feedback, and provide knowledge about how to modify safety practices and increase of the confidence of PPE use (30 minutes) ■ *Intention (10 minutes):* Give positive feedback to all participates during activities, and strengthen their intentions to continue to change their working behavior.

Ethical considerations

The Research Ethics Committee of the Faculty of Nursing, Chiang Mai University, approved this study (No. EXP-023-2016). The participants were informed about the study objectives and processes, confidentiality, risks, benefits, and their rights. They were able to ask questions and withdraw from the study as per their wish. Consent and agreement was obtained from the participants prior to data collection.

Data collection

The researchers coordinated with the leader of the community to contact the participants in order to explain to them the research objectives and processes, confidentiality, risks, benefits, and participants' rights. Participants who agreed to participate in this study were asked to sign consent forms. Then participants had one on one interviews with the research assistants to collect baseline data. The participants in the experimental group received the ISP, whereas those in the control group did not receive the ISP.

Data was collected by six research assistants (RAs) who were graduate students with the experience of interviewing, and who were trained in the use of the instrument. The RAs collected the baseline data from the 82 participants in both groups through one-on-one interviews using the structured questionnaire, and spending 10-15 minutes per person. In addition, outcome assessors were blinded to the participants' group assignment to reduce information bias in particular social desirability between RAs and the participants during data collection. At weeks 8 and 12 post-intervention, the outcomes of the safety behaviors of participants in both the experimental and control groups were measured again using the questionnaire in interviews with the same RAs who collected the baseline data.

Data analysis

The demographic data of both groups were analyzed using descriptive statistics. Chi-square was used to examine the differences in participants' gender, age, marital status, education, and occupation, between the experimental and control groups using the baseline data. It was also used to examine the differences in the participants's gender and age in within both groups before the intervention. The independent t-test was used to examine the differences in the gender and ages of participants between the two groups. The two-way repeated ANOVA was used to examine the difference in safety behaviors among participants between both groups using the baseline data and at weeks 8 and 12 post-intervention, and to analyze data related to the hypotheses of the study.

Results

Demographic characteristics of participants

The gender of participants was equal between the two groups and the age range in both groups was the same, ranging from 35 to 73 years. Both groups were also similar in terms of gender, age, educational level, working experience, and safety training attended in all demographic baseline data (see details in **Table 2**).

Comparison of safety behaviors between the experimental and control groups

At the baseline, safety behaviors in terms of pesticide use, PPE use, and compliance with safety rules and regulations were not statistically different between the experimental and control group (**Table 3**).

Result of hypothesis testing

The mean score for pesticide use, PPE use, and compliance with safety rules and regulations in the experimental group was increased from the baseline to weeks 8 and 12 after the program. The score distribution for three components of safety behaviors, which comprised of pesticide use, PPE use, and compliance with safety rules and regulations, increased significantly from the baseline to week 8, and only slightly increased from week 8 to 12. This result showed significant differences in pesticide use, PPE use, and compliance with safety rules and regulations scores in the experimental

Table 2 Demographic characteristics of both groups

Demographic data	Experimental n	Experimental (%)	Control n	Control (%)	χ^2	*p*-value
Gender					.500[a]	1.000
Male	17	(41.46)	17	(41.46)		
Female	24	(58.54)	24	(58.54)		
Age (years)					.106[c]	.512
30-39	1	(2.43)	1	(2.43)		
40-49	4	(9.76)	4	(9.76)		
50-59	19	(46.34)	19	(46.34)		
60-69	12	(29.26)	12	(29,26)		
70-79	5	(12.19)	5	(12.19)		
M±SD	53.84±11.18		53.16±10.89			
(Range)	35-73		37-72			
Education level					.112[b]	.204
Primary (Grades 1-6)	36	(87.81)	39	(95.13)		
Secondary (Grades 7-12)	5	(12.19)	2	(4.87)		
Working experience (years)					.028[b]	.234
< 20	15	(36.58)	7	(17.07)		
20-29	6	(14.63)	7	(17.07)		
30-39	8	(19.51)	5	(12.20)		
40-49	8	(19.51)	14	(34.16)		
> 50	4	(9.76)	8	(19.51)		
Working hours per week					.119[b]	·643
< 48 hours	38	(92.67)	37	(90.24)		
> 48 hours	3	(7.33)	4	(9.76)		
Safety training attended					.726[b]	.082
Yes	17	(41.47)	11	(26.83)		
No	24	(58.53)	30	(73.17)		

a = Chi-square, b= Fisher's exact, c= Independent t-test

Table 3 Comparisons of mean and standard deviation of safety behaviors at baseline between groups

Variable	Experimental *M (SD)*	Control *M (SD)*	T-test	*p-value*
Pesticide use	30.68 (0.87)	30.33 (1.23)	0.795	.830
PPE use	24.31 (3.87)	25.73 (3.68)	0.652	.742
Compliance with safety rules	28.70 (2.52)	28.92 (2.21)	0.847	.867

group between the three time periods of data collection. However, the results of Bonferroni test showed significant difference in pesticide and PPE use scores from weeks 8 to 12, whereas the results in the control group showed no significant difference in pesticide and PPE use score, except when comparing week 8 to 12 data, which showed a significant difference in compliance with safety rules and regulations score of the control group (**Table 4**).

Table 4 Comparisons of safety behaviors between each point of measurement within the groups

Group / safety behaviors	Mean (SD)			*p*-value		
	Baseline (1)	8th week (2)	12th week (3)	(1) vs (2)	(1) vs (3)	(2) vs (3)
Experimental group						
Pesticide use	30.68 (0.87)	34.75 (1.61)	35.12 (0.88)	.000**	.000**	.811
PPE use	24.31 (3.87)	30.21 (3.49)	31.70 (3.26)	.000**	.000**	.000**
Compliance safety rules	28.70 (2.52)	33.39 (2.03)	34.36 (1.77)	.000**	.000**	.000**
Control group						
Pesticide use	30.33 (1.23)	30.55 (1.24)	29.00 (6.64)	.125	.994	1.000
PPE use	25.73 (3.68)	25.70 (3.68)	25.68 (4.71)	.970	1.000	1.000
Compliance safety rules	28.92 (2.21)	28.73 (2.12)	29.21 (2.49)	.029	.132	.005*

Bonferroni test, ** = $p < .001$, * = $p < .01$

When comparing safety behaviors between each point of measurement between two groups, indications showed that there was a significant difference in such behaviors between the two groups at the baseline, and weeks 8 and 12 (p= .000). In the experimental group, the findings showed that the mean score of such behaviors was higher than those in the control group at the same time, and there was a steady increase from the baseline to that in weeks 8 and 12 in such behaviors after intervention. This finding indicates a significant difference between the scores of such behaviors between the two groups in the three time periods of data collection. While the findings in the control group showed that mean scores of PPE use and compliance with safety rules and regulations decreased from the baseline to 8th week after intervention, the mean score of pesticide use only slightly increased from the baseline to the 8th week. However, the result showed that there was a significant difference in the mean scores of such behaviors between the two groups. The results of changes in pesticide use, PPE use, and compliance with safety rules and regulations between the two groups at the baseline, and weeks 8 and 12 are shown in **Table 4**. When using two-way repeated measure ANOVA to compare changes in safety behaviors between each point of measurement between the experimental and control groups, a significant difference was found in the mean scores between the two groups. Also, there was a significant change of safety behaviors over time, $F(1, 41) = 4125.41$, $p < .000$. (**Table 5**).

Table 5 Multiple comparisons of mean difference of safety behaviors in each point of measurement between the groups

Variables	SS	df	MS	F^r	p-value
Within subject					
Group	552.445	1	552.445	122.14	.000**
Time x group	567.226	2	567.226	50.58	.001*
Error	361.829	82	4.52		
Between subject					
Group	82545.00	1	82545.00	4125.41	.000**
Error	361.82	41	5.83		

Note. ^{r} = Two-way repeated measure ANOVA. * = $p < .001$, ** = $p < .000$.

Discussion

The findings revealed that upon completion of the program, the experimental group had significantly higher safety behaviors in terms of pesticide use, PPE use, and compliance with safety rules and regulations than those of the control group at the 8th and 12th week after intervention. These significant results indicated the effective components of the intervention program, an interactive safety training. The first component of the program, awareness raising, encouraged the participants to realize the occupational health risks of farming and health benefits of PPE use as a result of a variety of risk communication, dissemination and information through interactive training. This supports findings in the literature regarding various techniques such as the showing of media regarding occupational health risks, group education, and group discussion, were effective methods[21,31] to increase awareness among participants, leading to the performance of safety practices related to pesticide and PPE use.[27] Further, using multimedia, for example, video that use animation and sound, effectively created an awareness and understanding of safety at work among the participants.[24]

Besides, the techniques of demonstration and return-demonstration of PPE use affected the self-confidence of the participants in undertaking safety behaviors, including safe use of pesticides and PPE use and compliance with safety rules and regulations, because the participants had a chance to learn about safety at work which contributed to their decisions to change their behavior. Moreover, creating a supportive environment through group discussion and learning with role models can increase motivation to learn about safety at work. In particular, the physical environment, posters and warning signs regarding risk to health and PPE use, stimulate participants to maintain safe working behavior.[22-23]

The result of this study supports past evidence[15,25] indicating that awareness raising is the most effective predictor of promoting safety behavior and risk reduction.[21] Our findings are also in accordance with the results of Santaweesuk et al.[27] that safety awareness influences the performance of safe behavior at work either in the safe use of pesticides or PPE use.[32] Further, creating a supportive environment by displaying posters of pesticide danger, PPE use, rules and regulation compliance could help maintain safety behaviors.[22,27] Another study also demonstrated that improving the physical environment by displaying warning signs regarding occupational health hazards and PPE use, and formulating effective safety rules and regulations at work, such as checking and maintenance equipment and machinery regularly, can support and maintain safety behaviors.[33]

The findings of this study indicate that an effective intervention program comprising awareness raising, safe behavior modification, and the creation of a supportive environment has the potential to initiate occupational hazard awareness leading to decision-making to change unsafe behavior thereby adopting and maintaining safety behaviors. The intervention program could be applicable for another setting in Thailand where the need for safe workplace behavior is a concern, but further testing of the intervention is required.

Limitations and Strengths of the Study

One limitation is that only two districts in a northern province of Thailand were purposively selected, thus generalization of the study might be limited as a result of individual differences in term of attitudes toward safety in farming work in other locations. In addition, the study did not adopt probability sampling for the recruitment of participants. This may raise questions about the representativeness of the study population. Also, this study used a quasi-experimental with a two-group design, thus the threat to internal validity may come from the history of the participants of the experimental and control groups. However, a strength of this study is that we used a matching method to control confounders, which included gender and age (±3 years), between two groups. Moreover, data was collected by RAs who were trained in the use of structured questionnaire, and outcome assessors were blind to the participants' group assignment to reduce information bias in particular social desirability between RAs and the participants in both groups during data collection between each points of measurement.

Conclusion and Implications for Nursing Practice

The ISP in this study was found to be effective in increasing safety awareness and leading to changing behaviors among rice farmers in the 8th and 12th week after implementation. This program could be applicable to rice farmers in other settings. Occupational health nurses or health professionals should consider delivery of interactive safety training for rice farmers who are a disadvantaged group, and often are not accessible to formal occupational health services, in order to raise awareness and enhance their safety behavior. At the level of policy implication, standard safety interactive training should be established for all rice farmers.

References

1. Centers for Disease Control and Prevention [CDC] (2014). Agricultural Safety. [cited 2016 June 25]. Available from: http://www.cdc.gov/niosh/topics/aginjury/
2. Holtea A K, Follob, G. Making occupational health and safety training relevant for farmers: Evaluation of an introductory course in occupational health and safety in Norway. Safety Science. 2018; 109: 368-376
3. International Labour Organization [ILO]. Global employment trends 2012 preventing a deeper jobs crisis. International Labour Office, Geneva. 2012.
4. National Institute Occupational Safety and Health [NIOSH]. National health system employers health and well-being: Commission occupational health services; 2014.
5. Safe Work Australia. National Hazard Exposure Worker Surveillance Exposure to biological hazards and the provision of controls against biological hazards in Australian workplaces. (2013). [cited 2014 October 12]. Available from: http://www.safeworkaustralia.gov.au/sites/SWA/about/Publications/Documents.pdf
6. National Statistical Office of Thailand (NSO). The informal employment survey 2017 in Thailand. (2018). [cited 2019 February 19]. Available from: http://www.nso.go.th/sites/2014en/Pages/survey/Social/Labour/The-Informal-Employment-Survey.aspx
7. Bureau of Occupational and Environmental Disease (BOED) Thailand. Situation of occupational health disease and environment. (2018). [cited 2019 February 19]. Available from: http://envocc.ddc.moph.go.th
8. U.S. Bureau of Labor Statistics. (2014). Reported workplace injuries and illness -2013 in agriculture in the U.S. 2005-2010. [cited 2019 January 20]. Available from: www.bls.gov/iif/oshsum.htm
9. Day L, Voaklander D, Sim M, Wolfe R, Langley L, Dosman J. Risk factors for work related injury among male Farmers. Occup Environ Med. 2014; 66: 312-318
10. Molineri A, Signorini M L. Tarabla H D. Risk factors for work-related injury among farm workers: a 1-year study. Rural and Remote Health. 2015; 15 (2996): 1-8
11. Chino C, Jiamjarasrangsr W. Characteristics and factors related to occupational injuries in farmers in Sankamphaeng district, Chiangmai, Thailand. Thammasat Medical Journal. 2015; 15 (2): 242-250
12. Arporn, S. Occupational Health and Safety in Agricultural worker: Oil Palm Smallholders and Worker. (2011).
13. Das, B. Agricultural work related injuries among the farmers of West Bengal, India. International Journal of Injury Control and Safety Promotion. 2014; 21 (3): 205-215
14. Morgaine C K, Langley D J, McGee O R, Gray R A. Impact evaluation of a farm safety awareness workshop in New Zealand. Scand J Work Environ Health. 2014; 40 (6): 649-653
15. Rautiainen R, Lehtola M M, Day L M, Schonstein E, Suutarinen J, Salminen S, Verbeek J H. Interventions for preventing injuries in the agricultural industry. [cited October 12 2016] Available from: https://pdfs.semanticscholar.org/dc1e/b4adfed97b5634677aa5c934621cb3986c87.pdf
16. McCallum, M D, Murphy S, Reed B D, Claunch T D, Reynolds J S. What we know about the effectiveness of farm safety day programs and what we need to know. The Journal of Rural Health. 2013; 29: 20-29
17. Jørs E, Lander F, Huici O, Morant C R, Gulis, G, Konradsen F. Do Bolivian small holder farmers improve and retain knowledge to reduce occupational pesticide poisonings after training on Integrates Pest Management (IPM), Environmental Health. 2014; 13 (75): 2-9

18. Raksanam B, Taneepanichskul S, Siriwong W, Robson M. Multi-approach model for improving agrochemical safety among rice farmers in Pathumthani, Thailand. Risk Management and Healthcare Policy. 2012; 5: 75-82
19. O' Donnell, M.P. Health promotion in the workplace. (3rd edition). Albany, NY: Delmar; 2002.
20. Rogers, B. Occupational and environmental health nursing: Concept and Practice. (2nd ed.). Philadelphia: Saunders; 2003.
21. Waruntorn J, Chawapornpan C, Thanee K, Thomas A. M. Participatory development of an occupational health hazard reduction program in the wood furniture industry. Pacific Rim Int J Nurs Res. 2014; 18(1): 42-52
22. Massimo C, Roberto B, Davide M, Sonia M, Serenella S. Safety knowledge and Changing behavior in agricultural workers. Safety and Health at Work. 2018; 9: 164-171
23. Govinda B, Kishor A, Xiaomei Y, Lingxin F, Violette G. Factors affecting pesticide safety behavior: The perceptions of Nepalese farmers and retailers. Science of the Total Environment. 2018; 631: 1560-1571
24. Occupational Safety and Health Administration. Agricultural operations hazards and solutions. [cited 2018 November 10]. Available from: http://www.osha.gov/SLTC/agriculturaloperations/recognition.html.
25. Heinrich H. W. Industrial Accident Prevention. (2017). [cited 2019 April 5]. Available from https://safetyrisk.net/heinrichindustrial-accident-prevention/
26. The Health Communication Unit [THCU]. (2011). An introduction to comprehensive workplace health promotion. [cited 2015 April 9]. Available from http://www.thcu.ca
27. Santaweesuk S, Chapman R, Siriwong W. Effects of an injury and illness prevention program on occupational working behavior among rice farmers in Nakhonnayok province. Thailand. Risk Management and Healthcare Policy. 2014; 7: 51- 60
28. Cryer C, Langley D J, Samaranayaka A, David G, Morgaine K, Lilley R. An Outcome Evaluation of a New Zealand Farm Safety Intervention: A Historical Cohort Study. American Journal of Industrial Medicine. 2014; 57: 458-467
29. Charoensuk, N. Effectiveness of safety training program in pesticides utilization of farmers in Donchedi District, Suphanburi Province. Science and Technology Naresuan University Journal. 2016; 24 (1): 91-101
30. Chanprasit C, Songkham, W, Kaewthummanukul, T. Health hazards identification, health status, work-related injury and illness: situational analysis in small and medium sized enterprises. Nursing Journal. 2013; 37(1): 1-14
31. Damalas A C, Koutroubas D S. Farmers' behavior in pesticide use: A key concept for improving environmental health. Environmental and Science. 2018; 4: 27-30.
32. Sharifzadeh M S, Abdollamhossein G, Damalas C, Rezaei R, Ahmadyousefi M. Determinants of pesticide safety behavior among Iranian rice farmers. Science of the Total Environment. 2019; 651: 2953-2960
33. Keun Park, Khai T. Occupational safety and health activities conducted across countries in Asia. Safety and Health at Work. 2015; 10:1-3

ผลของโปรแกรมบูรณาการความปลอดภัยต่อพฤติกรรมความปลอดภัยของชาวนา: การศึกษากึ่งทดลอง

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บทคัดย่อ: พฤติกรรมการทำงานที่ไม่ปลอดภัยเป็นปัจจัยเหตุสำคัญของการบาดเจ็บของชาวนา การศึกษากึ่งทดลองครั้งนี้มีวัตถุประสงค์เพื่อศึกษาผลของโปรแกรมบูรณาการความปลอดภัยต่อพฤติกรรมความปลอดภัยของชาวนา สองอำเภอของจังหวัดหนึ่งในภาคเหนือของประเทศไทยได้รับการคัดเลือกแบบเจาะจงและสุ่มให้เป็นกลุ่มทดลองและกลุ่มควบคุม กลุ่มตัวอย่างจำนวน 82 คนจากสองอำเภอได้รับการคัดเลือกแบบเจาะจงตามคุณสมบัติที่กำหนดและวิธีการจับคู่ในจำนวนเท่ากัน กลุ่มทดลองได้รับโปรแกรมบูรณาการความปลอดภัย ขณะที่กลุ่มควบคุมไม่ได้รับโปรแกรม โปรแกรมบูรณาการความปลอดภัยประกอบด้วย การสร้างความตระหนัก การปรับเปลี่ยนพฤติกรรมการทำงาน และการสนับสนุนด้านสิ่งแวดล้อม พฤติกรรมความปลอดภัยประเมินโดยใช้แบบสอบถามเชิงโครงสร้าง วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณาและการวิเคราะห์ความแปรปรวนแบบสองทาง

ผลการศึกษาพบว่า กลุ่มทดลองมีคะแนนเฉลี่ยพฤติกรรมความปลอดภัยทั้งการใช้สารเคมีกำจัดศัตรูพืชที่ปลอดภัย การใช้อุปกรณ์ป้องกันอันตรายส่วนบุคคล และการปฏิบัติตามกฎและระเบียบข้อบังคับความปลอดภัยสูงกว่าคะแนนเฉลี่ยของกลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติจากการติดตามผลในสัปดาห์ที่ 8 และสัปดาห์ที่ 12 ดังนั้นพยาบาลอาชีวอนามัยหรือบุคลากรด้านสุขภาพสามารถประยุกต์โปรแกรมนี้ในการเสริมสร้างพฤติกรรมความปลอดภัยของชาวนา

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คำสำคัญ: โปรแกรมบูรณาการความปลอดภัย พยาบาลอาชีวอนามัย ชาวนา พฤติกรรมความปลอดภัย การบาดเจ็บที่เกี่ยวเนื่องจากการทำงาน การสร้างเสริมสุขภาพในสถานประกอบการ

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Predictors of Diabetes Self-Management in Older Adults with Poorly Controlled Type 2 Diabetes Mellitus

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Abstract: Poorly controlled type 2 diabetes, a complex phenomenon, is rapidly increasing particularly in older adults worldwide and in Thailand, the setting of this study. Effectiveness of diabetes self-management demands various factors supporting optimal outcomes. This descriptive correlational study examined the influences of ecological factors including gender, time since diagnosis, family history of type 2 diabetes mellitus, abdominal obesity, diabetes complications, health literacy, social networks, and social support on diabetes self-management. Through purposive sampling, the participants consisted of 166 older adults with poorly controlled type 2 diabetes mellitus at two hospitals in central Thailand province. Data were collected using questionnaires on the Functional, Communicative and Critical Health Literacy Scale, the revised Summary of Diabetes Self-Care Activities Scales, the Social Network in Adults Life, and the Diabetes Severity Complication Index; and nutrition assessment including waist circumference and HbA1c. Descriptive statistics and Stepwise Multiple Regression Analysis were used for data analysis.

Results revealed that health literacy, abdominal obesity, time since diagnosis, and gender could together predict diabetes self-management, accounting for 14.7% of the variance. Prior to developing an effective intervention, an additional variable more specific to older adults needs to be examined such as self-efficacy that affects older adults' confidence regarding health behavior modification. Nevertheless, these findings suggest approaches for nurses to promote diabetes self-management education that includes enhancing health literacy, and modifying health behaviors for control of abdominal obesity based on other health conditions, particularly in male older adults with type 2 diabetes mellitus.

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Introduction

The aging population is expected to increase by 22% by 2050[1] worldwide and by 16.06% in Thailand[2]. The incidence of type 2 diabetes mellitus (T2DM) is also expanding around the world[3], and

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Thailand.[4] Older adults with T2DM tend to be poorly controlled (fasting plasma glucose ≥130 mg/dL), particularly those aged ≥60 years due to various causes including co-morbidities, and social isolation.[5] Moreover, the global health care cost for T2DM in 2017 rose to its highest level, indicating a high prevalence of T2DM and its complications associated with inadequate self-management in older adults.[3] T2DM leads to direct and indirect burdens at individual level and for health care, and these burdens include acute and chronic complications, and lessened well-being.[3]

Internal and external factors influence an individual's diabetes self-management including social networks, and social support within environmental contexts.[6] Individual factors including abdominal obesity[7], family history of T2DM,[8] time since diagnosis[9], diabetes complications[10], gender[11], and health literacy.[12] However, individual and environmental factors affecting diabetes self-management have mostly been studied in western countries. In Thailand, diabetes self-management remains at a low level[13] and research is limited regarding older adults with poorly controlled T2DM. Therefore, it is necessary to investigate the influences of social networks, social support levels, health literacy, and individual factors on diabetes self-management among such older adults.

Conceptual Framework and Literature Review

The conceptual framework of this study was developed based on a combination of three theories: bioecological theory[14], social networks[15], and health literacy[16]. The bioecological model[14] or Process-Person-Context-Time model (PPCT model) consists of four components: process, person, context, and time where all four elements interact with each other, leading to the development of human behaviors.[14] A process is a dynamic interaction between person and context (micro, meso, exo, and macro levels). A person is at the center of the PPCT model including demand characteristics, bioecological resources, dispositions, and demographic characteristic. The time element is that which changes regarding human development, experience, and culture across the life span.

The micro-level context of the PPCT includes abdominal obesity[7], family history of T2DM[8], time since diagnosis[9], diabetes complications[10], and gender[11] which are individual factors. Bioecological resources are skills, past experiences, intelligence, material, emotional or mental resources, and health literacy is considered as a bioecological resource associated with diabetes self-management.[12,31] Health literacy refers to "cognitive skills that determine a person's ability to access, understand and use information for health"[18, p 357], and consists of three components:[16] functional health literacy, a capability to access and understand health information; interactive health literacy, a capability to communicate health information; and critical health literacy, a capability to make decisions for behavioral change. Social networks including aspects of support from family members, partners, and friends sharing emotional closeness are also included in the micro-level and which contribute to diabetes self-management.[19]

The meso level includes social networks and aspects of support from peers, neighbors, community and religious groups[19], affecting diabetes self-management.[20] **The exo level** involves aspects of social networks in terms of support from healthcare providers.[19,21] Social networks in each aspect consist of structures, characteristics of network ties, and function.[15] Structures included size, density, and proximity. The larger the size and density, the greater the self-management.[22, 23] Living in close proximity to networks promotes self-management.[24] Characteristics of network ties included frequency of contact and the more frequency of contact with social networks, the greater the diabetes self-management.[22] Social networks function (social support) provides various opportunities for self-management.[25]

Therefore, this study aimed to examine bioecological factors including personal factors (gender, diabetes complications, abdominal obesity, family history of T2DM, time since diagnosis, and health literacy) and context factors (social networks and social support at different levels) in order to predict diabetes self-management in older Thai adults with poorly controlled T2DM.

Methods

Design

This study used a cross-sectional, correlational design.

Sample and Settings

The sample included older adults with poorly controlled T2DM who visited either the non-communicable disease clinic of a community hospital or the internal medicine, endocrinology or metabolism clinics at another hospital in a central Thailand province between January-June 2017. Convenience sampling was used to select the participants according to the following inclusion criteria: (1) Aged ≥60 years with poor glycemic control (HbA1c ≥8% within three months before data collection) and diabetic complications according to the Thai Diabetes Clinical Practice Guideline[26] (2) No cognitive impairment screened by the Mini-Mental State Examination (MMSE)[27] based on education level with scores >14 for a person who was illiterate; >17 for one who was primary school educated; and > 22 for a person graduated from high school, and (3) could verbally communicate in Thai. Older adults with a psychiatric problem or severe illness such as end-stage kidney disease and cancer were excluded. The power ($1-\beta$) and significance level (α) were determined at .80 and .05, respectively. The effect size from previous studies[12,28] was 0.189, and a sample size of 150 was determined.

Ethical Consideration and Protection of Human Subjects

This study was approved by the Committee on Human Rights Related to Research Involving Human Subjects, Faculty of Medicine Ramathibodi Hospital, Mahidol University (ID 11-59-14) and the Human Research Ethics Committee of Thammasat University (No.2: ID 092/2559). The written consents were obtained and participants received explanations of their a right to withdraw from the study at any time. The study purpose and data collection process were described in detail to them and all data were kept confidential, and their privacy maintained throughout the study.

Instruments: There were 7 questionnaires used, with relevant permissions obtained from the original authors, as well as anthropometric assessment for waist circumference. Content validity was examined by three experts in diabetic self-management, sociology, and gerontology.

The Mini-Mental State Examination (MMSE), developed by Folstein, et al.,[27] was used to screen mental state, consisting of 5 dimensions with 30 items including registration (3 items), orientation (10 items), recall (3 items), attention or calculation (5 items), and language and praxis (9 items). A response was "0" for an incorrect answer and "1" for a correct answer. Possible scores ranged from 0-27 for a person who was illiterate and 0-30 for a person graduated from at least primary school. The cut-off point for dementia was 14 or lower for an illiterate person, 17 or lower for a primary school graduated person, and 22 or lower for a high school graduated person. This scale has been licensed under Psychological Assessment Resource (PAR copyright).

A demographic data questionnaire was developed by the PI consisting of two parts: personal data (gender, age, and marital status), and illness data (family history of T2DM, time since diagnosis) and the record form for waist circumference and current HbA1c.

The Functional, Communicative and Critical Health Literacy Scale (FCCHL) was designed to assess health literacy for T2DM and developed by Ishikawa et al.,[29] based on Nutbeam's work[18], then translated into Thai by Maneesriwongul[30] and modified by Prabsangob.[31] The FCCHL has 14 items: functional health literacy (5 items), interactive/communication health literacy (5 items), and critical health literacy (4 items). A response is given on 4-point Likert scale ranging from "often" (4) to "never" (1). The scores are reversed for functional health literacy, and summed in each dimension and averaged, then classified into three levels: high (3.1-4.0), moderate (2.1-3.0), and low health literacy (1.0-2.0). An example question for functional health literacy is "In reading recommendations or medicine labels, you found that the print was too little to read."[29]

The original FCCHL[29] provided appropriate internal consistency on functional health literacy (Cronbach's $\alpha = .84$), communication health literacy ($\alpha = .77$), critical health literacy ($\alpha = .65$), and total scale ($\alpha = .78$). The Thai-FCCHL[31] was tested for psychometric properties, obtaining good internal consistency ($\alpha = .94$). In this study, the Thai-FCCHL provided good reliability ($\alpha = .92$).

The revised *Summary of Diabetes Self-Care Activities Scales - Thai version* (SDSCA-Thai version) was translated[32] from the original version of Toobert, et al.[33] It is used to assess the frequency of diabetes self-management in the past week. This scale consists of 5 dimensions with 19 items: exercise (2 items), medication (2 items), diet including general diet (3 items) and specific diet (4 items), foot care (5 items) and self-monitoring (3 items). Responses range from 0-7; higher scores indicate a higher level of diabetes self-management. Interpretation for each dimension included high (4.67-7), moderate (2.34-4.66), and low (0-2.33). Possible total scores range from 0-133. Overall scores of diabetes self-management are classified into high (88.67-133), moderate (44.34-88.66), and low (0-44.33).

The original version of SDSCA provided good content validity, and construct validity[33], and the revised SDSCA-Thai version provided high inter-item correlations within components (.43) and test-retest reliability (.89).[32] In the present study, the reliability using Cronbach's alpha was .65.

The Social Network in Adult Life Questionnaire (SNAL) was designed to assess social networking, developed by Antonucci and Akiyama[34], and translated into Thai by the PI with a back-translation technique. The SNAL questionnaire includes a set of three concentric circles in a diagram with five questions designed to measure the components underpinning social networks including size, density, proximity, frequency of contact by any approach, and social support. The term "You" is identified at the center of the three concentric circles. Each level of the circle represents the degree of emotional closeness and involvement in diabetes self-management; and our participants were asked five questions regarding the social network components in each level of the circle. Based on size, the participants were asked to identify how many people were involved in their diabetes self-management; the higher number indicated the larger size of social network. For density, the participants or their proxies were asked to identify how many people they have known and contacted one another; then the PI calculated density based on the formula (number of people they mentioned divided by all possible social networks they had). A typical density ranged from 0-1; high density closed to 1 indicated a high range to which social networks were joined together and could provide better support. Regarding proximity, the participants were asked how many people could drive or visit them within an hour when they needed help for diabetes self-management. Proximity ranged from 0 (referring to none) to 1 (referring to at least 1, then specifying the number of people). In addition to the frequency of contact, the participants were asked how frequently and by what modes did they contact their social networks; frequency of contact ranged from 1 (irregularly) to 5 (daily or living together). For social support, the participants were requested to value each social network contributing to diabetes self-management, ranging from 0 (no contribution to any activities) to 10 (maximal contributions to all activities). The higher score indicated a higher level of social support. The interpretation of this is based on a score in each component of social networks. The content validity index was 1; the participants' intra-rater reliability was 1.

The Diabetes Complications Severity Index (DCSI), developed by Young, et al.[35] is used to measure diabetes complications severity, and consists of seven aspects: nephropathy (11 items), retinopathy (10 items), cerebrovascular condition (2 items), neuropathy (10 items), peripheral vascular disease (10 items), metabolic condition (3 items) and cardiovascular condition (11 items). The response scale ranges from 0 (no) to 1 (yes) or 0 (no abnormality) to 2 (severe abnormality) based on ICD-9 criteria. The possible score range is 0-80; a higher score indicates higher severity of diabetes. The PI collected data from the participant's medical record. The content validity and criterion-related validity of the original DCSI were good.[35]

Glycosylated hemoglobin (HbA1c) was tested through the Health Service Center of the university where procedures are standardized and certified by the external quality assessment program in hemoglobin A1c from the National Glycohemoglobin Standardization Program (NGSP), USA. Blood samples were taken from all participants in the morning of the appointment. The most recent HbA1c within three months was also recorded from the medical profiles. The tentative participants with the most recent HbA1c ≥ 8% were included in this study.

A non-stretchable plastic tape was used to measure waist circumference (WC). A measurement was at the level of the umbilicus in the participants in an upright position[36]; normal criteria for waist circumference was <90 cm in males and <80 cm in females.[36]

Data Collection

The potential participants were screened according to the inclusion criteria. Once the inclusion criteria were met and the informed consent obtained, the PI undertook the structured interviews with the questionnaires on demographics, the FCCHL-Thai version[31], the revised SDSCA-Thai version[32], the SNAL-Thai version, and the DSCI.[35] A blood sample was taken for the current HbA1c; then waist circumference was assessed while the participants were in a private area, lasting approximately 20 minutes.

Data Analysis

Descriptive statistics were used for demographic data, social networks (size, density, proximity, frequency of contact, and social support levels), health literacy, and diabetes self-management. Since the interclass correlation (ICC) was .0, which was less than .2 according to Hierarchical Linear Modeling assumptions. Hence, Stepwise Multiple Regression Analysis (MRA) was applied to examine the influences of ecological factors on diabetes self-management. The assumptions were met including normality, linearity, homoscedasticity, independence of errors, and no multicollinearity among independent variables. Categorical variables were coded as follow: gender (0 = male, 1 = female); family history of T2DM (0 = no; 1 = yes); proximity (0 = no; 1 = yes); and frequency of contact (0 = daily; 1 = others).

Results

The mean age of the 166 participants was 71.26±6.99, ranging from 60-92 years. More than half were female (59.6%); were married (62.7%); had a family history of T2DM (51.2%). Time since diagnosis was 13.84±8.09 years; the waist circumference was 96.67±13.22 cm in females, and 93.01±12.35 cm in males. The overall health literacy was at a moderate level. The median of social network size, density, and social support level was 2, 1, and 10, respectively. The overall score for diabetes self-management was 4.97±.87. The medication subscale was the highest, following by self-monitoring, foot care, dietary control and exercise was the lowest due to limitations from health problems such as hip fracture, osteoarthritis knee, and post-coronary artery bypass grafting. The mean HbA1c was 9.99±1.89% (**Table 1**).

Table 1 Description of Ecological Factors, Diabetes Self-Management, and Current HbA1c (n = 166)

Variables	Possible Range	Mean±SD	Min-Max	Interpretation
Time since diagnosis		13.84±8.09	5-40	-
Waist Circumference				
- Female				
< 80 cm		n=7, 7.1%		Normal
≥ 80 cm		n=92, 92.9%		Abdominal obesity
- Male				
< 90 cm		n=24, 35.8%		Normal
≥ 90 cm		n=43, 64.2%		Abdominal obesity
Diabetes Complications	0-80	4.20±2.21	0-10	-
Health literacy				
- Overall	1-4	2.60±.85	1-4	Moderate
Social network				
- Size		2.90±1.96, median =2	0-10	-
- Density	0-1	.81±.34, median = 1	0-1	-
- Social support level	0-10	8.34±3.06, median = 10	0-10	-
Diabetes self-management				
- Overall score	0-133	94.43±16.22	49-133	High
- Overall (days/week)	0-7	4.97±.87	2.58-7.00	High
- Dietary control	0-7	4.74±.92	1.86-7.00	High
- Exercise	0-7	2.21±1.94	0.00-7.00	Low
- Self-monitoring	0-7	5.82±1.48	1.67-7.00	High
- Foot care	0-7	5.22±2.31	0.00-7.00	High
- Medication	0.7	6.63±1.22	0.00-7.00	High
HbA1c (%)		9.99±1.89	8.00-14.1	-

The correlation matrix of ecological factors (personal factors and context factors) and diabetes self-management revealed that health literacy, time since diagnosis, and gender were positively correlated with diabetes self-management with low correlation coefficients. Also, a family history of T2DM and waist circumference were negatively correlated with diabetes self-management with the low correlation coefficient. The remaining ecological factors (diabetes complications, social network size, density, proximity, a frequency of contact, and social support level) were not correlated with diabetes self-management (Table 2).

Stepwise multiple regression analysis revealed that the strongest predictive factor was health literacy, following by waist circumference, time since diagnosis, and gender, respectively. According to the Stepwise MRA procedure, the result of final model revealed that health literacy ($\beta = 4.930$, $p < .01$), time since diagnosis ($\beta = .325$, $p < .05$), and gender ($\beta = 5.329$, $p < .05$) could positively predict diabetes self-management, whilst waist circumference ($\beta = -.219$, $p < .05$) could negatively predict diabetes self-management which jointly accounted for 14.7% of the variance (Table 3).

Table 2 Pearson's Correlation Coefficient for Diabetes Self-Management (n = 166)

Variables	ODSM	GENER	TIME	FAM	WC	DC	HL	SIZE	DEN	PRO	FRE	SS
ODSM	1											
GENDER	.140*	1										
TIME	.211**	.010	1									
FAM	-.190**	.042	-.165*	1								
WC	-.198**	-.141	-.165*	-.068	1							
DC	.023	-.087	.360**	-.050	.013	1						
HL	.229**	-.170*	.092	-.250**	.074	-.182*	1					
SIZE	.062	.066	-.029	-.036	.119	.119	.068	1				
DEN	-.100	.029	-.111	.117	.133	.078	-.031	.426**	1			
PRO	-.092	.038	-.012	.124	.091	.003	-.060	.239**	.495**	1		
FRE	.023	.161*	-.008	.051	-.074	-.116	.195	-.085	-.165*	-.406**	1	
SS	-.072	.050	-.101	.103	.083	.083	-.046	.388**	.703**	.527**	-.178*	1

*p < .05, **p<.01

ODSM = overall diabetes self-management, GENDER = gender, TIME = time since diagnosis, FAM = family history of T2DM, WC = waist circumference, DC = diabetes complication, HL = health literacy, SIZE = social network size, DEN = density, PRO = proximity, FRE = frequency of contact, SS = social support

Table 3 Stepwise Multiple Regression Analysis for Diabetes Self-Management (n = 166)

Variables	b	Std.	Beta	*t*	*p*
Constant	94.597	10.561		8.957	<.001
1. Health literacy	4.930	1.443	2.54	3.416	.001
2. Waist circumference	-.219	.097	-.169	-2.259	.025
3. Time since diagnosis	.325	.152	.159	2.138	.034
4. Gender	5.329	2.511	.158	2.122	.035

R = .384, R^2 = .147, R^2 adj. = .126, *F* = 4.503, *p* = .035

Discussion

The Stepwise MRA revealed that health literacy, time since diagnosis, gender, and waist circumference together predicted diabetes self-management. According to the PPCT Model[14], all the predictors were micro-level factors, strongly influencing diabetes self-management. Gender influenced diabetes self-management since the female was more energetic in self-care and seeking information more than males, consistent with the previous study.[17] Also, time since diagnosis influenced diabetes self-management. One explanation is that people with a longer history of T2DM might have more skills in diabetes care.[10] Moreover, abdominal obesity was a barrier for older adults with poorly controlled T2DM in self-management; it was possible that females, rather than males, who were obese had more limitations in physical activity resulting in a barrier to diabetes self-management.[37] Health literacy influenced diabetes self-management, consistent with an earlier study[11] since people could evaluate the quality of both content and sources of health information they obtained in addition to a need to comprehend health information; as a result, they could properly modify their health behaviors.[12]

However, family history with T2DM had no influence on diabetes self-management, consistent with a previous study[38]; this might be due to the experiences of family members with T2DM not inducing people to perform diabetic behaviors.[38]

Moreover, diabetes complications did not influence diabetes self-management because the mean severity of diabetes complications was low based on the DSCI scoring (4.2 out of 80).

Regarding the exo-level factors in the PPCT Model[14], we found that social network size and density had no influence on diabetes self-management because a majority of the social network resources in this study was focused on family members and spouses. This is consistent with a previous study[24], indicating that older adults with T2DM had limited chances for entering support resources.[24] Proximity and frequency of contact had no influence on diabetes self-management because both aforementioned factors had both promoting and inhibiting effects on self-management and self-management competency.[39] The social support level did not affect diabetes self-management as stated in the previous evidence[15] because not all types of social support have impacts on diabetes self-management.[15]

The final model predictability was only 14.7%. This might be due to there being more specific factors affecting diabetes self-management that need to be examined among older adults with poorly controlled type 2 diabetes. We further analyzed the association between diabetes self-management and the current HbA1c and found no significant association. This might be due to HbA1c depending on other factors such as T2DM onset[40] because people getting diabetes at an older onset are likely to have better glycemic control than younger age-at-onset[40] which the present study did not explore.

Limitations

This study used a cross-sectional design with convenience sampling; therefore, generalization was limited. Next, the power to recognize cause and effect among variables was restricted, and also the findings might be affected by self-reporting of the frequency of diabetes self-management, even though dementia screening was conducted. Besides, internal consistency for the SDSCA-Thai version was rather low (Cronbach' $\alpha = .65$), and test-retest reliability was not conducted. A primary purpose was to test the influence among multi-level factors on diabetes self-management; testing interactions among process, person, context, and time (the PPCT model) could be conducted in further research. Since the predictive power was 14.7%, additional variables, such as self-efficacy, could be tested prior to intervention development.

Conclusions and Implications for Nursing Practice

Predictors of diabetes self-management in older Thai adults with poorly controlled T2DM were personal factors, including health literacy, abdominal obesity, time since diagnosis, and gender, suggesting approaches to promote diabetes self-management among them. For implications in nursing practice, nurses should monitor and integrate health literacy into diabetes self-management education through health literacy assessment as baseline information prior to providing education as appropriate for people. Older males with poorly controlled T2DM should be a target to promote health behavior modification toward diabetes self-management. Further studies investigating the causal relationships of factors influencing diabetes self-management should be conducted prior to designing an intervention for older adults with poorly controlled T2DM.

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References

1. World Health Organization. Ageing and Health. 2018. [cited 2019 April 5]. Available from: www.who.int.

2. Department of Older Persons. 2018 [cited 2019 April 5]. Available from: http://www.dop.go.th/download/knowledge/th1550973505-153_0.pdf.
3. International Diabetes Federation. IDF 2017 Atlas. 2017 [cited 2018 April 9]. Available from: http://www.diabetesatlas.org/IDF_Diabetes_Atlas_8e_interactive_EN/.
4. Aekplakorn W. Thai National Examination Survey V: Health System Research Institute. 2016 [cited 2016 April 9]. Available from: https://www.hsri.or.th/researcher/research/new-release/detail/7711.
5. Abdelhafiz AH, Sinclair AJ. Management of type 2 diabetes in older people. Diabetes Ther. 2013;4:13-26. doi:10.1007/s13300-013-0020-4.
6. Koetsenruijter J, van Lieshout J, Lionis C, Portillo MC, Vassilev I, Todorova E, et al. Social support and health in diabetes patients: An observational study in six European countries in an era of austerity. PLoS ONE. 2015;10(8): e0135079. doi: 10.1371/journal.pone.0135079.
7. Burini RC, Kano, HT, Nakagaki MS, Frenhani PB, McLellan KC. Behavioral factors of abdominal obesity and effects of lifestyle changes with fiber adequacy. Insights Obes Gen Beyond. 2017;1:14-22.
8. Adejoh SO. Family unit in the context of diabetes management among the Igala, North-Central, Nigeria. Med Soc Online. 2012;6(3):24-35.
9. Ojewale LY, Oluwatosin AO, Fasanmade AA, Odusan O. A survey on patients' characteristics, perception of family support and diabetes self-management among type 2 diabetes patients in South-West Nigeria. Nursing Open. 2019:1-8. doi: 10.1002/nop2.23.
10. Power MA, Bardsley J, Cypass M, Duker P, Funnell MM, Fischl AH, et al. Diabetes self-management education and support in type 2 diabetes: a joint Position Statement of the American Diabetes Association of Diabetes Educators, and the Academy of Nutrition and Dietitians. Diabetes Care. 2015;38(7):1372-82. doi: 10.2337/dc15-0730.
11. Penno G, Solini A, Bonora E, Fondelli C, Orsi E, Zerbini G, et al. Gender differences in cardiovascular disease risk factors, treatments and complications in patients with type 2 diabetes: the RIACE Italian multicentre study. J Inter Med. 2013;274(2):176-91. doi: 10.1111/joim.12073.
12. Ledford CJ, Cafferty LA, Russell TC. The influence of health literacy and patient activation on patient information seeking and sharing. J Health Commun. 2015;20(suppl 2): 77-82. doi: 10.1080/10810730.2015.1066466.
13. Boontasean W, Carlssan A, Rosner ID, Ostman M. Sex-related illness perception and self-management of a Thai type 2 diabetes mellitus population: a cross-sectional descriptive design. BMC Endocr Disord. 2018;18(5). doi: 10.1186/s12902-017-0229-8.
14. Bronfenbrenner U. The bioecological theory of human development. In Bronfenbrenner U. editor. Making human beings human: bioecological perspectives on human development. CA: Sage; 2005, pp. 3-15.
15. Berkman LF, Krishna A. Social network epidemiology. In Berkman LF, Kawachi I, Glymour MM. editors. Social epidemiology. New York: Oxford University Press; 2014, pp. 234-89.
16. Nutbeam D. Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. Health Promot Int. 2001;15:259-67.
17. Tsutsui H, Nomura K, Kusunoki M, Ishiguro T, Ohkubo T, Oshida Y. Gender differences in the perception of difficulty of self-management in patients with diabetes mellitus: a mixed-methods approach. Diabetol Int. 2016;7:289-98. doi: 10.1007/s13340-015-0249-4.
18. Nutbeam D. Health promotion glossary. Health Promot Int. 1998;13(4):349-364. doi: 10.1093/heapro/13.4.349.
19. Rogers A, Vassilev I, Sanders C, Kirk S, Chew-Graham C, Kennedy A, et al. Social networks, work and network-based resources for the management of long-term conditions: a framework and study protocol for developing self-care support. Implement Sci. 2011;6:56. doi: 10.1186/1748-5908-6-56.
20. Wallace DD, Rodriguez HG, Walker E, Dethlefs H, Dowd RA, Filipi L, et al. Types and sources of social support among adults living with type 2 diabetes in rural communities in the Dominican Republic. Glob Public Health. 2019; 14(1):135-46. doi: 10.1080/17441692.2018.1444782.
21. Fazioa S, Edwards J, Miyamoto S, Henderson S, Dharmar M, Young HM. More than a1c: types of success among adults with type-2 diabetes participating in a technology-enabled nurse coaching intervention. PEC. 2019;102:106-12. doi: 10.1016/j.pec.2018.08.028.
22. Antonucci TC, Ajrouch KJ. Birditt KS. The convoy model: explaining social relations from a multidisciplinary perspective. Gerontologist. 2013. doi: 10.1093/geront/gnt118.

23. Ashida S, Heaney CA. Differential associations of social support and social connectedness with structural features of social networks and the health status of older adults. J Aging Health. 2008;20(7):872-93. doi: 10.1177/0898264308324626.
24. Vassilev I, Rogers A, Blickem C, Brooks H, Kapadia D, Kennedy A, et al. Social networks, and the 'work' and work force of chronic illness self-management: a survey analysis of personal communities. PLos ONE. 2013; 8:e59723.
25. Vissenberg C, Stronks K, Nijpels G, Uitewaal PJ, Middelkoop BJ, Kohinor MJ, et al. Impact of a social network-based intervention promoting diabetes self-management in socioeconomically deprived patients: a qualitative evaluation of the intervention strategies. BMJ Open. 2016;6:e010254. doi: 10.1136/ bmjopen-2015-010254.
26. The Royal College of Physicians of Thailand, Diabetes Association of Thailand, Endocrine Society of Thailand, Ministry of Public Health, and National Health Security Office. Clinical practice guideline for diabetes 2014. Thailand: Bangkok; 2014 [in Thai].
27. Folstein, MF, Folstein SE, McHugh, PR. "Mini-mental status": a practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res. 1975;12(3): 189-98. doi: 10.1016/0022-3956(75)90026-6.
28. Masoompour M, Tirgari B, Ghazanfari Z. The relationship between health literacy, self-efficacy, and self-care behaviors in diabetic patients. EBCJ. 2017;7(3):17-25. doi: 10.22038/EBCJ.2017.24826.1551.
29. Ishikawa H, Takeuchi T, Yano E. Measuring functional, communicative, and critical health literacy among diabetic patients. Diabetes Care. 2008;31(5):874-79.
30. Maneesriwongul W. A study project for caring need evaluation in people with HIV receiving anti-retroviral treatment. Thailand: Bangkok; 2013 [in Thai].
31. Prabsangob K. Relationship of health literacy and self-care behavior among type 2 diabetic patients in Banpong district, Ratchaburi province. SSRU. 2016;2638-50 [in Thai].
32. Keeratiyutawong P, Hanucharurnkul S, Melkus GD, Panpakdee O, Vorapongsathorn T. Effectiveness of a self-management program for Thais with type 2 diabetes. TJNR. 2005;10(2):85-97.
33. Toobert DJ, Hampson SE, Glasgow RE. The Summary of Diabetes Self-Care Activities: Measure results from 7 studies and a revised scale. Diabetes Care. 2000;23(7): 943-50. doi: 10.2337/diacare.23.7.943.
34. Antonucci TC, Akiyama H. Social networks in adult life and a preliminary examination of the convoy model. J Gerontol. 1987;42(5):519-27. doi: 10.1093/geronj/42.5.519.
35. Young BA, Lin E, Von Korff M, Simon G, Ciechanowski P, Ludman EJ, et al. Diabetes complications severity index and risk of mortality, hospitalization, and healthcare utilization. Am J Manag Care. 2008;14(1):15-23.
36. Bureau of Nutrition, Department of Health, Ministry of Public health. Metabolic syndrome. Thailand: Bangkok; 2011 [in Thai].
37. McCollum M, Hansen LB, Lu L, Sullivan PW. Gender differences in diabetes mellitus and effects on self-care activity. Gender Med. 2005;2(4):246-54.
38. Manjula GB, Premkumar J. Self-efficacy and self-care behaviour among patients with type 2 diabetes mellitus – a cross sectional survey. IJSR. 2015;4(12):2047-51.
39. Knutsen IR, Foss IC, Todorova E, Roukova P, Kennedy A, Portillo MC, et al. Negotiating diet in networks: a cross-European study of the experiences of managing type 2 diabetes. Qual Health Res. 2015. doi: 10.1177/1049732315610318.
40. Yotsapon T, Sirinate K, Ekgaluck W, Somboon V, Tawee A, Worawit K, et al. Clinical characteristics and outcomes of the oldest old people with type 2 diabetes–perspective from a tertiary diabetes center in Thailand. BMC Endocr Disord. 2016;16:30. doi: 10.1186/s12902-016-0115-9.

ปัจจัยทำนายการจัดการตนเองเรื่องเบาหวานในผู้สูงอายุที่เป็นเบาหวานชนิดที่ 2 ที่ควบคุมเบาหวานได้ไม่ดี

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บทคัดย่อ: ผู้สูงอายุที่เป็นเบาหวานที่ควบคุมไม่ดีมีเพิ่มขึ้นเนื่องจากเป็นปรากฏการณ์ที่ซับซ้อน การจัดการตนเองอย่างมีประสิทธิภาพต้องอาศัยปัจจัยต่างๆเพื่อนำไปสู่ผลลัพธ์ที่ดี การศึกษาเชิงความสัมพันธ์นี้มีวัตถุประสงค์เพื่อทดสอบอิทธิพลปัจจัยเชิงนิเวศวิทยา (เพศ ระยะเวลาเป็นเบาหวาน ประวัติเบาหวานชนิดที่ 2 ภาวะอ้วนลงพุง ภาวะแทรกซ้อนจากเบาหวาน ความรอบรู้ด้านสุขภาพ เครือข่ายทางสังคม และการสนับสนุนทางสังคม) ต่อการจัดการตนเองเรื่องเบาหวาน ตัวอย่างผู้สูงอายุที่เป็นเบาหวานที่ควบคุมได้ไม่ดี จำนวน 166 ราย จากโรงพยาบาล 2 แห่งในภาคกลาง เลือกแบบเฉพาะเจาะจง เก็บรวบรวมข้อมูลด้วยแบบประเมินความรอบรู้ด้านสุขภาพ แบบวัดกิจกรรมการดูแลตนเอง แบบประเมินเครือข่ายทางสังคม และแบบประเมินภาวะแทรกซ้อนจากเบาหวาน การประเมินทางโภชนาการด้วยเส้นรอบเอวและระดับน้ำตาลสะสม วิเคราะห์ข้อมูลด้วยสถิติบรรยายและการวิเคราะห์ถดถอยพหุคูณหลายตัวแปร ผลการศึกษาพบว่า ความรอบรู้ด้านสุขภาพ ภาวะอ้วนลงพุง ระยะเวลาเป็นเบาหวาน และเพศร่วมกันทำนายการจัดการตนเองได้ร้อยละ 14.7 จำเป็นต้องมีการศึกษาปัจจัยเชิงสาเหตุอื่นที่เฉพาะเจาะจงยิ่งขึ้น เช่น ความเชื่อมั่นแห่งตนที่มีผลต่อการปรับเปลี่ยนพฤติกรรม อย่างไรก็ตาม ผลการศึกษาครั้งนี้มีข้อเสนอแนะสำหรับพยาบาลในการส่งเสริมการจัดการตนเอง ประกอบด้วย การส่งเสริมความรอบรู้ด้านสุขภาพ การปรับเปลี่ยนพฤติกรรมสุขภาพเพื่อควบคุมภาวะอ้วนลงพุงตามสภาวะสุขภาพ โดยเฉพาะในผู้สูงอายุเพศชายที่เป็นเบาหวานชนิดที่ 2

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คำสำคัญ: ความรอบรู้ด้านสุขภาพ ผู้สูงอายุ ควบคุมได้ไม่ดี การจัดการตนเอง ประเทศไทย เบาหวานชนิดที่ 2

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Factors Influencing Postoperative Functional Ability of People with Simple Lower Extremity Fractures

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Abstract: Early restoration of functional ability of people with lower extremity fracture is essential for a speedy return to life activities, including work. Simple lower extremity fractures of working-age adults are surgically treated to regain postoperative functional ability as early as possible. Even with successful orthopedic surgery, postoperative functional improvement varies widely due to many factors. This predictive correlational study examined the predictability of educational status, psychological distress, hospital setting, quality of discharge teaching, pain with activity, and satisfaction with care on functional ability at postoperative six-week in working-age adults with simple lower extremity fractures. In three orthopedic care settings in Myanmar, 178 participants completed the Patient Data Record Form, Impact of Event Scale-Revised, Quality of Discharge Teaching Scale, Numeric Rating Scale-Pain, Patient Satisfaction with Nursing Care Quality Questionnaire, and Lower Extremity Measure. Data were analyzed by using descriptive statistics, Spearman's rank correlation coefficient and hierarchical regression analysis.

Results showed that psychological distress, hospital setting, quality of discharge teaching, and pain with activity were significant predictors of postoperative functional ability of people with lower extremity fractures. The significant predictors jointly explained 39.4% of the variance in postoperative functional ability. However, educational status and satisfaction with care were insignificant predictors. These findings may help nurses and other health professionals to develop programs for psychological intervention, discharge teaching, and postoperative pain control in line with the characteristics of various hospital settings. These may improve quality of nursing care and enhance clinical outcomes that help people with simple lower extremity fractures to regain independent lower extremity function and resume work as early as possible.

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Introduction

Injuries are threats to the health of people in every single country around the world, especially in low and middle-income countries. Injuries contribute 10.1% of the global burden disease, and are major causes of disabilities in adults aged 15-49 years.[1] In

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Myanmar, injuries stand as the third leading cause of hospitalization around the country with a high magnitude of road traffic injuries followed by farm injuries.[2,3] Therefore, lower extremity fractures (LEF) are in the top ten injury-related morbidities in Myanmar.[3]

Traumatic LEF puts physical, psychological, and socioeconomic impacts on people and families and causes burdens on families, healthcare settings, and the country. Physically, people with traumatic LEF experience ambulatory limitations at acute post-injury, after surgery, and following discharge. Even with minor injury, the people with LEF suffer significantly lower ability to perform intermediate activities of daily living (ADL) for a certain period and work-related activities until 12 months post-injury.[4] Psychological distresses such as anxiety, depression, and posttraumatic stress symptoms are common among them and influence people's functional ability.[5] In the aspect of socioeconomic impact, the people with LEF experience at least a loss of a productive year of work and decreased income particularly among active working adults. Furthermore, LEF-related lifestyle alters the lifestyle of families and caregivers. The people's functional limitations waste much of their time, energy, and income and of the families as well.[6] Also, LEF poses an enormous socioeconomic burden on countries especially in lower socio-economic countries with limited health care resources.[7]

With the aim of early restoration of pre-injury functional ability, simple LEF of working-age adults are surgically reconstructed. The earlier the restoration of the functional ability, the more likely the people regain independent and productive daily lives which can help them return to work earlier and gain the best possible quality of life.[8] Therefore, ensuring optimal regaining of people's functional ability after technically successful surgery is the critical component for health and well-being of people with LEF undergoing surgery. Even with the overwhelming success of orthopedic procedures, postoperative functional improvement varies widely due to many factors.[9] Understanding factors contributing to functional ability among people with LEF undergoing surgery is also necessary to design care interventions to help the people to regain their previous levels of functioning as early as possible. Numerous international studies have highlighted this issue and documented the influencing factors on postoperative functional ability (POFA) of people with LEF [5,10,11,12,13,14] including patient's educational status[10] psychological distress,[5] hospital setting,[11] quality of discharge teaching,[12] pain,[13] and satisfaction with care.[14] Examining these factors would articulate the characteristics of the people with LEF, the care process, and outcomes of orthopedic care settings in Myanmar since until recently, there has been a paucity of literature documenting influencing factors on POFA of such people in the country and where there are substantial numbers of people with LEF in orthopedic care settings. Therefore, this study aimed to identify influencing factors on the POFA of Myanmar with simple LEF.

Conceptual Framework and Review of Literature

For justifying quality care performance in orthopedics, POFA has frequently been considered as an outcome indicator in people with LEF. Donabedian model's[15] guided this study in assessing the quality of care performance on people with simple LEF. According to this model, information about care service and care quality can be identified from three associated domains which are postulated as good structure (e.g., hospital setting) should promote good process (e.g., discharge teaching), and good process should in turn promote good outcomes (e.g., POFA).[15,16] The Donabedian model is a valuable framework for assessing surgical and trauma care quality.[17] By adding an individual's personal characteristics as an antecedent of care, the model provides better understanding of POFA among people undergoing orthopedic surgery (e.g., joint arthroplasty).[18] Moreover, the model is useful to identify the influence of structure, process, and immediate outcome factors on targeted outcomes because the improvement of immediate outcomes in the hospital settings are reflected in improvement in positive patient outcomes.[17,19]

Patient characteristics and educational status play important roles in functional consequences of people undergoing orthopedic surgery.[10] For instance, people with low educational status and may be illiterate may have decreased knowledge and understandings of health instructions and discharge teaching. Contrarily, highly-educated people acquire better cognitive skills in processing and remembering information provided during educational interventions, which leads to adherence with health advice and changed health-related behaviors.[20] They are likely to have greater access to discretionary procedures, have lower pain and have better function after orthopedic surgery.[10] Therefore, higher educational status contributes to higher physical function.

People with psychological distress undergoing orthopedic surgery are at risk of less functional improvement because of lack of motivation and trouble sticking to full engagement in rehabilitation or discharge teaching programs.[5,9,21] They have an increased level of inflammatory mediators and proinflammatory cytokines, leading to a decreased pain threshold and increased postoperative pain.[22] They mention the entire care receiving experience in a more negative light and have decreased satisfaction with care.[23] Also, psychological distress contributes to other health conditions which might trigger anxiety and negative thinking that prevents people from participating in physical activities.[21] Therefore, psychological distress controls POFA.

Regarding organizational characteristics, hospital setting, various characteristics of hospital settings have been documented as influencing care processes and outcomes. Larger hospitals may have issues such as not providing help to patients on time, and getting less satisfaction with care.[24] The more specialized the hospital, the more specific category of patients is focused and the more predominant use of evidence-based procedures.[25] Likewise, resources of care delivery in a hospital setting can promote health care outcomes. People receiving care in hospitals with high nurse-to-patient ratio experience better nursing care including adequate discharge teaching and satisfied with care.[26] All these facts together highlight that the hospital setting is an important organizational characteristic expected to influence the care process and outcomes of people undergoing surgery for LEF.

In terms of process of care, discharge teaching can improve the functional ability of people undergoing orthopedic surgery, and their improved health knowledge, high compliance and decreasing long-term health care utilization. Also, discharge teaching helps people to identify problems early, promote self-care, increase the chances for intervention, and improve outcomes. Patients who are well-informed by discharge teaching trust the healthcare system and are more satisfied with the care provided.[12,27] In orthopedics, nurse-led, patient-oriented discharge education emphasizes biophysiological and functional needs.[28] Therefore, discharge teaching contributes to the improvement of POFA of the people undergoing orthopedic surgery.

In relation to an immediate outcome, pain with activity, higher pain is associated with lower physical functioning.[13] Due to postoperative pain, people undergoing orthopedic surgery experience pain-related distress such as frustration, anger, and depression. Such pain reduces early ambulation and activities, interrupts sleeping, induces lethargy and fatigue, and a lack of cooperation with treatment and a delay in the initiation of walking during postoperative rehabilitation.[29] Thus, pain controls POFA. Another immediate outcome, satisfaction with care, confers clinical benefits and is associated with higher physical functioning. People who are satisfied with care are more likely to adhere to treatment regimens and advice from health care providers and to continue to use medical care services and improve health outcomes.[14] Therefore, satisfaction with care contributes POFA in orthopedics. Based on empirical evidence consistent with the Donabedian model, and because of a lack of research on the topic in Myanmar, this study was undertaken to fulfill the following aim.

Study Aim: To identify predictability of patient characteristics (educational status, psychological distress), organizational characteristics (hospital setting), process of care (quality of discharge teaching), and immediate outcomes (pain with activity, satisfaction with care) on POFA of working-age adults with simple LEF in three orthopedic care settings in Myanmar

Methods

Design: A predictive correlational study.

Sample and Setting: This study consecutively enrolled people with LEF scheduled for surgery at three orthopedic care settings in Myanmar. Inclusion criteria were: aged between 18 and 59 years, having unilateral, isolated LEF (femur or tibia, or both tibia and fibula), first experience of LEF and undergone one-step surgical fixation, able to perform ADL independently before injury, and able to communicate with Myanmar language. Exclusion criteria were those: with history of psychological illness before the injury, pregnant, having LEF with intra-articular involvement, multiple trauma or head injury or spinal cord injury, and severe medical conditions that affect functional ability (myocardial infarction, tuberculosis, AIDS, and arthritis). Sample size was calculated by using the G*Power program. To determine a suitable sample size for multiple regression analysis, an effect size of .10, a power of .80, an alpha of .05, and 6 predictors were used. The minimum sample needed was 143 individuals. Being a prospective correlational study, a dropout rate of 25% was added, so the required samples were 178 individuals.

In Myanmar, the selected settings were Hospital A (2000-bed general hospital), Hospital B (500-bed orthopedic hospital), and Hospital C (300-bed orthopedic hospital) which were major orthopedic referral centers with well-equipped theaters staffed by senior and expert orthopedic surgeons and nurses. Hospital A and C were located in Yangon, and B in Mandalay.

Ethical Considerations: After obtaining approval from the Ethical Committee, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok, Thailand (ID 11-60-84), and the Ethics Review Committee, Department of Medical Research, Ministry of Health and Sports, Myanmar (Ethics/DMR/2018/005), the principal investigator (PI) and well-trained research assistants (RAs) approached potential participants. Study objectives and procedures and the right to refuse to participate or withdraw at any time without detriment to the care and treatment were informed to the participants. No harmful or life-threatening risks to the participants were identified. All the participants' identities were kept confidential. A consent form was distributed to each participant and written agreement was obtained before administering the questionnaires.

Instruments: Six instruments were used. The PI sought permission from the owners of five instruments, and the original English version of these were translated into Myanmar by using the WHO instrument translation and adaptation process[30] and expert panels. Cognitive interviewing, validity, and reliability were acceptable prior to administer in this study.

Patient Data Record Form (PDRF): This was designed to assess participants' personal characteristics and included 14 items: hospital name, age, gender, height, weight, marital status, completed year of formal education, income per month, occupation, type of injury, fracture location, type of fracture, type of surgery, and length of hospital stay (LOS).

Impact of Event Scale- Revised (IES-R): This was developed by Weiss and Marmar[31] and measures psychological distress. It includes 22 items (e.g., I tried not to mention about that event) with three subscales: avoidance, intrusion, and hyperarousal. Each item is rated on 5-point scale to measure symptom severity (0 = not at all, 1 = a little bit, 2 = moderately, 3 = quite a bit and 4 = extremely). The IES-R provides an overall raw score range 0 to 88. The lower the scores, the lower difficulties the patient faces by psychological distress posed by the event. A previous study determined a Cronbach's α of .95.[32] In this study, the content validity (CVI) of the scale was .90, and the Cronbach's α was .85.

Quality of Discharge Teaching Scale (QDTS): The scale developed by Weiss et al.[33] and used for assessing quality of discharge teaching. It includes 24 items (e.g., 'Did nurses help you to feel confidence in your ability in caring yourself at home?') with a 0-10 point response format, "0" = none or not at all and "10" = always or a great deal. The three subscales are content need (6 items), content received (6 items), and the delivery subscale (12 items). The total score range is 0-180; only the scores of content received and delivery subscales were calculated. A higher total score indicates more information is transferred for patients' discharge by nurses. The scale was first tested among adult medical and surgical patients, and the Cronbach's α was .92. In this study, the CVI was .87 and the Cronbach's α was .84.

Numeric Rating Scale-Pain (NRS-P): The NRS-P was used for assessing patients' pain with activity. The scoring system comprises a horizontal line divided into 11 segments (0-10); '0' indicates no pain and '10' represents the worst pain imaginable that the patient had. The score ranges from 0 to 10. The higher the score, the more pain the patients suffer. The scale demonstrated a high test-retest reliability of .96 among patients who were literate and .94 among those who were illiterate.[34] In this study, the CVI was 1.0. Test-retest reliability on 30 pilot samples was .97.

Patient Satisfaction with Nursing Care Quality Questionnaire (PSNCQQ): This was developed by Laschinger et al.[35] and is used for assessing patient satisfaction with nursing care. The questionnaire includes 19 items (e.g., 'Easily accessible information': 'Nurses' willingness to answer your questions'). It has a 5-point Likert-type scale with description of magnitude: 1= poor, 2 = satisfactory, 3 = good, 4 = very good and 5 = excellent. Total score range is 19-95. The higher the score, the more satisfied patients are. Cronbach's α firstly tested among medical surgical patients was .97. In this study, the CVI was .98 and the Cronbach's α was .90.

Lower Extremity Measure (LEM): The LEM developed by Jaglal et al.[36] was used for assessing patients' functional ability 6 weeks after surgery. It consists of 29 items (e.g., 'Walking up and down the slopes'). Each activity is graded from 1 (impossible), 2 (extremely difficult) to 5 (not at all difficult), including a "not applicable" option. The summary score is calculated by the formula, [(total raw score - lowest possible total raw score) /raw score range] * 100. The higher the score, the higher the level of POFA. Cronbach's α was .94 when LEM was first tested on patients with hip fractures. In this study, the CVI was .92 and Cronbach's α was .92.

Data Collection: To avoid invalid information due to participant writing issues, an interview method and data extraction from medical record were employed for data collection. An interview was conducted when the person with LEF consenting (PDRF and IES-R), then at discharge (QDTS, NRS-P, and PSNCQQ) in trauma and orthopedic wards and six weeks after surgery (LEM) at outpatient departments of the selected settings. Functional ability was assessed at six weeks postoperatively because LEF healing might occur within six to 20 weeks; according to the Arbeitsgemeinschaft für Osteosynthesefragen (Association for the study of internal fixation) the AO principle, partial and full weight-bearing for people undergone operative fixation of LEF are allowed within 3-10 weeks (especially, femur or tibia shaft fractures).[37] By assessing POFA of people with LEF at six weeks, health care providers could identify the magnitude of the functional limitation and adjust rehabilitation services early.

Data Analysis: Data were analyzed by using SPSS for Windows version 18 (Software License

Download @ Mahidol). Descriptive analysis was performed for all study variables. A Kolmogorov-Smirnov test was performed to test normal distribution of study variables, and found that only two variables, quality of discharge teaching and satisfaction with care were normally distributed. Thus, Spearman's correlation was employed to examine the strength and associated direction between the study variables. Assumptions of normality, linearity, multicollinearity, and autocorrelation were tested for regression analysis. Based on the guided theoretical framework, hierarchical regression analysis was used to examine predictability of the set of variables on POFA.

Among six independent variables, the hospital setting was coded into dummy variables to represent three groups of people with simple LEF from the three hospitals in a single regression equation, and to be meaningfully interpreted its prediction on POFA. Hospital C was set as reference category because the lowest number of people with acute traumatic LEF was admitted there and it mainly focused on people with cold and degenerative orthopedic conditions.

Hospital_A = 1 if admitted to Hospital A, 0 otherwise

Hospital_B = 1 if admitted to Hospital B, 0 otherwise

Results

Characteristics of the Participants

A total of 178 adults with simple LEF (67 from Hospital A, 48 from Hospital B, and 63 from Hospital C) was the final sample. The mean age of the participants was 33.24 years (SD =12.63 years). Majority (85.4%) were male, 53.9% were married, and 86.0% possessed normal body mass index (BMI = 18.5-24.9 kg/m^2). Workers, laborers, and farmers were 20.2%, 20.2% and 20.8 %, respectively; and 55.6% earned 200,000 - 300,000 Kyats (USD140-$210) per month. The injury of 65.2% of the participants was caused by a motorcycle accident. Most experienced both tibia and fibula fractures (60.7%) and a closed fracture (51.1%), 88.8% were surgically treated with intramedullary nails, and 40% of them had a length of hospital stay (LOS) of 14 - 21 days. (**Table 1**).

Table 1 Demographic and Clinical Characteristics of Study Participants (N = 178)

	Hospital A (N = 67)		**Hospital B (N = 48)**		**Hospital C (N = 63)**		**Total (N = 178)**	
	n	**(%)**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
Age (Years)								
18-29	32	(17.9)	22	(12.4)	29	(16.3)	83	(46.6)
30-45	24	(13.5)	13	(7.3)	22	(12.4)	59	(33.2)
46-59	11	(6.2)	13	(7.3)	12	(6.7)	36	(20.2)
Mean	32.91		34.63		32.56		33.24	
SD	11.31		13.98		13.00		12.63	
Gender								
Male	58	(32.6)	39	(21.9)	55	(30.9)	152	(85.4)
Female	9	(5.1)	9	(5.1)	8	(4.4)	26	(14.6)
BMI*								
< 18.5	13	(7.3)	2	(1.1)	4	(2.2)	19	(10.7)
18.5 to 24.9	54	(30.3)	44	(24.7)	55	(30.9)	153	(86.0)
25 to 29.9	0	(0.0)	2	(1.1)	4	(2.2)	6	(3.3)
Marital Status								
Single	31	(17.4)	15	(8.4)	35	(19.7)	81	(45.5)
Married	35	(19.7)	33	(18.5)	28	(15.7)	96	(53.9)
Divorced	1	(0.6)	0	(0.0)	0	(0.0)	1	(0.6)

Table 1 Demographic and Clinical Characteristics of Study Participants (N = 178) (Cont.)

	Hospital A (N = 67)		Hospital B (N = 48)		Hospital C (N = 63)		Total (N = 178)	
	n	(%)	n	(%)	n	(%)	n	(%)
Number of Years in School								
Illiterate (0 year)	1	(0.6)	0	(0.0)	2	(1.1)	3	(1.7)
Primary School (1–5 years)	18	(10.1)	10	(5.6)	15	(8.4)	43	(24.1)
Middle School (6 – 9 years)	25	(14.0)	16	(9.0)	19	(10.7)	60	(33.7)
High School (10 – 11 years)	14	(7.9)	17	(9.6)	16	(9.0)	47	(26.5)
University student (12 – 14 years)	2	(1.1)	2	(1.1)	5	(2.8)	9	(5.0)
Graduate (15 years)	7	(3.9)	3	(1.7)	6	(3.4)	16	(9.0)
Income (kyats per month with USD equivalents)								
No income	8	(4.5)	10	(5.6)	15	(8.4)	33	(18.5)
< 100,000 (< $70)	4	(2.3)	1	(0.6)	2	(1.1)	7	(4.0)
100,000 to < 200,000 ($70 to < $140)	11	(6.2)	12	(6.7)	10	(5.6)	33	(18.5)
200,000 –300,000 ($140 –$210)	39	(21.9)	25	(14.0)	35	(19.7)	99	(55.6)
> 300,000 (> $210)	5	(2.8)	0	(0.0)	1	(0.6)	6	(3.4)
Occupation								
Professional	5	(2.8)	1	(0.6)	4	(2.2)	10	(5.6)
Clerk	3	(1.7)	3	(1.7)	2	(1.1)	8	(4.5)
Craftwork	2	(1.1)	2	(1.1)	4	(2.2)	8	(4.5)
Salespersons	8	(4.5)	0	(0.0)	2	(1.1)	10	(5.6)
Worker	17	(9.5)	6	(3.4)	13	(7.3)	36	(20.2)
Laborer	11	(6.1)	14	(7.9)	11	(6.2)	36	(20.2)
Farmer	13	(7.3)	12	(6.7)	12	(6.7)	37	(20.8)
Unemployed	5	(2.8)	2	(1.1)	1	(0.6)	8	(4.5)
Others	3	(1.7)	8	(4.5)	14	(7.9)	25	(14.1)
Type of Injury								
Motorcycle accident	43	(24.1)	26	(14.6)	47	(26.5)	116	(65.2)
Car accident	9	(5.1)	12	(6.7)	8	(4.5)	29	(16.3)
Fall from height	2	(1.1)	4	(2.2)	5	(2.8)	11	(6.2)
Sports	3	(1.6)	0	(0.0)	1	(0.6)	4	(2.2)
Other	10	(5.6)	6	(3.4)	2	(1.1)	18	(10.1)
Fracture Location								
Femur	24	(13.5)	8	(4.5)	24	(13.5)	56	(31.5)
Tibia	6	(3.4)	4	(2.2)	4	(2.2)	14	(7.8)
Both tibia and fibula	37	(20.8)	36	(20.2)	35	(19.7)	108	(60.7)
Type of Fracture								
Closed	37	(20.7)	22	(12.4)	32	(18.0)	91	(51.1)
Gustilo Type I	24	(13.5)	23	(12.9)	30	(16.9)	77	(43.3)
Gustilo Type II	6	(3.3)	3	(1.7)	1	(0.6)	10	(5.6)
Type of Surgery								
Locking nail	56	(31.5)	45	(25.3)	57	(32.0)	158	(88.8)
Locking plate	11	(6.1)	3	(1.7)	6	(3.4)	20	(11.2)

Table 1 Demographic and Clinical Characteristics of Study Participants (N = 178) (Cont.)

	Hospital A (N = 67)		Hospital B (N = 48)		Hospital C (N = 63)		Total (N = 178)	
	n	(%)	n	(%)	n	(%)	n	(%)
Length of Hospital Stay (days)								
≤ 7	5	(2.8)	3	(1.7)	10	(5.6)	18	(10.1)
> 7 – 14	16	(9.0)	29	(16.0)	16	(9.0)	61	(34.3)
> 14 – 21	28	(15.7)	13	(7.3)	29	(16.3)	70	(39.3)
> 21 – 30	14	(7.9)	3	(1.7)	7	(3.9)	24	(13.5)
> 30 days	4	(2.2)	0	(0.0)	1	(0.6)	5	(2.8)

Note:* BMI = body mass index based on international category

Study Variables

More than half of the participants had secondary school level educational status. Concerning pain with activity, it was at a mild level. When the mean scores of psychological distress, quality of discharge teaching, satisfaction with care, and POFA were compared with the midpoints of the maximum possible score, the psychological distress displayed a low level, while quality of discharge teaching, satisfaction with care, and POFA were found as a moderate level (**Table 2**).

Table 2 Descriptive statistics of study variables (N=178)

Variables	Possible range	Actual range	Mean	SD
Education Status (Number of years in school)	0-20	0-15	8.35	3.43
Psychological Distress	0-88	0-28	9.88	8.52
Avoidance	0-32	0-15	3.18	3.20
Intrusion	0-32	0-12	4.01	3.63
Hyperarousal	0-24	0-12	2.69	2.88
Quality of Discharge Teaching	0-180	22-175	98.45	22.28
Content need	0-60	45-60	54.53	3.73
Content received	0-60	0-60	29.98	10.70
Delivery	0-120	18-117	68.47	17.00
Pain with Activity	0-10	0-5	1.23	1.44
Median = 0				
Satisfaction with Care	19-95	19-80	54.46	9.26
Postoperative Functional Ability	0-100	32-76	58.25	10.01

Predictors of POFA

Table 3 displays a correlation matrix among study variables. Overall, a multicollinearity correlation was not problematic. However, psychological distress and pain with activity had a negative correlation with POFA ($r = -.330$, $p < .01$; $r = -.153$, $p < .05$, respectively). A contrast correlation was found between hospital setting and POFA and between quality of discharge teaching and POFA ($r = .518$, $p < .01$; $r = .263$, $p < .01$, respectively). In the regression model, the structure of care variable, patient characteristics (educational status and psychological distress) were entered into the model first, followed by organizational characteristics (hospital setting), then the process of care variable (quality of discharge teaching), and finally, the immediate outcome variables (pain with activity and satisfaction with care) were entered. All four models were significant although the final model demonstrated insignificant $F_{change\,(2,170)} = 2.66$ (p = .073). In the first model, psychological distress was a significant predictor and the first model explained 13.1% of variance in POFA. After controlling patient characteristics, the hospital setting was a significant predictor and explained additional 23% of variance in POFA in the second model. After controlling patient characteristics and organizational characteristics in the third model, quality of discharge teaching was a significant predictor, and explained an additional 1.4% of the variance in POFA. In the final model, all predictors explained 39.4% of the variance in POFA. After controlling for patient characteristics, organizational characteristics, and the process of care variables, pain with activity was a significant predictor, and this explained and extra 1.9% of the variance in POFA. Although the model showed insignificant F_{change}, pain with activity was accepted as a vital factor influencing patients' ability to perform activity, the final model was included in this study. However, educational status and satisfaction with care were insignificant predictors in the models.

Table 3 Correlation between study variables

Variables	1	2	3	4	5	6	7	8
1 Education Status	1.000							
2 Psychological Distress	-.083	1.000						
3 Hospital A	-.104	.162*	1.000					
4 Hospital B	.061	-.435**	-.472**	1.000				
5 Quality of Discharge Teaching	-.072	-.027	-.181*	.302**	1.000			
6 Pain (with Activity)	-.237**	.240**	.242**	-.219**	.030	1.000		
7 Satisfaction with Care	-.031	.045	-.223**	.322**	.496**	-.009	1.000	
8 Postoperative Functional Ability	.004	-.330**	.039	.518**	.263**	-.153*	.137	1.000

**Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

Table 4 Results of Hierarchical Regression Analysis of factors predicting postoperative functional ability (N = 178)

Model	Predictors	b	S.E. (b)	Beta	t	Sig
1	(Constant)	61.714	2.054		30.053	.000
	Education Status	.086	.205	.029	.417	.677
	Psychological Distress	-.423	.083	-.360	-5.109	.000
R = .363, R^2 = .131, R^2 Adjust = .122, Overall $F_{(2.175)}$ = 13.243, p = .000						
2	(Constant)	52.878	2.113		25.028	.000
	Education Status	.123	.178	.042	.690	.491
	Psychological Distress	-.194	.079	-.165	-2.462	.015
	Hospital A	7.292	1.430	.354	5.100	.000
	Hospital B	13.048	1.695	.580	7.697	.000
R = .601, R^2 = .361, R^2 Adjust = .346, R^2 change = .230, Overall $F_{(4.173)}$ = 24.452, p = .000						
3	(Constant)	47.345	3.494		13.550	.000
	Education Status	.164	.178	.056	.926	.356
	Psychological Distress	-.209	.078	-.178	-2.661	.009

Table 4 Results of Hierarchical Regression Analysis of factors predicting postoperative functional ability (N = 178) (Cont.)

Model	Predictors	b	S.E. (b)	Beta	t	Sig
	Hospital A	7.404	1.419	.359	5.218	.000
	Hospital B	12.371	1.716	.550	7.211	.000
	Quality of discharge teaching	.056	.028	.124	1.979	.049
R = .613, R^2 = .375, R^2 Adjust = .357, R^2 change = .014, Overall $F_{(5.172)}$ = 20.674, p = .000						
4	(Constant)	50.459	4.415		11.430	.000
	Education Status	.082	.180	.028	.457	.649
	Psychological Distress	-.167	.080	-.142	-2.075	.039
	Hospital A	7.868	1.426	.382	5.517	.000
	Hospital B	12.508	1.759	.556	7.111	.000
	Quality of discharge teaching	.072	.031	.161	2.358	.020
	Satisfaction with care	-.064	.076	-.059	-.842	.401
R = .628, R^2 = .394, R^2 Adjust = .369, R^2 change = .019, Overall $F_{(7.170)}$ = 15.813, p = .000						

Note: Significance at the .05 level.

Discussion

Results from this study demonstrated the predictive power of the care structure (patient characteristics: educational status and psychological distress, and organizational characteristics: hospital setting), care process (quality of discharge teaching), and immediate outcomes (pain with activity and satisfaction with care) on POFA.

In the first model of regression, only psychological distress showed significant predictability on POFA, while educational status was insignificant. This result is partially supported by previous studies which indicate that psychological distress due to a traumatic event is a negative predictor of both short-term and long-term functional outcomes[5] and educational status as a positive predictor of POFA.[10] Prediction of psychological distress on POFA may be because psychological distress causes fear of re-injury and avoidance of activities. It also causes negative moods in people that may disturb their functioning. Any form of psychological distress, low or high, reduces a person's motivation to engage in rehabilitation activities fully.[21] These might have led to psychological distress influencing the POFA of people with simple LEF in this study. However, the discrepancy of insignificant correlation and prediction of educational status on POFA might be because this study had different participant characteristics and time of assessment of functional ability to previous studies. In previous studies, most of the participants were at least high school level-educated,[10] suffered severe lower extremity injury, and functional ability was assessed at a year or more after injury. In this study, the participants suffered only simple LEF, and functional ability was assessed at six weeks postoperatively. After the treatment, patients with LEF needed continuing care for short-term and long-term recovery. For short-term recovery, numerous opportunities and holistic approaches were provided for people with LEF, including educational resources,[21] while the long-term care required a period of time for recovery, which was enhanced by connecting to long-term rehabilitation services, support groups, and social support networking. In this study, most of participants had a low educational level; they might be less likely to access the long-term services attributable to low intellectual reasoning and socioeconomic status. Thus, educational status might have insignificance correlation and prediction to POFA.

After adding hospital settings into the second model, Hospital A and Hospital B were found to be significant predictors of POFA. The people with simple LEF in Hospital A and Hospital B had POFA higher than people in Hospital C. Among the three hospital settings, Hospital B showed the most robust prediction in POFA. The explanation of the different POFA of the patients discharged from different hospital settings was that hospital specialization and hospital volume were important hospital characteristics contributing to POFA. General hospitals attended a wide variety of health conditions while specialty hospitals targeted a specific service and high-quality care performance[11,38] that might have been due to the specialist nature of orthopedic care team. Additionally, a previous study reported that the larger the hospital, the slower the response to patients' health care needs which largely affected patient satisfaction and functional ability.[24] Another reason might be nursing staffing in the hospital. Inadequate staffing was associated with omitting essential care and adverse patient outcomes.[26] In Hospital A, being the biggest general hospital and due to the availability of 24-hour emergency service, the number of people with acute traumatic orthopedic problems was approximately double the number of the sanctioned beds in the two trauma and orthopedic wards. The beds were always full and chairs or tables were pushed together to create additional space for patients. Therefore, nurse-to-patient ratios were low in Hospital A on most days. Hospital C was an orthopedic specialist hospital dealing with cold orthopedic cases such as degenerative conditions, tumors, and infections cases; however, when the theatre waiting list of traumatic fracture patients in Hospital A was long, some of them were referred to Hospital C. Therefore, nurse-to-patient ratios in wards people with LEF admitted became low. In Hospital A and C, nurses had lengthy experience in orthopedic care, and the number of nurses who accomplished orthopedic specialty nursing training were high. However, they were actually nurses in charge of the ward and occupied with ward management. Direct patient care was mostly carried out by trained nurses who had little experience and not attain orthopedic specialty training. This might have affected the quality of discharge teaching and patient outcomes. These researcher observations might be the cause of the lower POFA score of the participants in Hospital A and C than that of Hospital B.

The Hospital B was the most robust predictor among the three hospital settings. It may be because the Hospital B exercised a close collaboration between orthopedic surgeons and nurses in the daily management of patients. Positive collaboration between nurses and physicians is essential in clinical practice because it has a significant relationship with the quality, safety, accountability, and responsibility of care. Sharing education and teamwork, working, and learning together are the key factors that both professions comprehend;[39] therefore, nurses in Hospital B might have enthusiasm in close collaboration among themselves and with the existing orthopedic group, the Myanmar Orthopedic Society. Also, both professions appeared to be practicing clinical collaboration. Because of high professional collaboration in Hospital B, patient care might be more streamlined, and outcomes including POFA might also be better. Moreover, nurses in Hospital B might be motivated strongly by research activities. Fortunately, nurses in each ward of Hospital B got a precious opportunity to start practicing departmental research while nurses in other hospitals had fewer chances of conducting research. Therefore, patient care in Hospital B might have been more evidence-based and people with LEF might have the better POFA. In summary, focusing specialized orthopedic care, high case volume of people with LEF, practicing close collaboration between nurses and orthopedists in patient care, more streamline in care provision, conducting research and provision of evidence-based care were the factors that led Hospital B to be superior to the Hospital A and C in prediction of POFA of people with simple LEF.

After being added into the third model, the quality of discharge teaching was found to be a significant predictor of POFA. Consistent findings from previous international studies reported that discharge teaching in orthopedics improved POFA.[40] The reason for this finding may be that the people undergoing orthopedic surgery received discharge information from the nurses and/or other healthcare providers with/without instruction; patients had better understanding in performing rehabilitation exercises and daily activities which lead to positive results in reinstating physical function. As a consequence, patient outcomes including POFA were improved.

Regarding immediate outcomes, after controlling patient characteristics, structural characteristics, and process of care, pain with activity was a significant predictor of POFA; however, satisfaction with care was insignificant. The findings partially supported that of previous studies which presented pain with activities and satisfaction with care as predictors of POFA. Similar findings were presented in previous international studies which found that pain affected the ability to perform activities of daily living of patients at early postoperative days for up to 6 weeks.[13] When people with LEF experience pain while performing lower extremity function, they intentionally restrict activities. As a result, early rehabilitation might be hindered and functional ability improvement might also be slower. In this study, although most of the participants' pain with activity was only mild, people with simple LEF who experienced more pain at discharge presented the low perceived POFA. Therefore, this finding supported the idea that pain consistently predicted functional ability.

Satisfaction with care was a predictor of positive health outcomes among people undergoing orthopedic surgery and other patient populations.[14] The inconsistent finding of this study might be due to differences in characteristics of samples, instruments, and meaning of satisfaction of care compared to previous studies. Another reason was that satisfaction with care was significantly correlated with the quality of discharge teaching; therefore, when quality of discharge teaching was entered into the model first, it left less space for the satisfaction with care to explain the variance in POFA.

The findings of this study support the Donabedian model in that good structure should lead to good process, and in turn good outcomes, and incorporating patient characteristics gave more understanding of the linkage between process and outcome.[17,19] This study added the findings that immediate outcomes significantly correlated and predicted the targeted outcome, POFA.

Limitations

The limitations of this study include:1) Generalizability of the results is limited because of using purposive sampling with a set of criteria for selecting participants; 2) Social desirability bias might go to the participant's self-presentation of the quality of discharge teaching, satisfaction with care, and the POFA because of using self-report questionnaires; 3) Hospital setting was the only organizational variable included in this study; other issues, such as the nurse practice environment, or supportive facility system, were not focused in detail; and 4) Causal linkages between domains of the Donabedian model were not tested.

Conclusion and Implication for Nursing Practice

Based on the Donabedian model, psychological distress in patient characteristics variables, hospital setting of organizational characteristics variable, quality of discharge teaching in process of care variable and pain with activity in outcome variables were significantly correlated and predicted POFA of people with simple LEF six weeks after surgery. Correlation between patient characteristics and organizational characteristics to the process of care and correlation between process of care and immediate outcomes were also identified. The findings highlighted that psychosocial distress due to traumatic event is as important as physical injury among people with simple LEF, and it is vital to facilitate an appropriate rehabilitation program plan for the patients in the context of nursing care with multidisciplinary care team. Therefore, nurses need to assess patients' psychological distress and provide appropriate psychological intervention as early as possible. Although hospital settings and quality of discharge teaching influenced POFA, reorganization of the hospital and clinical services in the settings may be difficult. However, enlarging human resources by increasing the number of well-prepared nurses is necessary to provide better care. Thus, nurses in orthopedic hospitals should try their best to become specialized and better educated. At this point, achievement of orthopedic nursing specialty training is an important matter in Myanmar, where nurses need to pay more attention to quality discharge teaching by putting a value on patient teaching, coherence in discharge teaching, appropriate communication skills, emphasizing patient's right, supervision and control over discharge teaching, and motivation and rewarding system in the organization. Additionally, nurses need training regarding evaluating postoperative pain and the prescription of the analgesia for people undergone orthopedic surgeries.

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References

1. Haagsma JA, Graetz N, Bolliger I, et al. The global burden of injury: incidence, mortality, disability-adjusted life years and time trends from the Global Burden of Disease study 2013. Injury Prevention. 2016; 22(1): 3-18.
2. Ministry of Health and Sport. Public Health Statistics Report 2014-2016. Nay Pyi Taw: Department of Public Health. 2017. 93p.
3. Department of Public Health & Department of Medical Services. Annual hospital statistics report 2013. Ministry of Health, Myanmar. Nay Pyi Taw.2015.175p.
4. Sluys KP, Shults J, Richmond TS. Health related quality of life and return to work after minor extremity injuries: a longitudinal study comparing upper versus lower extremity injuries. Injury. 2016; 47(4): 824-831.
5. Kellezi B, Coupland C, Morriss R, et al. The impact of psychological factors on recovery from injury: a multicentre cohort study. Soc Psychiatry Psychiatr Epidemiol. 2017; 52(7):855-66.
6. O'Hara NN, Mugarura R, Potter J, et al. Economic loss due to traumatic injury in Uganda: the patient's perspective. Injury. 2016; 47(5):1098-1103.
7. Clelland SJ, Chauhan P, Mandari FN. The epidemiology and management of tibia and fibula fractures at Kilimanjaro Christian Medical Centre (KCMC) in Northern Tanzania. Pan Afr Med J. 2016; 25: 51. doi: 10.11604/pamj.2016.25.51.10612.
8. Associates in Physical Medicine and Rehabilitation. (n.d.). Rehabilitation helps stroke patients recover skills. Retrieved 22 September 2017, from http://www.apmandr.com/resources/rehabilitation-helps-stroke-patients-recover-skills-2/
9. Ayers DC, Franklin PD, Ring DC. The role of emotional health in functional outcomes after orthopedic surgery: extending the biopsychosocial model to orthopaedics: AOA critical issues. J Bone Joint Surg Am. 2013; 95(21). doi: 10.2106/JBJS.L.00799.
10. Feldman CH, Dong Y, Katz JN, Donnell-Fink LA, Losina E. Association between socioeconomic status and pain, function and pain catastrophizing at presentation for total knee arthroplasty. BMC Musculoskelet Disord. 2015; 16:18. doi: 10.1186/s12891-015-0475-8.
11. American Academy of Orthopedic Surgeons. Position statement. Specialty Hospital [Internet]. Aaos.org. 2016 [cited 11 November 2018]. Available from: https://www.aaos.org/uploadedFiles/ PreProduction/About/Opinion_Statements/position/1167SpecialtyHospitals.pdf

12. Mayich DJ, Tieszer C, Lawendy A, McCormick W, Sanders D. Role of patient information handouts following operative treatment of ankle fractures: a prospective randomized study. Foot Ankle Int. 2013; 34(1): 2-7. doi: 10.1177/1071100712460229.
13. Hida M, Deguchi Y, Miyaguchi K, et al. Association between acute postoperative pain and recovery of independent walking ability after surgical treatment of hip fracture. Progress in Rehabilitation Medicine. 2018;(3):1-7. doi: https://doi.org/10.2490/prm.20180012.
14. Baumann C, Rat AC, Mainard D, Cuny C, Guillemin F. Importance of patient satisfaction with care in predicting osteoarthritis-specific health-related quality of life one year after total joint arthroplasty. Qual Life Res. 2011; 20(10):1581-8. doi: 10.1007/s11136-011-9913-8.
15. Donabedian A. Evaluating the quality of medical care. Milbank Mem Fund Q. 1966; 44(3):166-206.
16. Donabedian A. The quality of care: how can it be assessed?. JAMA. 1988; 260(12):1743-1748.
17. Moore L, Lavoie A, Bourgeois G, Lapointe J. Donabedian′s structure-process-outcome quality of care model: validation in an integrated trauma system. J Trauma Acute Care Surg. 2015;78(6):1168-1175. doi: 10.1097/TA.0000000000000663.
18. Aree-Ue S, Roopsawang I, Kawinwonggowit V. Factors predicting functional ability among older adults undergoing hip and knee arthroplasty. Pacific Rim Int J of Nurs Res. 2019; 23(2):156-159.
19. Bosse G, Mtatifikolo F, Abels W, Strosing C, Breuer JP, Spies C. Immediate outcome indicators in perioperative care: a controlled intervention study on quality improvement in hospitals in Tanzania. PloS One. 2013;8(6):e65428. doi:10.1371/journal.pone.0065428.
20. Zimmerman EB, Woolf SH, Haley A. Understanding the relationship between education and health. In RM Kaplan, ML Spittel, DH David, editors. Population health: behavioral and social science insights. Rockville: the Agency for Healthcare Research and Quality Publication; 2015. p 347-384.
21. Vincent HK, Horodyski M, Vincent KR, Brisbane ST, Sadasivan KK. Psychological distress after orthopedic trauma: prevalence in patients and implications for rehabilitation. PM&R. 2015;7(9):978-89. doi: 10.1016/j.pmrj.2015.03.007.
22. Goebel S, Steinert A, Vierheilig C, Faller H. Correlation between depressive symptoms and perioperative pain: a prospective cohort study of patients undergoing orthopedic surgeries. Clin J Pain. 2013;29(5):392-399. doi: 10.1097/AJP.0b013e318262e2c8.
23. Abtahi AM, Brodke DS, Lawrence BD, Zhang C, Spiker WR. Association between patient-reported measures of psychological distress and patient satisfaction scores in a spine surgery patient population. J Bone Joint Surg Am. 2015;97(10):824-828. doi: 10.2106/JBJS.N.00916.
24. McFarland DC, Shen MJ, Parker P, Meyerson S, Holcombe RF. Does hospital size affect patient satisfaction? Qual Manag Health Care. 2017;26(4):205-209. doi: 10.1097/QMH.0000000000000149.
25. Eastaugh SR. Hospital specialization: benefits-focused product line planning. J Health Care Finance. 2015; 41(3).1-15.
26. American Nurses Association. Optimal nurse staffing to improve quality of care and patient outcomes: Executive summary. [place unknown]: Avalere Health LLC; 2015. 45p.
27. Murdock A, Griffin B. How is patient education linked to patient satisfaction? Nursing2018. 2013;43(6):43-45. doi: 10.1097/01.NURSE.0000427101.75399.fe.
28. Charalambous A, Papastavrou E, Valkeapää K, et al. content of orthopedic patient education provided by nurses in seven european countries. CNR. 2017; 27(7):770-789. doi: 10.1177/1054773817713178.
29. Barbosa MH, Araújo NF, Silva JA, Corrêa TB, Moreira TM, Andrade ÉV. Pain assessment intensity and pain relief in patients post-operative orthopedic surgery. Escola Anna Nery. 2014;18(1):143-147. doi: 10.1177/1054773817713178.
30. WHO. Process of translation and adaptation of instruments. nd; http://www.who.int/substance_abuse/research_tools/translation/en/. Accessed 7 March, 2017.
31. Weiss DS, Marmar CR. The Impact of Event Scale-Revised. In JP Wilson & TM Keane (Eds.), Assessing psychological trauma and PTSD. New York: The Guilford Press. 1997. p. 399-411.
32. Creamer M, Bell R, Failla S. Psychometric properties of the impact of event scale-revised. Behav Res Ther. 2003; 41(12):1489-96.

33. Weiss ME, Piacentine LB, Lokken L, et al. Perceived readiness for hospital discharge in adult medical-surgical patients. Clin Nurs Spec. 2007;21(1):31-42.
34. Ferraz MB, Quaresma MR, Aquino LR, Atra E, Tugwell P, Goldsmith CH. Reliability of pain scales in the assessment of literate and illiterate patients with rheumatoid arthritis. J Rheumatol. 1990;17(8):1022-1024.
35. Laschinger HS, Hall LM, Pedersen C, Almost J. A psychometric analysis of the patient satisfaction with nursing care quality questionnaire: an actionable approach to measuring patient satisfaction. J Nurs Care Qual. 2005;20(3):220-30.
36. Jaglal S, Lakhani Z, Schatzker J. Reliability, validity, and responsiveness of the lower extremity measure for patients with a hip fracture. J Bone Joint Surg Am. 2000;82(7):955-62.
37. Ryf CR, Arraf J. Postoperative fracture treatment: general considerations. In TP Ruedi, RE Buckley, CG Moran, editors. AO principles of fracture management. 2nd ed. Davos: AO Publishing; 2007.447p.
38. Singh JA, Ramachandran R. Does hospital volume predict outcomes and complications after total shoulder arthroplasty in the US? Arthritis Care & Res. 2015;67(6):885-90. doi: 10.1002/acr.22507.
39. Plummer V, Copnell B. Collaboration between nurses and physicians in an Indonesian Emergency Department. Australas Emerg Nurs J. 2016;19(2):82-9. doi: 10.1016/j.aenj.2016.04.001.
40. Szeverenyi C, Kekecs Z, Johnson A, Elkins G, Csernatony Z, Varga K. The use of adjunct psychosocial interventions can decrease postoperative pain and improve the quality of clinical care in orthopedic surgery. A systematic review and meta-analysis of randomized controlled trials. J Pain. 2018; 19(11):1231-1252. doi: 10.1002/msc.1142.

ปัจจัยที่มีอิทธิพลต่อความสามารถในการทำกิจกรรมหลังผ่าตัดในผู้ที่มีกระดูกรยางค์ส่วนล่างหักแบบไม่ซับซ้อน

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บทคัดย่อ: การฟื้นฟูความสามารถในการทำกิจกรรมระยะแรกในผู้ที่มีกระดูกรยางค์ส่วนล่างหักเป็นสิ่งจำเป็นที่จะช่วยให้สามารถกลับมาทำกิจกรรมได้อย่างรวดเร็ว การรักษาผู้ใหญ่วัยทำงานที่มีกระดูกรยางค์ส่วนล่างหักแบบไม่ซับซ้อนด้วยการผ่าตัดจะช่วยให้ผู้ป่วยฟื้นฟูความสามารถในการทำกิจกรรมหลังการผ่าตัดได้เร็ว แม้การผ่าตัดรักษาดังกล่าวจะประสบผลสำเร็จ แต่การฟื้นฟูความสามารถในการทำกิจกรรมของผู้ป่วยยังขึ้นอยู่กับหลายปัจจัย การศึกษาสหสัมพันธ์เชิงทำนายครั้งนี้เพื่อประเมินความสามารถในการทำนายของ สถานะภาพการศึกษา ความทุกข์ทางจิตใจ ลักษณะโรงพยาบาล คุณภาพการสอนผู้ป่วยก่อนจำหน่าย ความปวดขณะมีกิจกรรม และความพึงพอใจต่อการดูแล ต่อความสามารถในการกิจกรรมหลังผ่าตัดหกสัปดาห์ในผู้ใหญ่วัยทำงานที่มีกระดูกรยางค์ส่วนล่างหักแบบไม่ซับซ้อน กลุ่มตัวอย่าง 178 ราย ตอบแบบสอบถาม ได้แก่ แบบบันทึกข้อมูลส่วนบุคคล แบบประเมินผลกระทบของอุบัติเหตุฉบับปรับปรุง แบบประเมินคุณภาพการสอนผู้ป่วยก่อนจำหน่าย แบบประเมินความปวด แบบประเมินความพึงพอใจต่อการดูแล และแบบสอบถามการทำกิจกรรมของผู้ป่วยกระดูกรยางค์ส่วนล่างหัก วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนา ค่าสัมประสิทธิ์สหสัมพันธ์ของสเปียร์แมน และการวิเคราะห์ถดถอยพหุคูณแบบเชิงชั้น

ผลการวิจัยพบว่าความทุกข์ทางจิตใจ ลักษณะโรงพยาบาล คุณภาพการสอนผู้ป่วยก่อนจำหน่าย และความปวดขณะมีกิจกรรม เป็นตัวทำนายความสามารถในการกิจกรรมหลังผ่าตัดในผู้ที่มีกระดูกรยางค์ส่วนล่างหักแบบไม่ซับซ้อน โดยตัวแปรดังกล่าวร่วมกันทำนายโดยอธิบายความแปรปรวนความสามารถในการทำกิจกรรมหลังการผ่าตัด 6 สัปดาห์ได้ ร้อยละ 39.4% อย่างไรก็ตาม สถานะภาพการศึกษา และความพึงพอใจต่อการดูแล ไม่ใช่ตัวแปรทำนายความสามารถในการกิจกรรมหลังผ่าตัดในการศึกษาครั้งนี้ ผลการศึกษานี้ช่วยให้พยาบาลนำไปออกแบบกิจกรรมการพยาบาลในการจัดการความทุกข์ทางจิตใจ การสอนผู้ป่วยก่อนจำหน่าย และการควบคุมความปวดโดยคำนึงถึงความสอดคล้องกับลักษณะโรงพยาบาล ซึ่งกิจกรรมการพยาบาลดังกล่าวจะช่วยพัฒนาคุณภาพการพยาบาล และผลลัพธ์ทางคลินิก โดยช่วยให้ผู้ที่มีกระดูกรยางค์ส่วนล่างหักแบบไม่ซับซ้อนสามารถฟื้นฟูกลับมาทำกิจกรรมได้อย่างรวดเร็วตามศักยภาพ

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คำสำคัญ: คุณภาพการสอนก่อนจำหน่าย ความสามารถในการทำกิจกรรมหลังผ่าตัด โรงพยาบาล กระดูกรยางค์ส่วนล่างหัก สาธารณรัฐแห่งสหภาพเมียนมา ความปวด

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A Social Process of School-Aged Children Becoming Overweight

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Abstract: The number of overweight school-aged children has been escalating around the world, even though various weight management programs have been launched in schools. To better understand the phenomena, this study explored the social process of school-aged children becoming overweight. The grounded theory method of Glaser was applied in collecting and analyzing data. There were six parents, four teachers, and a school lunch team leader involved in the study.

The findings resulted in a preliminary model, Social Process of School-Aged Children Becoming Overweight, which demonstrated that the Child's Characteristics and Dietary Intake was a core category. The five remaining categories were Encouraged Eating, Parental Overweight Perceptions, Weight Gain, Observational/Interventional Triggers, and Weight Control. Child's Characteristics and Dietary Intake involved a child's eating behaviors; Encouraged Eating was inside/outside influences that affected a child's eating behaviors; Parental Overweight Perceptions was their viewpoint towards a child's weight status; Weight Gain is weight gained after increased food consumption; Observational/Interventional Triggers are verbal and nonverbally reflected actions towards a child's weight status. Encouraged Eating and Parent's Overweight Perception influenced Child's Characteristics and Dietary Intake and contributed to a child becoming overweight. Diverse weight-management tactics were attempted, but were not strong enough or regularly applied in order to obtain a positive change. Regular weight checkups and formal notifications from the school are needed as an early warning in helping to promote a healthier weight/lifestyle. Understanding the phenomena enables nurses to create more effective weight management programs. Follow up testing and possible modification of the preliminary model are needed for verification.

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Introduction

The prevalence of overweight and obese children has been significantly increasing around the world, in particular, in developed and developing countries. WHO has indicated this issue as one of the critical health problems [1,2] affecting the world today. Overweight/

obese children are at higher risk of being diagnosed with physical (diabetes, hypertension, and hyperlipidemia, etc.) and mental illnesses, [3,4] and being overweight in childhood is a significant predictor of adulthood obesity.[5] Many factors contribute to overweight children such as genetics, environment, and behaviors such as overeating, high caloric consumption, large portion sizes, lack of physical activities, and spending more time on digital devices. [6-8] Major causes of children being overweight in developing countries were increased economic stress, food marketing influences, and the lack of available and safe places for outdoor activities.[9]

The prevalence of overweight children in Thailand is also quickly rising, not only in the big cities but also in the other smaller provinces. Reports from the Health Department survey of the Primary Educational Service years 1-12, indicated an average percentage of overweight/obese school-aged children at 11.7% and 13.07% in August and December of 2018 respectively.[10] A health survey in 2015 of one of the primary schools in Bangkok, reported that there were 3.6%, 3.1% and 5.4% overweight children of grades 1/2/3 respectively. Moreover, there were 18.9%, 15.5%, and 18.3% obese children of grades 1/2/3 respectively.[11] In Thailand, many healthcare providers and researchers launched many weight management programs dealing with this problem in school-aged students.[12-14] Research outcomes have illustrated that children are more informed and are developing healthier routines. However, these did not demonstrate significant outcomes in the decreasing of the children's weight status.

Ecological System Theory[15] was developed by Urie Bronfenbrenner the USA into a model to illustrate various factors that are related to a child's weight gain. The Model explains three layers of risk factors (from inside to outside), 1) Individual Level (child weight status, child characteristics, and child risk factors, 2) Household Level (parenting styles and family characteristics, and 3) Community Level (community, demographics and social characteristics). However, the Ecological Model does not illustrate relationship/interaction as a process to explain the phenomenon. In Thailand, Jumpee Granger[16] developed a model "The Sustain Weight Gain in Young Children" to illustrate a process of young children becoming overweight. This suggested that encouraged feeding behaviors and parental positive perceptions played an essential role in affecting a young child becoming overweight. However, there is still little known about what social factors are contributing to school-aged children becoming overweight, hence this study.

Study Aim

The aim of the study is to explore the social process of school-aged children becoming overweight.

Methods

Study design and theoretical framework: Glaser and Strauss's grounded theory[17] and Glaser's later works[18,19] were chosen to inform the methodology in this study. Grounded theory (GT) is a vital strategy for exploring holistic realities and capturing the meanings of human behaviors. The study design goes beyond describing the phenomenon of school-aged children becoming overweight. Grounded theory is achieved by creating and connecting categories of information based on the integrated properties of the phenomena during data collection and analysis. The theoretical framework of symbolic interactionism[20], how individuals interact with one another by creating their symbolic worlds, plays a significant role in GT. This framework provides a guiding analysis for generating a theory, such as explaining the social process of how school-aged children become overweight; and GT centers on patterns of interactions between individuals, such as communication, adjustments, and interpretations.[21]

Sample and setting: The setting for this study was a primary school located in Bangkok, Thailand.

Participants were recruited by the school nurse. There were four groups of participants: 1) Parents taking care of an overweight/obese student in grades 1-3, who presented without chronic illnesses that affected their weight status: 2) Homeroom teachers who served lunch and taught these students; 3) The health education teacher who created the lunch menu and taught students about health relevance; and 4) The school lunch team leader who cooked lunch for all children at the school. The participants were all over 18 years old; and all spoke Thai. Theoretical sampling was included in this study as it was part of the data collection in GT and guides future data collection, such as where to go to collect more data to develop an emerging theory.

According to the children's Thai Growth Chart[22], there are four categories of overweight/obese children: overweight, mild obesity, moderated obesity, and severe obesity. A child in the overweight category is defined as >97th percentile of weight by age and gender, while one with mild obesity is defined as a 120-140th percentile, moderate obesity 140-160th, and severe obesity >160th percentile by weight for height and gender.[23]

Ethical considerations: Ethical approval (Number 2559/351) was given by the Ramathibodi Hospital Institutional Review Board (Thailand) and data collection permitted by the principal of the school. All potential participants were contacted by the school nurse, and they were free to decide if they wanted to participate in the study, or not. They were also informed that if they wished to stop the interview process, they could do it at any time. Informed consent was signed as confirming their agreement before participating in the study. The participants' anonymity was maintained throughout the study.

Data collection: There were four methods of data collection: observations, in-depth interviews, journal writings, and document reviews. The researchers interviewed in-depth participants once, and again if needed, based on the need for data clarification[24]. For parents, the interview started with open-ended questions such as "*How do you take care of your child?*", "*How do you evaluate your child's weight status?*" and "*What do you feel are the consequences of children being overweight?*". For teachers, the questions of the interview focused on weight gain relevance such as "*What is their behavior during the day?*"," *How do they interact with other students?*", "*What are the student's physical characteristics?*", "*How do you provide for the student's health/activities?*", also, "*What is the student doing differently from others?*". *F*or the school lunch team leader, interview questions focused on "*What types of food do you cook for students*?" or "*Who created the menu for your team*?"

Observations[24]: the researchers observed participants during interviews such as, how they reflected on their feelings, body language, and were they worried about the child's weight status. Journal writings: the parents were asked to participate in three days of journal writing on (a) types of food that they prepare/buy for their child during the day (weekend and weekday), including amount and frequency; (b) types of food that their child bought and ate during the day, (c) their child's activities during the day; and (d) anything else they wanted to write about themselves and/or their child. Document reviews: the researchers reviewed the school health record of the children relating to demographics, history of illness and weight status.

Data analysis: This study used Glaser's GT[19-20] approach, substantive (open and selective coding) and theoretical coding, for data collection and analysis as follow:

1) Substantive coding: the researchers read and reread the first set of data including interview transcripts, review documents, observational field notes, and journal writings until they understood the data, and then they coded the transcripts line-by-line as open coding. The coded data were grouped, and all beginning concepts were found and identified. The constant comparative approach was applied to compare similarities and differences among these concepts in order to generate diverse categories and their properties by using coding families (6C): cause, contexts contingencies, consequences, covariance, and condition (see example in **Table 1** below).

Table 1 An example of data analysis

Description	Code	Category	6 Cs
I always provide bread at home because when my daughter is hungry, I want her to have something to eat, but I notice that she eats too much of the bread and quickly.	Inside environment	Encouraged eating	Cause

Memos were written to describe the properties of each category. The researchers also used theoretical sampling to explore new concepts; for example, the types of a family (nuclear or extended family) and the different family financial statuses. The type of family may play a significant role in encouraging the children to eat more (or less), and the different financial statuses may affect the eating behavior of the children. Another example of theoretical sampling was different environments; the researchers found that outside factors such as food vendors were an influence on children's high caloric intake, or over-consumption. During follow-up interviews, the researchers used probing questions to gain more of an explanation relating to the children's eating behaviors. Questions focused on "*What kind of outside foods does the child always eat?*", "*How much and how often do they eat?*", and "*Any outside food resources that encourage your child's overeating?*" This procedure helped to gain rich descriptions and develop concepts to cover all explanations relevant to weight gain in children.

The next set of data collection from participants was analyzed in the same way as the first, which added in initializing the concepts and categories. During the analysis, the researchers used a constant comparative method to compare the following data set to the previous one of each participant. The method helped the researchers to verify the similarity or differences of each data set. Theoretical sampling technique was continually applied in collecting more data to fill unsaturated categories. When the properties of the categories were saturated (no new conceptual properties had emerged), the data arrangement by the research team was processed, including renaming categories and their properties until they fitted well. Coding families were again used to develop relationships between categories as a prospective theory. When a prospective theory had emerged, selective coding was applied to generate the core category that methodically related to other categories. Some categories which were not related to the core category were excluded or delimited by using the constant comparative method.[17]

2.) Theoretical coding, memo sorting, was used to integrate substantive coding in creating an explanation as a preliminary model. The model demonstrated a relationship among categories as a social process that affected school-aged children being overweight. After the theoretical coding was saturated, the outcome was brought back to discuss with the research team as part of the reviewing process. The outcome as categories and their relationship to each other were revised during this process. One additional set of data was collected from a new participant to verify the model. The model was also brought back to discuss with two of the participants (one parent and a homeroom teacher).

Rigor and trustworthiness: this study used Glaser's GT[20] approach to ensure whether all categories emerged from data, or not. The researchers used a constant comparative method to verify discrepancies between the data set and to lead the researchers in probing for more explanation. The method was done to ensure that the concepts produced a more compelling explanation relevant to the children's increased weight gain. This study also used Lincoln and Guba[25] principles to gain rigor of the study. Member checking technique was used with participants during the interview by asking for clarification and confirmation of understanding, and the technique was used again to confirm summary findings. Triangulation was used in each step of the study such as different techniques (interviews, observations, health records, and journal writings) were used to collect and compare data. Peer debriefing was involved throughout the data collection and analysis process, for cross-checking, to help the researchers ensure the interpretation of conclusive findings and reducing the researcher's bias.

Findings

The findings are composed of two parts, participants' characteristics and the preliminary model of the Social Process of School-Aged Children Becoming Overweight.

There were six parents, four of whom lived in single-family homes, and two parents in homes that included extended family. The individual incomes of all the families were more than 25,000 baht (~US$833) monthly. There were also three school homeroom teachers, one health education teacher, and a school lunch team leader that participated in the study. All participants spoke Thai exclusively and lived in Bangkok or the adjacent provinces. By reviewing children's health records, it was found that one student was mildly obese, two were moderately obese, and three were severely obese.

The preliminary model of the Social Process of School-Aged Children Becoming Overweight was comprised of six categories. The core category was the *Child's Characteristics and Dietary Intake*. The other categories were *Encouraged Eating*, *Parental Overweight Perception*s, *Weight Gain, Observational/ Interventional Triggers*, and *Weight Control.*

Child's Characteristics and Dietary Intake (CCDI): Findings showed that all overweight/obese children had the same behavior. They enjoyed eating, and they could either eat a large portion of food or eat more often per day, and they all preferred high caloric food. One mother revealed that her child liked to eat everything, in particular, crispy pork. (P1) while another confirmed that her child could eat large portions:

> *He always asked for more food for lunch* (from his teacher)*. He could eat almost two to three times as much as his friends.* (P5)

A homeroom teacher of each class distributed lunch to children depending on how much each student was able to eat based on his/her experience. Some overweight children enjoyed lunch at school. One teacher said:

> *As I notice, overweight children are more likely to eat larger portions than children who are healthy weight or underweight. For example, when they finish lunch in a room, they always go down to buy some more food. Even though some of them do not have enough money to buy extra food, they will tend to ask for food from their friends.* (T1)

This was consistent with what one parent said:

> *My child eats everything, and he can eat three dishes for his lunch meal.* (P5)

However, one teacher revealed that some overweight children did not eat more than others at school. (T2), as confirmed by a parent:

> *My child did not eat much at school lunch because he said the food was not delicious. He would eat more food after school instead.* (*P3*)

Parents expressed that they bought or prepared their child's food based on their preference and the children were more likely to eat high-calorie foods such as french fries and fried chicken. Most of them loved to eat frozen food from convenience stores. According to a teacher, parents were observed providing soda for their child after class because the child liked it. Therefore, these overweight children's behavior with dietary intake, even having large or small portions of school lunch, gradually contributed to their weight gain as is illustrated by the journal writings. The writings evidenced that all of the children received higher calories than they should have according to suggested weight and height recommendations.

Encouraged Eating (EE): Several outside influences encouraged children to eat more often, as well as have a higher calorie intake, and some of these influences were not healthy choices. These influences included food vendors in front of the school, and convenience stores nearby their house, and were a critical factor that encouraged children to eat unhealthy food such as soda, fried foods, and ice cream. One teacher expressed:

> *Even though we can control the sellers who sell food in our canteen to provide healthy food choices, we cannot control food vendors in front of our school because it is a public place that our school does not have the authority to prohibit them. Government officers seem to do nothing to enforce the laws. When the last class of the day is over, children always buy food from food vendors, before they go back home or while waiting for parents to pick them up.* (T1)

Another influence was nearby convenience stores. Most parents mentioned that their child always seems to grab something from the convenience store before going home such as crackers, cookies, or sweet treats. One mother said:

> *It is difficult to control my child from grabbing something while in the convenience stores because she often puts a treat into the basket without permission, and sometimes I did not realize it until paying at the cashier station.* (P1)

Moreover, eating out was one of the outside influences that encouraged children to overeat, with higher calorie foods and larger portions. One mother said:

> *I bring my child to eat out more often. Mostly we eat fast food, for example, pizza, fried chicken, and burgers. (P3)*

The inside influence included cases where normal food was provided in the house, but other snacks or portions were provided by members of the extended family. This combination also encouraged children to eat more often than they should. One mother revealed that:

> *I always buy discount food supplies from convenience stores that unintentionally encourage my child to eat these foods more often.* (P1).

Another parent stated that their child ate more often with family members and some of them spoiled the children with food. (P2) As overweight children spent more time at home during school breaks, they tended to gain more weight. One teacher mentioned:

> *I have noticed for many years that after a school break the children look chubbier, but as the semester progressed they would gradually look thinner.* (T1)

This aligned with the views of another mother:

> *When my child did not go to school, she would eat more often at home.* (P6)

Parental Overweight Perceptions (POP): Parents shared different perceptions toward their child's weight status and growth needs. For example, they tended to have positive perceptions when their child had reached overweight status. However, later on, when their child gained more and more weight, as well as had some health problems, they started to perceive that their child is becoming overweight, and worried about the child's future health problems. For example, one mother of a 10-year-old boy stated:

> *When he was younger, my boy was so small and later on I was so happy when I saw he could eat larger portions of food and enjoyed eating. Now he is too big, and I have tried my best to lower his weight.* (P5)

Another mother stated:

> *She looked big when she was five years old, and I thought it was still ok. However, when she turned seven years old, she looked too big when I compared her to her friends. She also had loud snoring at night time, and sometimes her breathing would stop shortly. First I thought it was normal for children, but a doctor said it was dangerous and we have to work on controlling her weight seriously.* (P6)

All parents tended to perceive their child as overweight, usually at the point where the child had reached mild obesity, or when they had developed health problems.

Weight gain (WG): Even though parents did not know their child's exact weight status, many indicators were suggesting the child's weight was increasing. In this study, the weight gain was calculated as weight status using the weight for height recommendation of the Pediatric Endocrine Society of Thailand Growth Chart.[22]

Observational/interventional triggers (OIT): Even though parents did not know precisely if the child overweight or obese or not, many triggers informed them. The triggers were observations from parents, innocent greetings from the child's friends, strangers, suggestions from health care providers, and their child health problems. One mother admitted that she realized her child was overweight from observations from strangers, her daughter's friends, and her observations:

> *Everyone who spoke to me would say she looked like a teenager, or sometimes strangers mentioned her body size was close to my own. Even her friends would sometimes call her fatty girl, but she would not care because two other children were much chubbier than her in her school room. I also noticed that she was becoming overweight when I had to change her student outfit more often, and I had a difficult time finding the right size because she had a larger belly.* (P4)

Another mother shared that a doctor informed her that her child was overweight:

> *He was getting sick when he was seven years old at the time, and a doctor mentioned that he was becoming overweight and suggested I bring him to a nutritional clinic.* (P5)

The triggers mentioned above played a pivotal role in informing parents and family members to think about, and be concerned about, the consequences of their child's weight status.

Weight Control (WC): When parents perceived that their child was overweight, they had applied various strategies to control the child's weight, such as limiting some foods/snacks/treats and encouraging more physical activities. One mother tried to limit her child's amount of food:

> *After a doctor informed me that my child had become overweight, I tried to limit his snacks and cut his regular meals in half.* (P5)

Another mother told her daughter's teacher to please not refill her plate of food if she asked, whilst one other mother tried to apply a schedule to her child's food intake:

> *After I met a nutritionist, she gave me a food schedule to set a time when I should give food to my child, what types of food, and how much she should eat* (P4)

Some parents tried to create more activities for their children:

> *I tried to encourage her to do more activities, for instance, on weekdays, she did hula hoop dancing while she was watching TV. For the weekend, I brought her out to a playground, and sometimes we swam at the pool.* (P1)

However, it was difficult to control a child's weight because the factor of encouraging eating affected family members, neighbors, and other environments (convenience stores, food vendors). One mother stated:

> *I tried my best to control her weight, but every evening when her grandmother picked her up from school, she always bought my daughter some food from food carts in front of the school. I knew that these were mostly unhealthy foods.* (P6)

The other mother mentioned that:

> *When he goes to the convenience store with his dad, he always buys whatever he wants to eat. If I went with them, I would only pick healthy food for him.* (P5)

There were various strategies that parents and family members tried to practice. However, some other factors mentioned above made the practice less consistent, and it was not enough to be successful as they should have been.

A Preliminary Model of a Social Process of School-Aged Children Becoming Overweight (SPSCBO)

Analysis in this study lead to the development of a preliminary theoretical model (SPSCBO) that illustrated the emerging six categories interacting with one another (see **Figure 1** below). At the beginning weight gain came from the interaction between a child's characteristics and dietary intake (CCDI) and encouraged eating (EE). In the beginning, the level of EE was typically high and the level of parental overweight perceptions (POP) was low, therefore they would perceive the level of CCDI as being lower than it was. A higher level of CCDI was associated with weight gain in the children. When the children gained more weight, the level of observational/interventional triggers became progressively higher. These triggers increased the level of parental overweight perceptions, and some weight control measures then started to decrease the level of CCDI.

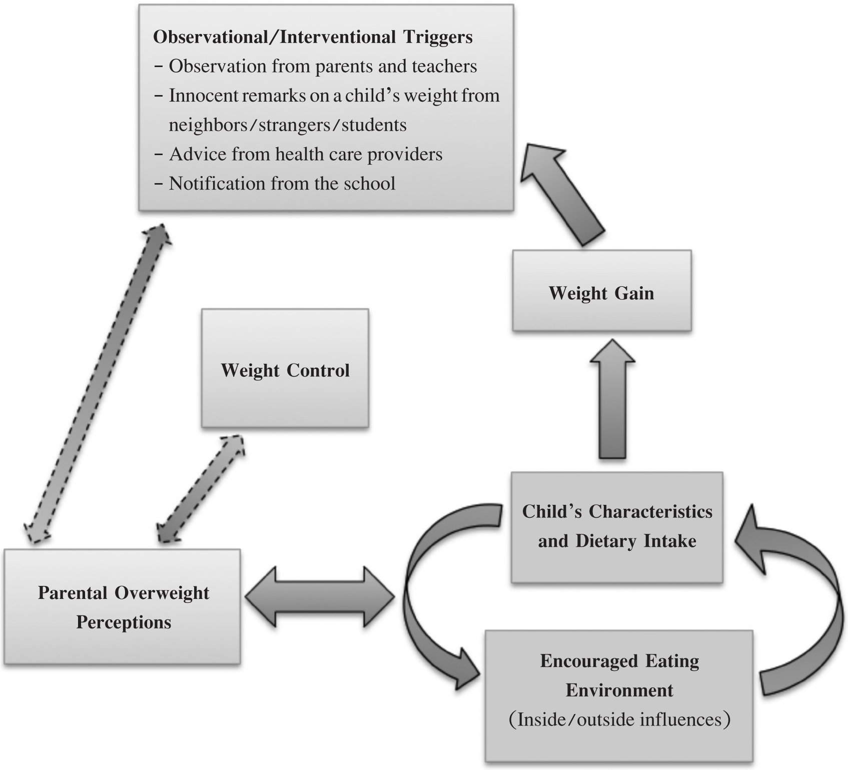

Figure 1. A Preliminary Model of a Social Process of School-Aged Children Becoming Overweight (SPSCBO)

Child's characteristics and dietary intake demonstrated that children were over-eating during regular meals, by eating larger portions or consuming higher calorie foods. They also had extra food provided by family members or ate other snacks more often. The outcome was that that the level of CCDI was always higher, and had never trended downward. However, the CCDI level fluctuated based on the POP level, which played a significant role in readjusting the CCDI level.

The level of EE depended on the level of inside/outside influences in their environment. The EE level would steadily increase if the level of inside/outside influences also increased. The environment levels were inconsistent from one family to the next, and if parents had changed their perceptions, the environment levels would also adjust. The POP was defined as parents' attitudes towards their child's eating behaviors and their growth. The POP level fluctuated and would increase if the WG level and OIT level increased. The OIT and WG levels were positively associated with each other. When the level of POP increased, parents and family members tended to apply more WC consequently, and the WC affected the CCDI pattern. Weight control when applied was neither consistent nor reliable enough to adjust the CCDI pattern significantly.

Discussion

The preliminary model of SPSCBO illustrated that POP play a significant role in controlling their child′s weight. To adjust POP, the OIT has to be reliable and consistent. Surprisingly, OIT from the school in this research study was low. According to information from the school nurse, once per year she notified parents and family members about the child's weight status (if they are overweight/obese) and provided them with weight control brochures. The follow up was lacking with these overweight children, or they were not strictly followed enough. One teacher mentioned that she tried to create a weight reduction intervention program for overweight children, but the school policies and other teachers were more focused on academic activities than they were on students' health. The children, consequently, did not have enough time to continue taking part in her weight reduction program. Granger[16] noted that the critical OIT in younger children was reported by a doctor who was at the time giving these children a vaccine. However, the overweight children in this research had already finished with their vaccine schedules, and they would only meet with a doctor by chance if they were sick. Therefore, the school needs to play a pivotal role in creating an earlier, stronger and consistent OIT to warn parents and family members sooner, to try to control overweight in children before they step up to obese status.

Child's Characteristics and Dietary Intake: A number of research studies[7,8] illustrated that food intake, such as high calorie and sweetened foods, fast foods and larger portion sizes, played a crucial role in children becoming overweight. This study revealed the same conclusion, that children overeat on a regular daily basis, including additional snacks and treats. The children's characteristics in the study were presented as their enjoyment in eating, they could eat larger portions, and they liked to eat high calorie foods. Even though young children can self-regulate their eating, in order to protect against overeating[26] the children in this study seem to fail in regulating themselves from overeating. The reason may be because they are genetically predisposed to a lower level of self-regulation and tend to be susceptible to indulgent parents and overweight environment factors.[27] They may have also been exposed to feeding practices of larger portions from a very young age. This practice would have compromised and contributed to their failure to self-regulate in responding to their appetite cues.[28] Another reason is that parents may use food to reward their child; and this could be associated with the child's self-regulation or his/her emotional state when presented with new food.[29]

Encouraged Eating: The results of the preliminary model demonstrated that the level of WG comes from the interaction between the levels of CCDI and EE. The level of EE, demonstrated as inside and outside home environments, is high and influences children becoming overweight. The outside environment included food vendors in front of the school or unhealthy food from nearby convenience stores. Many research studies also showed that specific outside environments would influence a child becoming overweight but in different aspects, such as Granger[16] who remarked that the available mobile food merchants, or foods shared with strangers or neighbors causing a young child to become overweight or obese. The hot weather and lack of safe areas to exercise contribute to a decrease in outdoor activities and significantly increase the children's BMI. [30]

This study demonstrated the same result as other studies[31,32] regarding the inside environment that encouraged children to eat more often than they should. This included feeding by extended family members, food available in the home, spending time watching TV and playing with smartphones, or other electronic devices. Singhasai[33] also pointed out that viability of food in the house, a poor dietary pattern, and an authoritarian and permissive food parenting style had an indirect influence on a child's unhealthy eating patterns and his/her weight status. Li et al.[34] found that children who lived in a nuclear family were less likely to be overweight than children who lived with at least two grandparents.

Parental Overweight Perceptions: parental overweight perceptions play a significant role in determining if their child becomes overweight or not, with one study[35] showing that a parent's viewpoints have a pivotal role in influencing whether their child developed a healthy lifestyle, and continued to maintain it. As the model shows, parents and family's member tend to underestimate weight status by the time the preliminary child has already reached the overweight status. They tended to accept the child's weight as normal and refused to intervene, and declined to join a nutrition clinic or weight control program. The reason may be because a chubby baby is perceived as healthy and robust among the Thai people. Of concern, has been found that the perceptions of parents are directly associated with the child's weight status. For example, parents who have an overweight child are less likely to be concerned about the child's weight status compared to parents who have a child of normal weight status.[36-37] Another study[38] demonstrated that mothers were misclassifying their child's weight status in Australia, for the age group of 5-14 years.

When a child gains more weight, this influences the OIT level to become higher, in particular, the child's health problems (sleep apnea, hyperlipidemia), and the parents and family members began to become concerned with their child's health problems. They tried to control the child's weight, by limiting food/diet or creating more physical activities. Unfortunately, when the child had physical problems, they tended to be at a higher level of obesity, and when it is more challenging to begin a weight reduction program. Our finding about this aligned with another study [39] illustrating that most parents of overweight students perceived their child's weight status as a problem at the point when the child's health problems began to present.

When comparing the Sustaining Weight Gain in Young Children (SWGYC) [16] model to the SPSCBO model, both demonstrated that all the children liked to eat, and they preferred to eat higher calories and larger portions of food. They also lived in an environment that encourages them to eat more often than they should be. The SWGYC model illustrated that child-feeding practices plays a significant role as a core category in contributing to a young child becoming overweight. Even though strong triggers such as suggestions from health care providers were given to the parents, the parents continued to have positive perceptions such as "brain growth needs enough nutrition," "too young to restrict food," and "will lose weight when they go to school." They did not control their child's weight strictly and consistently enough.

The SPSCBO model, on the other hand, reveals the point when trigger levels are lower, in particular, notification of weight status by the school. Stronger triggers of notification from health care providers when the child's weight reaches severe obesity levels or having current health problems would increase the parents' perception about their child's weight grain. This is critical since it is more difficult for parents and presumably the children to undertake weight control when the child reaches a level of severe obesity.

Limitations

This research study used GT as a methodology. The findings, which were developed into a preliminary model, involved just one specific group and geographical area and are thus limited in their application to other groups. The model requires testing, and possible modification before being used regularly in practice.

Conclusions and Implications for Nursing Practice

The outcome of this study was a preliminary model that explains the social processes that affects school–aged children becoming overweight. The developed theory helps better understanding the phenomena. From the holistic point of view, all factors should be taken into account, to bring about positive changes in weight control, including school (inside/outside) environment as well as the home and broader community and social factors.

In raising the parents' awareness to practice their child's weight control earlier, school nurses and health education teachers should create an effective follow–up system based on weight status to allow early detection of those children most at risk of becoming overweight, and to include the family or caregivers in the discussion. As discussed above, the OIT from school was low, thus making parents and family less concerned about the problem. The system should plan how often to notify parents, at what point the school should meet with them, and understand and use clear guidelines for taking care of an overweight/obese child. For example, students' weight status screening should be arranged at least once per semester, and if any students' weight status is shown to be overweight, the school nurse should notify the parents right away and do a follow–up on the weight status of those students' every month. If the student's weight status is still increasing, the school nurse should make an appointment to talk with the parents about a weight management program.

A variety of strategies in weight management programs from school nurses, health care providers, and health education teachers to control weight status should be discussed individually with overweight children and their families. As the discussion shows above, the inside/outside influences in each family are different from case to case. If a weight reduction program is created, individual environmental family differences should be considered. For example, if the cause of a child's overweight status is due to buying non–healthy foods from convenience stores, the school nurse should discuss with the parents on how to put limits on this practice. If family members are contributing to overeating that causes a child to become overweight, the school nurse can discuss with the parents how to limit extra food from these family members, and try promoting the serving of healthier fruits/foods that are lower in sugar/calories.

Collaboration between school nurses, health care providers, and health information technology experts is recommended in order to develop new technologies for the creation of better tools for weight reduction programs. As many parents expressed that it was difficult to control their child's weight because they do not know precisely how much their child should eat, and when they are overeating. An application on a smartphone, such as a calorie calculation based on a food source, should be developed to help parents and family members in calorie counting. A research study based on communication skills for parents and family members needs to be conducted to develop a program to help these parents and family members handle uncooperative children.

A law is required to impede selling unhealthy food in front of schools is needed, for example, getting rid of food vendors, who park in public areas in front of schools. A healthy snack policy is also needed to promote the prevention of overweight children. As one research study[40] showed, environmental improvements and better policies did help in the prevention of obesity in children in 49 communities found in the United States and Puerto Rico.

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References

1. Novotny R, Fialkowski MK, Fenfang L, Paulino Y, Vargo D, Jim R, et al. Systematic review of the prevalence of young child overweight and obesity in the United States–affiliated Pacific region compared with the 48 contiguous States: The children›s healthy living program. American Journal of Public Health. 2015;105(1):e22-35. PubMed PMID: 2012828671.
2. Sundaram ME, Berg RL, Economos C, Coleman LA. The relationship between childhood BMI and adult serum cholesterol, LDL, And ankle-brachial index. Clin Med Res Clinical Medicine and Research. 2014;12(1-2):33-9.
3. Pulgarón ER. Childhood obesity: a review of increased risk for physical and psychological comorbidities. Clinical Therapeutics. 2013;35(1): A18-32. PubMed PMID: 2012027702.
4. Sanguansak R, Lakkana R. Association of obesity with the prevalence of hypertension in school children from central Thailand. Journal of Research in Health Sciences. 2015; 15(1):17-21.
5. Mistry SK, Puthussery S. Risk factors of overweight and obesity in childhood and adolescence in South Asian countries: a systematic review of the evidence. Public Health (Elsevier). 2015;129(3):200-9. PubMed PMID: 2013002324.
6. Sridhar SB, Darbinian J, Ehrlich SF, Markman MA, Gunderson EP, Ferrara A, et al. Maternal gestational weight gain and offspring risk for childhood overweight or obesity. American Journal of Obstetrics and Gynecology. 2014; 211(3):259.e1-.e8.
7. Robinson TN, Banda JA, Hale L, Shirong Lu A, Fleming-Milici F, Calvert PSL, et al. Screen media exposure and obesity in children and adolescents. Pediatrics. 2017;140: S97-S101.
8. Poti JM, Duffey KJ, Popkin BM. The association of fast food consumption with poor dietary outcomes and obesity among children: is it the fast food or the remainder of the diet? American Journal of Clinical Nutrition. 2014;99(1): 162-71.
9. Berggren S, Roswell J, Alm B, Bergman S, Dahlgren J, Almquist-Tangen G. Parents with overweight children two and five years of age did not perceive them as weighing too much. Acta Paediatrica. 2018;107(6):1060-4.
10. Ministry of Public Health [Internet]. 2019 [cited 2019 Apr 28]. Available from:https://hdcservice.moph.go.th/hdc/reports/report.php?source=pformated/format1.php&cat_id=4652 2b5bd1e 06d24a5bd819 17257a9 3c&id=e28682b2718e6cc82b8dbb3e00f2e28e
11. Thailand 2015 Global School- Based Student Health Survey. Bangkok: World Health Organization, Thailand country office; 2017. License: CC BY-NC-SA 3.0 IGO 2009;40(4):816-34.
12. Mayurachat K, Warunee F, Jutamas C, Patcharaporn A, Kennedy C. An intervention study of changing eating behaviors and reducing weight in Thai children aged 10-12 Pacific Rim International Journal of Nursing Research. 2013;17(4):317-28.
13. In-Iw S, Saetae T, Manaboriboon B. The effectiveness of school-based nutritional education program among obese adolescents: a randomized controlled study. International Journal of Pediatrics. 2012;2012(3):1-5.
14. Phaitrakoon J, Powwattana A, Lagampan S, Klaewkla J. The diamond level health promoting schools (DLHPS) program for reduced child obesity in Thailand: lessons learned from interviews and focus groups. Asia Pacific Journal of Clinical Nutrition. 2014;23(2):293-300.

15. Bronfenbrenner U. Ecology of the family as a context for human development: research perspectives. Dev Psych. 1986;22 :723-724.
16. Granger J, Dundon E, Jacelon C. A grounded theory study of social processes that influence a child being overweight in Bangkok. Pacific Rim International Journal of Nursing Research. 2017;21(2):108-20.
17. Glaser BG, Strauss AL. The discovery of grounded theory; strategies for qualitative research. Chicago: Aldine Pub. Co.; 1967.
18. Glaser BG. Basics of grounded theory analysis. [S.l.]: Sociology Press; 1992.
19. Glaser BG. Theoretical sensitivity. [S.l.]: Sociology Pr; 1978.
20. Charmaz K. Constructing grounded theory: a practical guide through qualitative analysis. London; Thousand Oaks, Calif.: Sage Publications; 2006.
21. Blumer, H. Symbolic interactionism; perspective and method. Englewood Cliffs, N.J.: Prentice-Hall; 1969.
22. Ministry of Public Health. National growth references for children under 20 years of age. Nutrition Division. 1999.
23. Jetsrisuparb A. Pediatric obesity and overweight. Haamor.com [Internet]. 2015. [cite 2018 Oct 15]. Available from: http://haamor.com.
24. Munhall PL. Nursing research: a qualitative perspective. Sudbury, Mass.:Jones and Barlett. (2007).
25. Guba, E.G. Criteria for assessing the trustworthiness of naturalistic inquiries. Educational Communication and Technology. 1981;29: 75-91.
26. Birch LL, Johnson SL, Jones MB, Peters JC. Effects of a nonenergy fat substitute on children›s energy and macronutrient intake. The American journal of Clinical Nutrition. 1993 58(3):326-33.
27. Birch LL, Fisher JO, Davison KK. Learning to overeat: maternal use of restrictive feeding practices promotes girls› eating in the absence of hunger. The American journal of clinical nutrition. 2003;78(2):215-20.
28. McCrickerd K. Cultivating self-regulatory eating behaviors during childhood: The evidence and opportunities. Nutrition Bulletin. 2018;43(4):388-99.
29. Powell EM, Frankel LA, Hernandez DC. The mediating role of child self-regulation of eating in the relationship between parental use of food as a reward and child emotional overeating. Appetite. 2017;113:78-83.
30. Schalkwijk AAH, van der Zwaard BC, Nijpels G, Elders PJM, Platt L. The impact of greenspace and condition of the neighbourhood on child overweight. European Journal of Public Health. 2018;28(1):88-94.
31. Raistenskis J, Sidlauskiene A, Cerkauskiene R, Burokiene S, Strukcinskiene B, Buckus R. Physical activity and sedentary screen time in obese and overweight children living in different environments. Central European Journal of Public Health. 2015;23:S37-S43.
32. Miyakoshi C, Yamamoto Y, Mishina H, Shirai C, Morioka I, Fukuhara S. Childcare Environment and Japanese Children Who Are Overweight in Early Childhood. Childhood Obesity. 2018;14(3):197-206.
33. Singhasai L, Phuphaibul R, Orathai P, Piaseu N, Darling-Fisher CS. Predictors of weight status among school-age children. Pacific Rim International Journal of Nursing Research. 2017;21(3):180-94.
34. Li B, Adab P, Cheng KK. Family and neighborhood correlates of overweight and obesogenic behaviors among Chinese children. Int J Behav Med International Journal of Behavioral Medicine. 2014;21(4):700-9.
35. Jaballas E, Clark-Ott D, Clasen C, Stolfi A, Urban M. Parents' perceptions of their children's weight, eating habits, and physical activities at home and at school. Journal of Pediatric Healthcare. 2011;25(5):294-301.
36. Nemecek D, Sebelefsky C, Woditschka A, Voitl P. Overweight in children and its perception by parents: cross-sectional observation in a general pediatric outpatient clinic. BMC Pediatrics. 2017;17:1-10.
73. Rachmi CN, Hunter CL, Mu L, Baur LA. Perceptions of overweight by primary carers (mothers/grandmothers) of under five and elementary school-aged children in Bandung, Indonesia: a qualitative study. International Journal of Behavioral Nutrition & Physical Activity. 2017;14:1-13.
38. Hirschler V, Molinari C, Gonzalez C. Maternal misperceptions of children's overweight in an Indigenous Argentinean community. American Journal of Health Behavior. 2015; 39(3):138-44.
39. Schwartz M. Parental perceptions of body mass index notification: a qualitative study. Journal of School Health. 2015;85(10):714-21.
40. Brennan LK, Brownson RC, Orleans CT. Childhood obesity policy research and practice: evidence for policy and environmental strategies. American Journal of Preventive Medicine. 2014;46(1):e1-e16.

กระบวนการทางสังคมของเด็กวัยเรียนที่มีน้ำหนักเกินมาตรฐาน

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บทคัดย่อ: จำนวนเด็กวัยเรียนที่มีน้ำหนักเกินมาตรฐาน มีจำนวนเพิ่มขึ้นทั่วโลกถึงแม้ว่าโรงเรียนต่างๆ จะมีโครงการหลายโครงการในการควบคุมน้ำหนักเด็กเหล่านั้น งานวิจัยฉบับนี้มีวัตถุประสงค์ในการค้นหากระบวนการทางสังคมของเด็กวัยเรียนที่มีน้ำหนักเกินมาตรฐานเพื่อทำความเข้าใจปรากฏการณ์ดังกล่าวให้ดีขึ้น โดยใช้การวิจัยเชิงทฤษฎีพื้นฐานของเกลเซอร์ ในการเก็บและวิเคราะห์ข้อมูล มีผู้เข้าร่วมโครงการเป็นบิดามารดาจำนวน 6 คน ครูจำนวน 4 คน และหัวหน้าทีมในการเตรียมอาหารกลางวันในโรงเรียน 1 คน ผลการวิจัยเป็นการเสนอ รูปแบบจำลองกระบวนการทางสังคม ของเด็กวัยเรียนที่มีน้ำหนักเกินมาตรฐาน ซึ่งพบว่าตัวแปรที่สำคัญในกระบวนการนี้คือ การรับประทานอาหารและลักษณะเฉพาะของเด็ก ส่วนตัวแปรอื่นๆ ได้แก่ การกระตุ้นการรับประทานอาหาร การรับรู้ของผู้ปกครองต่อ น้ำหนักเด็ก การสังเกตหรือกระตุ้นเตือนและการคุมน้ำหนัก เป็นตัวแปรรองในกระบวนการนี้ ซึ่งการรับประทานอาหารและลักษณะเฉพาะของเด็กหมายถึงพฤติกรรมการรับประทานอาหารของเด็ก การกระตุ้นการรับประทานอาหารหมายถึงสิ่งแวดล้อมภายในและภายนอกบ้านที่มีผลต่อพฤติกรรมการรับประทานอาหารของเด็ก การรับรู้ของผู้ปกครองต่อน้ำหนักเด็กหมายถึงการรับรู้และมุมมองของผู้ปกครองที่มีต่อภาวะน้ำหนักเด็ก การเพิ่มของน้ำหนักหมายถึงน้ำหนักที่เพิ่มขึ้นของเด็กหลังจากที่มีพฤติกรรมในการรับประทานอาหารเพิ่มขึ้น การสังเกตหรือกระตุ้นเตือนหมายถึงการแสดงออกทั้งทางวาจาและท่าทางของผู้เลี้ยงดู หรือบุคคลต่างๆ ต่อน้ำหนักของเด็ก โดยงานวิจัยพบว่าการกระตุ้นการรับประทานอาหารและการรับรู้ของผู้ปกครองต่อน้ำหนักเด็กมีผลต่อพฤติกรรมในการรับประทานอาหารของเด็กซึ่งทำให้เด็กมีน้ำหนักเกินมาตรฐาน แม้จะมีความพยายามในการใช้วิธีการต่างๆในการควบคุมน้ำหนักเด็ก แต่วิธีการเหล่านี้ไม่ได้เข้มงวดและต่อเนื่องพอที่จะควบคุมน้ำหนักเด็กได้ งานวิจัยได้ชี้ให้เห็นว่าการติดตามประเมินภาวะน้ำหนักเด็กอย่างสม่ำเสมอและการแนะนำจากโรงเรียนเป็นสิ่งจำเป็น ซึ่งเป็นเสมือนการกระตุ้นเตือนล่วงหน้าที่จะส่งเสริมให้เด็ก มีพฤติกรรมการรับประทานที่ดีและมีน้ำหนักอยู่ในเกณฑ์ปกติ การเข้าใจปรากฏการดังกล่าวจะช่วยให้พยาบาลและผู้ที่เกี่ยวข้องสามารถริเริ่มโครงการควบคุมน้ำหนักเด็กในวัยเรียนได้อย่างมีประสิทธิภาพและควรมีงานวิจัยเพิ่มเติมเพื่อทดสอบรูปแบบจำลองดังกล่าวหรือทดสอบความสัมพันธ์ของตัวแปรต่างๆ

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Association of Structural and Psychological Empowerment with Depersonalization and Personal Accomplishment Among Nurses: a Systematic Review

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Abstract: Burnout is a significant issue among nurses, and it impacts to the quality of care they provide. This systematic review evaluated the association between structural empowerment, psychological empowerment and two dimensions of burnout, depersonalization and personal accomplishment among nurses in the health care setting. Cross-sectional studies from 1990 to 2018 were searched from data bases of MEDLINE, CINAHL, EBSCO, ScienceDirect, Scopus, Springer Link, and Cochrane library, as well as unpublished studies and 35 eligible studies were found. After critical appraisal of their methodological quality, only 8 were included in the review. Cochran's Q and I square statistic was used to test the heterogeneity.

Meta-analysis results indicated a negative association between structural empowerment and depersonalization, and a positive association between structural empowerment and personal accomplishment. There was also a negative association between psychological empowerment and depersonalization, and a positive association between psychological empowerment and personal accomplishment. However, only 2-6 studies were combined in the meta-analysis for each outcome and they were of low to very low quality, so more primary studies need to be conducted to increase confidence in results and provide recommendations for policy and practice.

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Introduction

Nursing shortage is a significant issue that needs urgent intervention for healthcare organizations across the globe, and is increasingly being research, for example in China[1] and Canada.[2] The shortage of nurses accompanied with shorter length of stays in hospitals, rising average patient acute stage, and less resources provided contributes to nurses carrying greater workloads.[3] These high workloads are more likely to be associated with higher adverse effects of patient's mortality and job dissatisfaction.[4] In addition, heavy workloads and limited resources, and other daily stressors require nurses to put their energy in work, and help eventually to lead to burnout.[5]

Burnout is the psychological process interplayed among the three components which are the feeling of emotional exhaustion, depersonalization, and reducing personal accomplishment.[6] Emotional exhaustion occurs when the person feels overextended and exhausted on the job. Depersonalization is a negative, impersonal sense, or extreme detachment from the job. A situation that contributes to emotional exhaustion or depersonalization seems to erode a sense of the effectiveness of person.[6] Inefficacy reduces personal accomplishment which is developed in parallel with emotional exhaustion and depersonalization. In contrast, the third component of burnout is positive and called personal accomplishment. This refers to a person's sense of competence, achievement, and productivity at work.[1] A person who experiences a sense of personal accomplishment may have low burnout level, while a person who experiences reducing personal accomplishment may have a higher burnout level.[7, 8]

Evidence reveals that burnout is reported by nurses in a variety of clinical setting. For example, burnout was experienced by 210 nurses who worked in a hemodialysis setting in the Republic of Serbia[9], and 171 nurses who worked in nursing homes and extended care units in Croatia.[10] In the former study, 40.9% and 8.6% of high levels of emotional exhaustion, and depersonalization respectively were found, and 31.3% of low levels of personal accomplishment[9], while in the latter there was 43.9% and 22.2% of high levels of emotional exhaustion, and depersonalization respectively, and 39.8% of low levels of personal accomplishment.[10]

Burnout could be a consequence of constant exposure to stressful situations in the workplace; also a lack of autonomy, organizational support, and resources, a heavy workload, and poor management.[11] Among nurses, an important cause of burnout is stress related to working conditions.[12] Multiple environmental stressors in healthcare organizations seem to have increased. More important, burnout among nurses is found to be related to the quality of care they provide and work performance[13], patient satisfaction[11], patient safety and the reporting of mistakes[14], and work-related injuries such as needlestick injuries.[15] Furthermore, burnout has been reported to be related to psychological problems of nurses, job performance, job satisfaction, attrition rates, and relationships between nurses and their families and colleagues.[11]

Empowerment is the action through which individuals can control their own lives and the situations they encounter,[16] and it may contribute to less burnout.[1] It has been classified into two different perspectives: organizational/ structural and psychological attributes. Empowerment, both structural and psychological components, is evidently negative associated with burnout. Meng, Jin, and Gou[17] reported the negative relationship between structural empowerment and burnout ($r =-.373$, $p < .01$). Also, a negative relationship was found between psychological empowerment and burnout ($r = -.553$, $p < .01$).

According to the theory of structural empowerment of Kanter[18], attitudes and behaviours of employees are shaped by the situation and power in their organizations, where power is the ability to allocate or use resources to achieve an end. Power can be shared and accumulated and there are two types of power in an organization. Formal power refers to jobs that are constructed, considered and appreciation given to any actions that relevant to the organization goals. Informal power refers to the relationships among people within and across departments, and outside the organization. Employees who have formal and informal power can gain access to four sources of work structure that empower them to accomplish tasks: opportunity, information, support, and resources. Information includes both the formal and informal forms of knowledge that can be used to be productive in work, whilst support is useful guidance, recommendations, and feedback from sponsors, peers and subordinates. Resources refer to fiscal resources, materials, supplies, and times that will be used to achieve the organizational goals.[2,19]

Psychological empowerment refers to the psychological experiences of empowerment an employee finds at work. Psychological experience includes four dimensions: meaning, competence, self-determination, and impact.[20] Meaning is the compatibility between employee's beliefs, performances and requirements of job. Competence is the employee's confidence regarding their abilities to perform a good job.[21] Self-determination is the feelings of the employee's control over work, including initiating and continuing work processes. Finally, impact is defined as the employee's sense of being able to influence the outcomes of work at the operational, administrative, and strategic levels.[20]

Healthcare settings are places that produce a continuum of care and services for a population by healthcare providers. In recent years, global crises have forced healthcare settings to reform their structures, and this leads to greater workloads.[22] Additionally, nursing shortage and heavy workload in such settings may lead to nurses' burnout that may affect the quality of care and an intent to leave their jobs. Therefore, creating positive work environments is an important role for nursing management for these have positive impacts on performance of nurses and the quality of care they provided.[12] Structural empowerment is a method for leaders to socially engage with and empower their staff.[23] When nurses are empowered, they are more likely to experience congruence between work expectation and performance, feel their workload is reasonable, have control over their work and good relationships with their colleagues, get rewards when achieved, which are less likely to develop burnout.[12]

Our preliminary database search found a systematic review protocol focusing on the occurrence of burnout among healthcare providers including nurses who worked in palliative care units.[22] Additionally, three systematic reviews were found. The first studied the association between the shortage of nurses, job satisfaction, and stress and burnout among oncology nurses.[24] The second targeted the occurrence of burnout and related factors anesthesiology staff,[25] while the third focused on prevalence and factors related to burnout among the healthcare workforce in Arab countries.[26] Previous systematic reviews have also revealed that working and personal factors are associated with burnout and these factors included a strained working pattern,[25] gender, nationality, duration of service, hours of working, and pattern of shift .[26] In addition, we found 2 systematic reviews focusing only on empowerment on nurses. These addressed the relationship of structural and psychological empowerment[27]. Another systematic review conducted on studies across 1990-2009 evaluated nurse managers' work-related empowerment,[28] but was limited in sample size, and comparability because of different methodologies in the primary studies, and which resulted in heterogeneity. A 2018 systematic review evaluated the association between empowerment and burnout, but it evaluated only one sub-component of these, that is association between structural empowerment and emotional exhaustion.[29] Additionally, the relationship between structural and psychological empowerment and the other two dimensions, depersonalization and personal accomplishment, were omitted.

Aim and Review Questions

No recent or ongoing systematic review of the associations between structural and psychological empowerment, depersonalization, and personal accomplishment among nurses in health care settings were found based on searches of the JBI Database of Systematic Reviews and Implementation Reports, Cochrane Library, PROSPERO, MEDLINE (PubMed), and CINAHL, so we aimed to evaluate these associations with this review. The synthesized findings can serve as valid information to support decision-making for nurse managers and nursing and health policy makers to improve working conditions to prevent burnout among nurses and which will hopefully lead to good quality of care, and job satisfaction among nurses.

The specific questions of this review were: 1) What is the evidence on the association between structural empowerment and depersonalization and personal accomplishment among nurses? and 2) What is the evidence on the association between psychological empowerment and depersonalization and personal accomplishment among nurses in the healthcare setting?

Methods

This systematic review followed the process in our protocol registered in the PROSPERO (#CRD 42018106712). The details of the methodology are as follows:

Inclusion Criteria/Participants

This review considered any studies related to burnout, structural and psychological empowerment in nurses in the healthcare setting. No limits were set regarding the educational level or position titles of registered nurses (RNs), nurse manager, and nurse executives for inclusion. Nurses in non-health care settings working in university or college faculty members or nurse educators from nursing education institutes were excluded from the review.

Exposures

We considered studies that evaluated two concepts of empowerment: 1) structural empowerment comprised of formal power and informal power, opportunity, information, support, as well as resources. These studies were evaluated by instruments such as the Conditions for Work Effectiveness Questionnaire[30] and 2) psychological empowerment comprised of meaning, competence, self-determination, and impact. They were evaluated using standardized tools, for example, the Psychological Empowerment Instrument.[20]

Outcomes

The outcomes of this review were measured by relevant standardized tools, for example, but not limited to the Maslach Burnout Inventory.[6]

Contexts

This review evaluated studies undertaken in hospitals, health centres, outpatient units, primary care clinics, and nursing homes. The numbers of participants were 3,135 for the meta-analysis between structural empowerment and depersonalization, 1,502 for the meta-analysis between structural empowerment and personal accomplishment, 1,550 for the meta-analysis between psychological empowerment and depersonalization, and 1,550 for the meta-analysis between psychological empowerment and personal accomplishment.

Study Types

Studies considered to include to this review were analytical descriptive studies. These included cohort studies (both prospective and retrospective types), case-control studies, analytical cross-sectional studies (descriptive and predictive studies) which were published during January 1990-August 2018.

Search Strategy

The initial search using keywords/free-text was done with MEDLINE and CINAHL. The index terms/subject heading were identified and a full search strategy was conducted on the databases of MEDLINE, CINAHL, EBSCO, ScienceDirect, Scopus, Springer Link, and Cochrane library. Grey literature such as proceedings, a case report from an organization, and newsletters were included in the review if report findings were relevant for this review. The search for grey literature included Google Scholar, MedNar, ProQuest Dissertations and Theses, as well as reports from the World Health Organization (WHO) and the International Council of Nurses (ICN). Initial keywords used are detailed in **Table 1**. Additional studies were screened from reference list of critical appraisal studies for eligibility. The search was undertaken during July-October, 2018 with the date was used to limit the year of publication.

Study Selection

All identified citations were collated after searching across identified databases, and uploaded into the reference management software (Endnote VX.X) and duplicates removed. Titles and abstracts of 587 studies were then independently screened by two reviewers based on the inclusion criteria. Thirty-five full-text studies then assessed in detail based on the inclusion criteria and excluded with the following reasons: 27 studies were excluded due to unmet criteria related to subjects, statistics, design, and languages. Also excluded were four studies where the full-text was unavailable. A primary study that met the inclusion criteria, and had been included in a previous systematic review[29] was also selected. Our PRISMA flow diagram (**Figure 1**) shows the search and study selection process. No disagreements arose between the reviewers regarding study selection.

Table 1. Initial Keywords of Searching

search	Query
#1	Nurs*[Mesh] **OR** nursing[Mesh] **OR** person*[All Fields] **OR** "registered nurse*"[Mesh] **OR** manager*[Mesh] **OR** executive*[Mesh] **OR** administrator*[Mesh] **OR** "head nurse*"[All Fields] **OR** "charge nurse*"[All Fields] **OR** "supervisory nursing" [All Fields]
#2	Power* [Mesh]**OR** empower*[All Fields] **OR** empowerment [Mesh]**OR** "workplace empowerment" [All Fields] **OR** "staff empowerment" [All Fields] **OR** "structural empowerment" [All Fields] **OR** "psychological empowerment" [All Fields]
#3	burnout[Mesh] **OR** "job burnout" [All Fields] **or** "professional burnout" [All Fields] **OR** "occupational burnout" [All Fields] **OR** exhaustion[Mesh] **OR** stress[Mesh]
#4	Hospital* **OR** hospice* **OR** "health center*" **OR** "outpatient clinic*" **OR** "outpatient center*" **OR** "health clinic*" **OR** "primary care clinic*" **OR** "home health care*" **OR** "nursing home*" **OR** facility*
#5	#1 **AND** #2
#6	#1 **AND** #2 **AND** #3
#7	#1 **AND** #2 **AND** #3 **AND** #4
	Limits: publication date from 1990 to 2018, English language

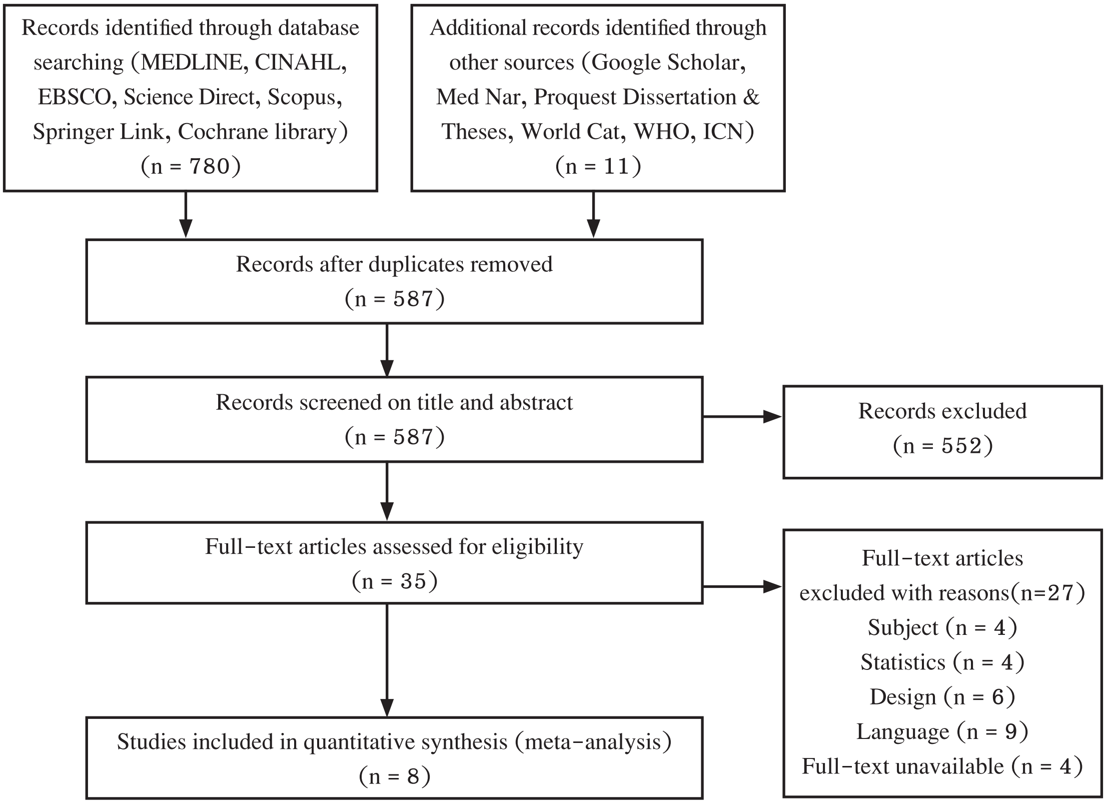


Figure 1. PRISMA Flow Diagram for the Systematic Review of Association of Structural and Psychological Empowerment with Depersonalization and Burnout

Assessment of Methodological Quality

The eight included studies were critically appraised independently by two reviewers for methodological quality using the standardized tools from the Joanna Briggs Institute[31] (Checklist for Analytical Cross-Sectional Studies) priori included the studies into the review. Studies having six out of eight of criteria were included, and following critical appraisal, eight studies met quality criteria and were included. **Appendix II** reports the result of each item of critical appraisal of included studies.

Appendix I. Description of Studies Included in Review

Authors z(year)	Research objective	Research design	Study Setting	Sample	Measures Used
1. Hatcher & Laschinger (1996)	Examine the relationship between staff nurses' perception of power and opportunity and level of burnout	Cross-sectional	One acute care teaching hospital, Ontario city, Canada	85 staff nurses	Structural empowerment CWEQ (Chandler, 1986) Burnout Human Service Survey (Maslach & Jackson, 1986)
2. Hochwalder (2007)	Explore the main effect of psychological empowerment on burnout	Cross-sectional	Three hospitals and two primary health care centers, Stockholm, Sweden	Two separated groups: 838 registered nurses and 518 assistant nurses	Psychological empowerment Spreitzer's Empowerment Scale (Spreitzer, 1995) Burnout Maslach Burnout Inventory (Maslach & Jackson, 1981)
3. Laschinger, et al. (2009)	Examine the influence of empowering work conditions and civility on nurses' experience of burnout	Cross-sectional	Five organizations, Canada	612 staff nurses	Structural empowerment Subscales of CWEQ II (Laschinger et al, 2001) Burnout subscales of Maslach Burnout Inventory-General Survey (Schaufeli et al.,1996)
4. Cavus & Demir (2010)	Examine the relationship between the level of perceived structural and psychological empowerment and the level of burnout	Cross-sectional	Two state hospitals, Turkey	194 nurses	Structural empowerment CWEQ II (Laschinger et al, 2000) Psychological empowerment Psychological Empowerment Scale (Spreitzer, 1995) Burnout Maslach Burnout Inventory Maslach et al., 1996)
5. Laschinger et al. (2010)	Test the model linkage of structural empowerment to workplace bullying and burnout	Cross-sectional	Data from longitudinal study in hospitals, Ontario, Canada	415 newly graduated nurses	Structural empowerment CWEQ II (Laschinger et al, 2000) Burnout Maslach Burnout Inventory-General Survey (Schaufeli et al.,1996)
6. Laschinger et al. (2013)	Examine the effect of authentic leadership and structural empowerment on emotional exhaustion and cynicism	Cross-sectional	Data from two studies conducted in hospitals, Ontario, Canada	342 newly graduated nurses and 273 experienced acute-care nurses	Structural empowerment CWEQ II (Laschinger et al, 2001) Burnout Maslach Burnout Inventory-General Survey (Schaufeli et al.,1996)
7. Boamah et al. (2016)	Test the model linkage of authentic leadership to structural empowerment, short staffing, and work-life interfere on burnout	Time-lagged study	Database, ten Canadian provinces.	406 newly graduated nurses	Structural empowerment CWEQ II (Laschinger et al, 2001) burnout Maslach Burnout Inventory-General Survey (Schaufeli et al.,1996)
8. Guo et al. (2016)	Explore the relationship among structural empowerment, job stress and burnout	Cross-sectional	Ten teaching hospitals, China	1002 nurses	Structural empowerment CWEQ II (Laschinger et al, 2001) Burnout Maslach Burnout Inventory (Maslach & Jackson, 1986)

Appendix II. Summary of Critical Appraisal of Included Studies

authors (year)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
1. Hatcher & Laschinger (1996)	Y	Y	Y	Y	N	N	Y	Y
2.Hochwalder (2007)	Y	Y	Y	Y	Y	Y	Y	Y
3. Laschinger, et al. (2009)	Y	Y	Y	Y	N	N	Y	Y
4.Cavus & Demir(2010)	Y	Y	Y	Y	N	N	Y	Y
5. Laschinger et al. (2010)	Y	Y	Y	Y	N	N	Y	Y
6. Laschinger et al. (2013)	Y	Y	Y	Y	Y	Y	Y	Y
7. Boamah et al. (2016)	Y	Y	Y	Y	N	N	Y	Y
8. Guo et al. (2016)	Y	Y	Y	Y	N	N	Y	Y

Appendix III. Summary of Findings

outcome	number of participants (studies)	quality of the evidence	correlation coefficient (95% CI)	Comments
depersonalization	3135 (6 studies)	very low*	-.344 (-.394 to -.291)	* Downgraded one level due to inconsistency of results (I^2=59.03%, p=.0232)
personal accomplishment	1,502 (3 studies)	very low*	.333 (.241 to .419)	* Downgraded one level due to inconsistency of results (I^2=61.93%, p=.0723)

Systematic review title: Association of Structural and Psychological Empowerment with Nurses' Burnout: a Systematic Review
Population: nurses (assistant nurses, registered nurses, nurse manager, and nurse executives)
Exposures: structural empowerment
Outcomes: depersonalization and personal accomplishment
Context: nurses in the health care setting who has burnout

Appendix IV. Summary of Findings

outcome	number of participants (studies)	quality of the evidence	correlation coefficient (95% CI)	Comments
depersonalization	1,550 (2 studies)	very low*	-.277 (-.381 to -.165)	*Downgraded one level due to inconsistency of results (I^2=78.72%, p=.0091)
personal accomplishment	1,550 (2 studies)	low	.334 (.289 to .377)	-

Systematic review title: Association of Structural and Psychological Empowerment with Nurses' Burnout: a Systematic Review
Population: nurses (assistant nurses, registered nurses, nurse manager, and nurse executives)
Exposures: psychological empowerment
Outcomes: depersonalization and personal accomplishment
Context: nurses in the health care setting who has burnout

Data Extraction

Data extraction was done independently by two reviewers using the Joanna Briggs Data Extraction Form.[31] The specific details extracted were about characteristics of the study and the results which were relevant to the questions and objectives of the review. All exposures and outcomes were continuous data and were analysed by the coefficient of the relationship using Pearson's product-moment correlation coefficient.

Data Synthesis

Research findings were pooled in statistical meta-analysis using MEDCALC statistical software. The Hedges-Olkin method is used to calculate the weighted summary correlation coefficient, and a Fisher

Z transformation is used to transform correlation coefficients.[32] Data analysis was done to calculate the combined result of correlation coefficient of included studies with the random effects model with 95% confidence intervals. Heterogeneity was assessed statistically using Cochran's Q and I^2 statistic. Cochran's Q is the weighted sum of squared deviation of each study from the actual effect estimate. It is reported with a P-value. However, in the case of small studies included in the review, it is suggested to use a P-value less than 0.10 as the cut-off for heterogeneity. This also confirms with I^2 value which ranges from 0-100% to represent the real heterogeneity rather than chance occurred across study. The higher value represented more heterogeneity[33].

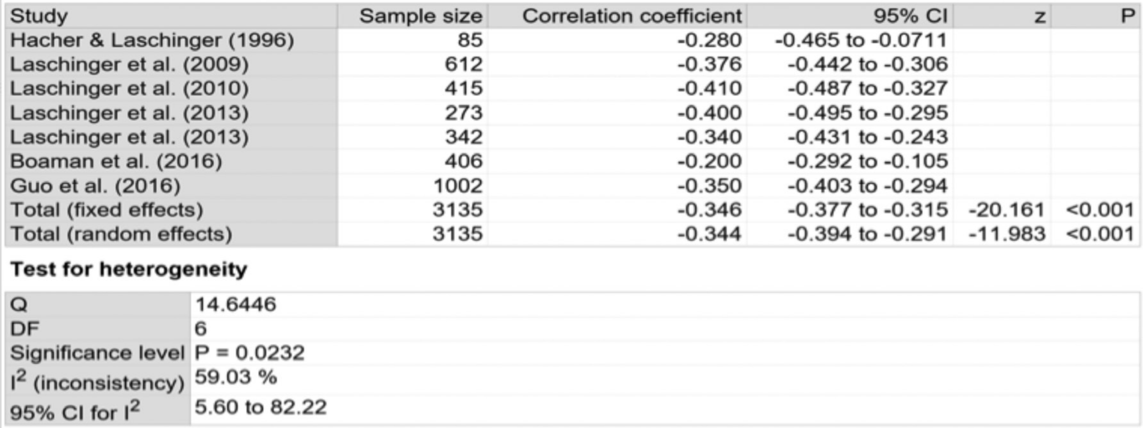
Results

Meta-analysis was used to combine eight included studies. The results were presented by each outcome as follows:

Structural Empowerment and Depersonalization

Six studies[8,34,35,36,37,38] were combined using meta-analysis. The random effects model suggested a negative correlation (the summary correlation coefficient = -.344; CI=-.394,-.291; n=3,135), however this analysis demonstrated high risk of heterogeneity of the data (I^2=59.03%, p=.0232) (**Table 2**). A forest plot shows the correlation coefficients of six studies and the overall effect with 95% CI (**Figure 2**).

Table 2: The Summary Correlation Coefficient Between Structural Empowerment and Depersonalization



Study	Sample size	Correlation coefficient	95% CI	z	P
Hacher & Laschinger (1996)	85	-0.280	-0.465 to -0.0711		
Laschinger et al. (2009)	612	-0.376	-0.442 to -0.306		
Laschinger et al. (2010)	415	-0.410	-0.487 to -0.327		
Laschinger et al. (2013)	273	-0.400	-0.495 to -0.295		
Laschinger et al. (2013)	342	-0.340	-0.431 to -0.243		
Boaman et al. (2016)	406	-0.200	-0.292 to -0.105		
Guo et al. (2016)	1002	-0.350	-0.403 to -0.294		
Total (fixed effects)	3135	-0.346	-0.377 to -0.315	-20.161	<0.001
Total (random effects)	3135	-0.344	-0.394 to -0.291	-11.983	<0.001

Test for heterogeneity

Q	14.6446
DF	6
Significance level	P = 0.0232
I^2 (inconsistency)	59.03 %
95% CI for I^2	5.60 to 82.22

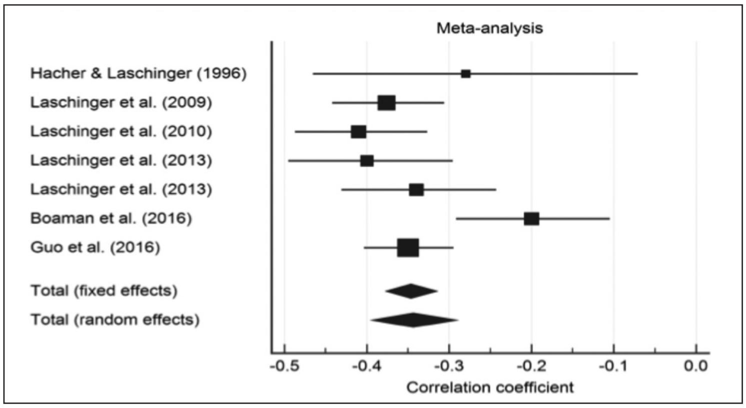


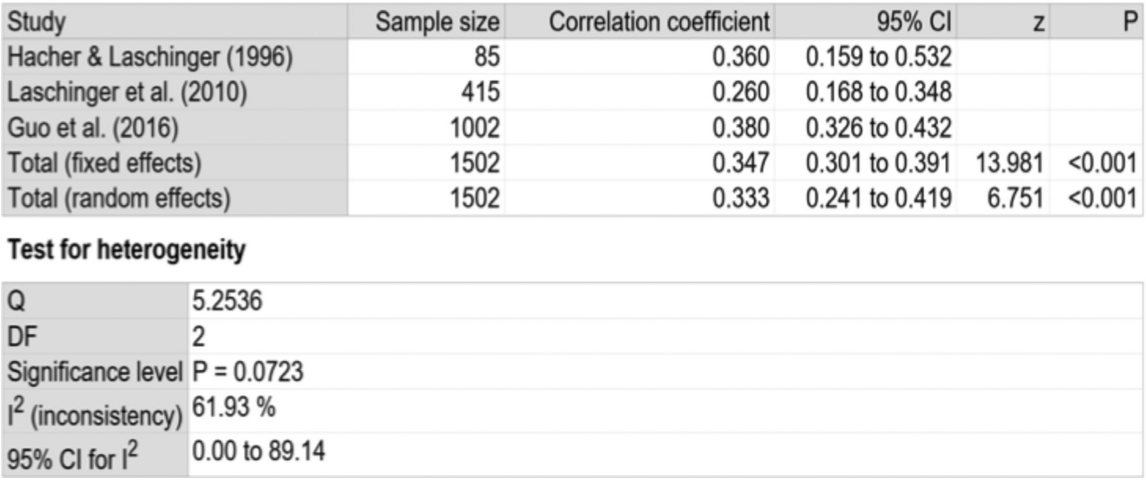
Figure 2. Forest Plot of the Correlation Coefficient of Six Studies and the Overall Effect

Forest plot shows the correlation coefficients between structural empowerment and depersonalization of six studies included in the meta-analysis, and the overall effect with 95% CI. The study of Laschinger et al. (2013) was divided into two groups: newly graduated and experienced nurses.

Structural Empowerment and Personal Accomplishment

Three studies[8,35,38] were combined using meta-analysis. The random effects model suggested a positive correlation (the summary correlation coefficient = .333; CI= .241, .419; n=1502,), however this analysis demonstrated high risk of heterogeneity of the data (I^2=61.93%, p=.0723) (**Table 3**). The correlation coefficients of three studies and the overall effect with 95% CI were showed in a forest plot (**Figure 3**).

Table 3. Summary Correlation Coefficient Between Structural Empowerment and Personal Accomplishment



Study	Sample size	Correlation coefficient	95% CI	z	P
Hacher & Laschinger (1996)	85	0.360	0.159 to 0.532		
Laschinger et al. (2010)	415	0.260	0.168 to 0.348		
Guo et al. (2016)	1002	0.380	0.326 to 0.432		
Total (fixed effects)	1502	0.347	0.301 to 0.391	13.981	<0.001
Total (random effects)	1502	0.333	0.241 to 0.419	6.751	<0.001

Test for heterogeneity

Q	5.2536
DF	2
Significance level	P = 0.0723
I^2 (inconsistency)	61.93 %
95% CI for I^2	0.00 to 89.14

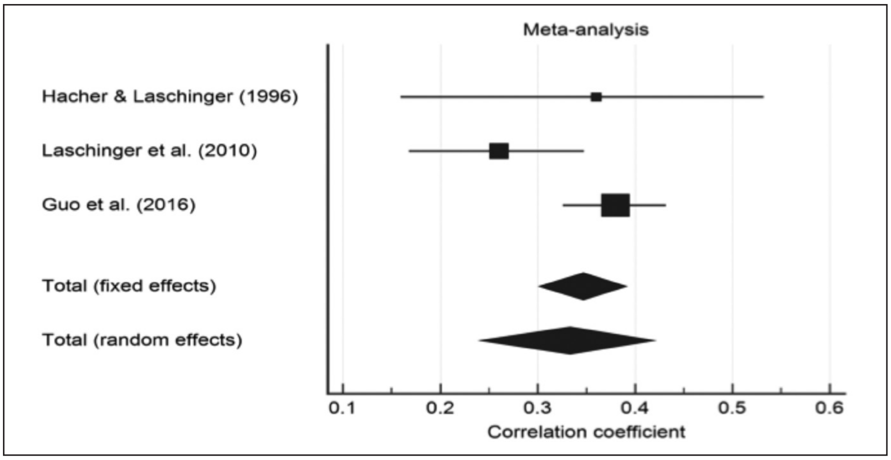


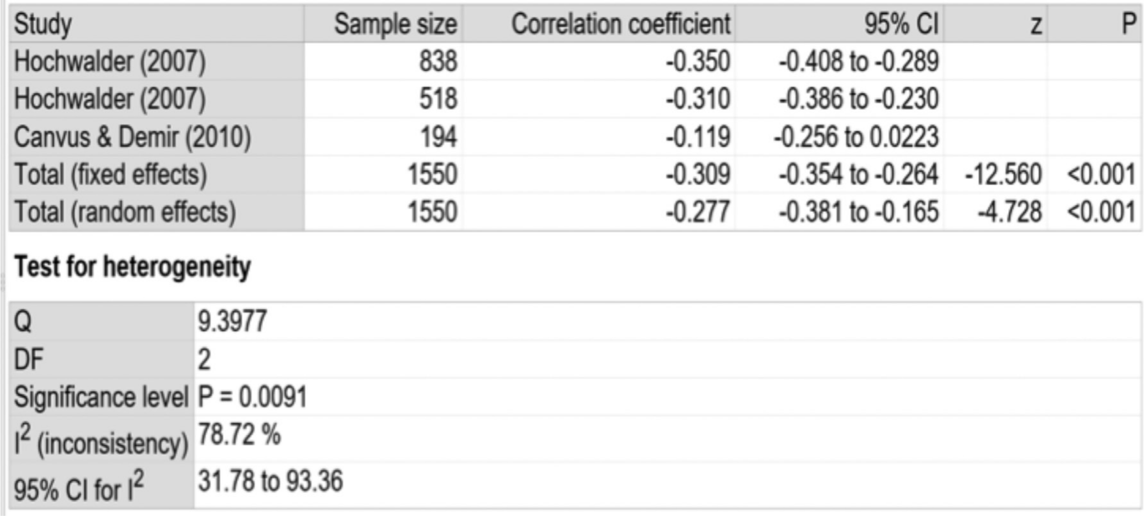
Figure 3. Forest Plot of the Correlation Coefficient of Three Studies and the Overall Effect

The correlation coefficients between structural empowerment and personal accomplishment of three studies and the overall effect of 95% CI are shown in forest plot.

Psychological Empowerment and Depersonalization

Two studies[39,40] were combined using meta-analysis. The random effects model suggested a negative correlation (the summary correlation coefficient = -.277; CI=-.381,-.165, n=1,550), however this analysis demonstrated high risk of heterogeneity of the data (I^2=78.72%, p=.0091) (**Table 4**). A forest plot of the correlation coefficients of two studies and the overall effect with 95% CI is shown in **Figure 4.**

Table 4. Summary Correlation Coefficient Between Psychological Empowerment and Depersonalization



Study	Sample size	Correlation coefficient	95% CI	z	P
Hochwalder (2007)	838	-0.350	-0.408 to -0.289		
Hochwalder (2007)	518	-0.310	-0.386 to -0.230		
Canvus & Demir (2010)	194	-0.119	-0.256 to 0.0223		
Total (fixed effects)	1550	-0.309	-0.354 to -0.264	-12.560	<0.001
Total (random effects)	1550	-0.277	-0.381 to -0.165	-4.728	<0.001

Test for heterogeneity

Q	9.3977
DF	2
Significance level	P = 0.0091
I^2 (inconsistency)	78.72 %
95% CI for I^2	31.78 to 93.36

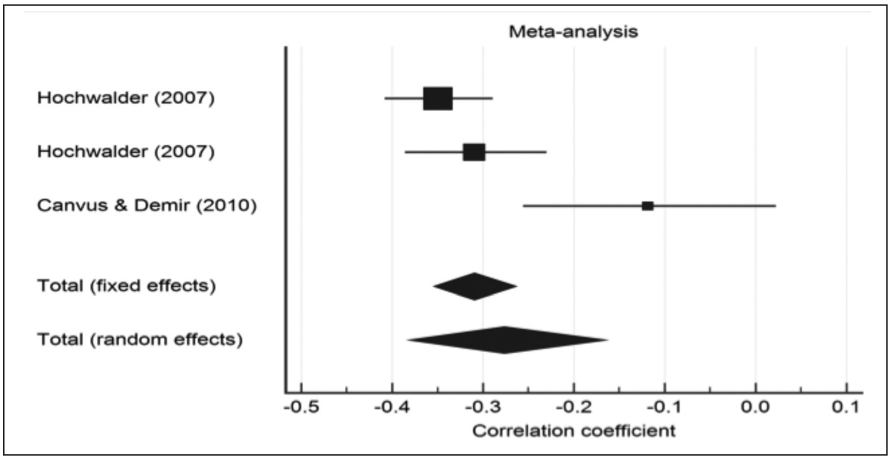


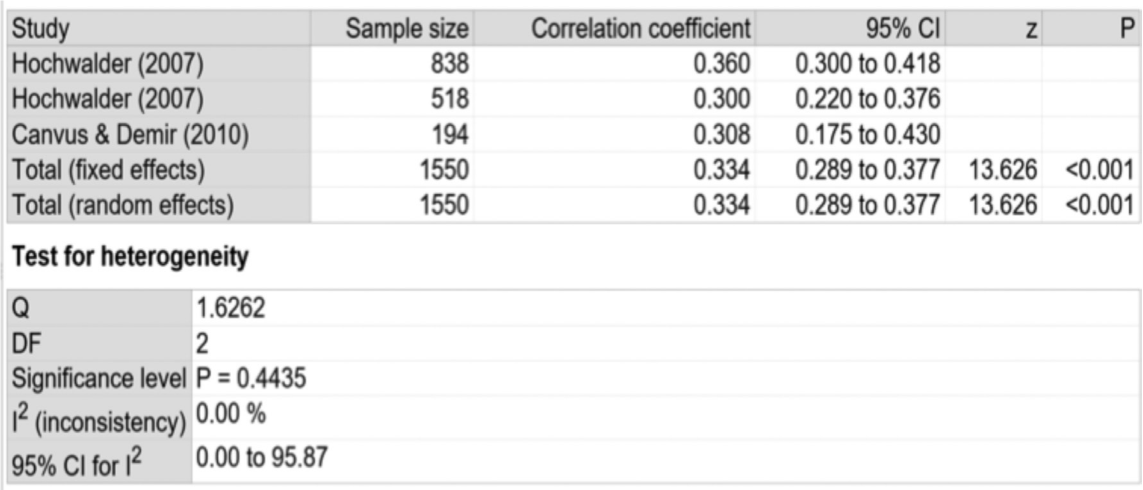
Figure 4. Forest Plot of the Correlation Coefficient of Two Studies and the Overall Effect

A forest plot of the correlation coefficients between psychological empowerment and depersonalization of two studies and the overall effect of 95% CI. Hochwalder's study (2007) was divided into two groups, registered nurses and assistant nurses.

Psychological Empowerment and Personal Accomplishment

Two studies[39,40] were combined using meta-analysis. There was no observed heterogeneity (I^2=0%, p=.4435). Under the fixed effects model, the result showed that there was a positive relationship between psychological empowerment and personal accomplishment (the summary correlation coefficient = .334; CI=.289, .377, n=1,550) (**Table 5**). A forest plot of the correlation coefficients of two studies and the overall effect with 95% CI are shown in **Figure 5**.

Table 5. Summary Correlation Coefficient Between Psychological Empowerment and Personal Accomplishment



Study	Sample size	Correlation coefficient	95% CI	z	P
Hochwalder (2007)	838	0.360	0.300 to 0.418		
Hochwalder (2007)	518	0.300	0.220 to 0.376		
Canvus & Demir (2010)	194	0.308	0.175 to 0.430		
Total (fixed effects)	1550	0.334	0.289 to 0.377	13.626	<0.001
Total (random effects)	1550	0.334	0.289 to 0.377	13.626	<0.001

Test for heterogeneity

Q	1.6262
DF	2
Significance level	P = 0.4435
I^2 (inconsistency)	0.00 %
95% CI for I^2	0.00 to 95.87

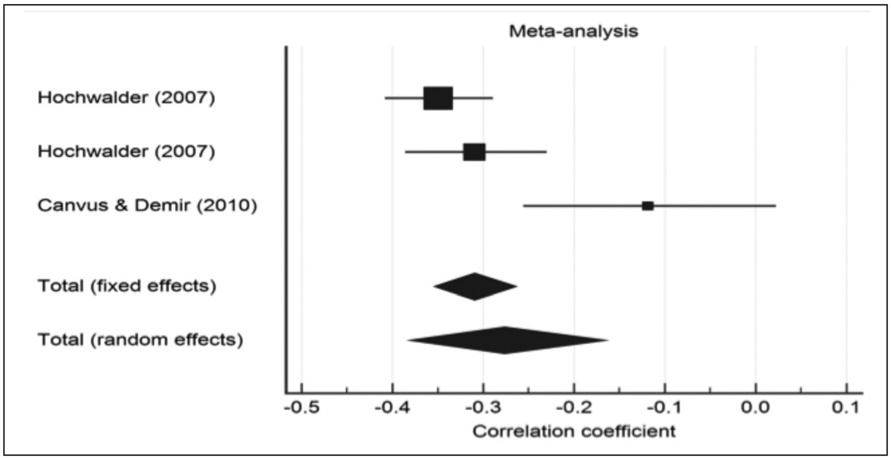


Figure 5. A Forest Plot of the Correlation Coefficient of Two Studies and the Overall Effect

A forest plot of the correlation coefficients between psychological empowerment and personal accomplishment of two studies and the overall effect with 95% CI. Hochwalder's study (2007) was divided into two groups, registered nurses and assistant nurses.

Discussion

This systematic review evaluated the association between structural empowerment, psychological empowerment and two dimensions of burnout: depersonalization and personal accomplishment. There was a total of eight studies included in the reveiw. The methodological quality of the evidence is low to very low based on the GRADE system. Meta-analysis indicated a negative relationship between structural empowerment, psychological empowerment and depersonalization, as well as a positive relationship between structural empowerment, psychological empowerment and personal accomplishment. Each association is discussed below:

Structural Empowerment and Depersonalization

This systematic review provided evidence that there is a negative relationship between structure empowerment and depersonalization. The literature treats depersonalization as a negative trait, involving the impersonal or excessively detached response to the job. Greater workloads due to the shortage of nurses and increased demands of patients as well as lack of organizational support and resource were all stressors for nurses. Once nurses experience prolonged exposure to stressful working conditions, they become exhausted, then, develop depersonalization to some extent.[36] As Leiter and Maslach[41] noted, employees experience depersonalization only when emotional exhaustion is continued for a long time. With high empowerment, feeling in control over one's work, such as having an increase in know-how and what to do, can lead to less depersonalization.[39] Moreover, one systematic review showed that depersonalization was associated with twice times increased odds of involvement of patient safety incidents among physicians.[42] Therefore, our findings encourage that depersonalization among nurses should be diminished to reduce risk to the patient and improve the quality of care.

Structural Empowerment and Personal Accomplishment

This meta-analysis indicated a positive relationship between structural empowerment and personal accomplishment. According to Leiter and Maslach[41], emotional exhaustion is considered as the significant attribute of burnout which, in the long term, leads to depersonalization and ultimately a low level of personal accomplishment which is the person's competence, achievements, and productivity at work. Improvements in structural empowerment, for example, information or knowledge and skills provision, can improve a person's competence to address problems arising on the job. In contrast, budget, materials, supplies, and times can be used to achieve the organizational goals which lead to personal accomplishment.

Psychological Empowerment and Depersonalization

Our findings indicated a negative relationship between psychological empowerment and depersonalization. As previously addressed, depersonalization is a negative, impersonal or extremely detached reaction to the job and others. Therefore, people show negative behaviours to others. Psychological empowerment enables nurses to feel confident regarding their abilities to do their job and a sense of influencing the outcomes of their own work[20], which subsequently enables a person to initiate and continue work processes. As a result, exhaustion and depersonalization are decreased.

Psychological Empowerment and Personal Accomplishment

The findings indicated that there was a positive relationship between psychological empowerment and personal accomplishment. An opportunity and resource provision from the organization, as well as social support, that is guidance and feedback from sponsors, peers, and subordinates, can enhance nurses' feelings of control over their work and increase their psychological empowerment. This was supported by a systematic review which found structural empowerment to be moderately related to psychological empowerment.[29] When nurses experience psychological empowerment at work, either the meaningfulness, competence, self-determination, or the impact that they have toward their own work, they are confident and can control their work, and enhance personal accomplishment.

Limitations and Recommendations of the Review

Our review found few available studies that could be included in this meta-analysis and most were studies from western countries that had nuances on work situation, norm, and culture across the workplace which might impact the perception of structural and psychological empowerment, as well as depersonalization and personal accomplishment among nurses. Although the meta-analysis found the relationship between variables, statistical heterogeneity was significantly presented both from Cochran's Q and I^2 statistic. According to Tufanaru[43], studies that are similar in terms of PICO as well as context, study designs and risk of bias could be combined in the meta-analysis. This meta-analysis had similar study designs (correlational study), exposure (structural and psychological empowerment), outcomes (depersonalization and personal accomplishment), and setting (hospitals). However, participants of some studies[35,36] had different characteristics with other studies. They were new nurses who may be not good representatives of population in that they may have different perceptions of depersonalization, personal accomplishment and empowerment. This may lead to the heterogeneity of studies which may also result from a small number of studies included. Although the random effect model was applied to combine the results and yielded to the significant of the relationship among targeted variables, the heterogeneity found in the review is an issue requiring concern. Moreover, studies included in this review ranged from a low to a very low of quality based on GRADEing system.[44] They were downgraded because all studies were observational or non-experimental research type studies, had heterogeneity of data, and each of the outcomes did not produce large effects. Therefore, the certainty of the evidence is a big challenge and we cannot make any recommendations regarding the contribution of this meta-analysis to policy and practice. Critically, more primary research studies that test the causal relationship between structural, psychological empowerment interventions and burnout are strongly recommended to strengthen the evidence before any recommendation can make for clinical practice and policymaking.

Conclusion

This systematic review found that structural and psychological empowerment had negative relationship with depersonalization. In contrast, they had positive relationship with personal accomplishment. Although the results add to a body of knowledge for relationship between two variables, we cannot recommend them yet for use in policy and practice due to the heterogeneity and the low to very low quality of evidence included in this meta-analysis. However, structural empowerment and psychological experiences can positively influence the environment for nurses and should be enhanced. Moreover, reducing depersonalization and improving personal accomplishment should be done in all healthcare settings in order to improve job satisfaction and quality of care.

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Contributions

Study Design: KA, PT
Data Collection and Analysis: KA, PT
Manuscript Writing: KA, PT

References

1. Meng L, Liu Y, Liu H, Hu Y, Yang J, Liu J. Relationships among structural empowerment, psychological empowerment, intent to stay and burnout in nursing field in mainland China-based on a cross-sectional questionnaire research. Int J Nur Pract. 2015 213: 303-12.
2. Lucas V, Laschinger HK, Wong CA. The impact of emotional intelligent leadership on staff nurse empowerment: the moderating effect of span of control. J Nurs Manage. 2008 16(8): 964-73.
3. Vahey DC, Aiken LH, Sloane DM, Clarke SP, Vargas D. Nurse burnout and patient satisfaction. Med Care. 2004 42 (2 Suppl): II57-66.
4. Aiken LH, Clarke SP, Sloane DM, Sochalski J, Siber JH. Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. JAMA2002 288:1987-93
5. Boudrias JS, Morin AJ, Brodeur MM. Role of psychological empowerment in the reduction of burnout in Canadian healthcare workers. Nurs Health Sci. 2012 4(1): 8-17.
6. Maslach C, Schaufeli W., Leiter M. Job burnout. Annu Rev Psychol. 2001 521: 397-422.
7. Nogueira LS, Sousa RMC, Guedes ES, Santos MAD, Turrini RNT, Cruz DALMD. Burnout and nursing work environment in public health institutions. Rev Bras Enferm. 2018 71(2):336-342. doi: 10.1590/0034-7167-2016-0524.
8. Hatcher S, Laschinger HKS. Staff nurses› perceptions of job empowerment and level of burnout: a test of Kanter›s theory of structural power in organizations. Can. J. Nurs. Adm. 1996 9(2): 74-94.
9. Trbojević-Stanković J, Stojimirović B, Soldatović I, Petrović D, Nesić D, Simić S. Work-related factors as predictors of burnout in Serbian nurses working in hemodialysis. Nephrol Nurs J. 2015 42(6):553-61; quiz 562.
10. Neuberg M, Železnik D, Meštrović T, Ribić R, Kozina G. Is the burnout syndrome associated with elder mistreatment in nursing homes: results of a cross-sectional study among nurses. Arh Hig Rada Toksikol. 2017 68(3):190-197. doi: 10.1515/aiht-2017-68-2982.
11. O'Brien JL. Relationships among structural empowerment, psychological empowerment, and burnout in registered staff nurses working in outpatient dialysis centers. Nephrol Nurs J. 2011 38(6):475-81; quiz 482.
12. Laschinger HK, Wong, CA, Greco, P. The impact of staff nurse empowerment on person-job fit and work engagement/burnout. Nurs Admin. 2006 30(4): 358-67.
13. Bogaert VP, Clarke S, Willems R, Mondelaers M. Nurse practice environment, workload, burnout, job outcomes, and quality of care in psychiatric hospitals: a structural equation model approach. J Adv Nurs. 2013 69(7):1515-24.
14. Halbesleben JRB, Wakefield BJ, Wakefield DS, Cooper LB. Nurse burnout and patient safety outcomes nurse safety perception versus reporting behavior. West J Nurs Res. 2008 305:560-77.
15. Clarke SP, Sloane DM, & Aiken LH. Effects of hospital staffing and organizational climate on needlestick injuries to nurses. Am J Public Health. 2002 92(7): 1115-9.
16. Oxford Learner's Dictionaries. Empowerment [internet]. Oxford University Press [Cited 2018 Mar 12]. Available from http://www.oxfordlearnersdictionaries.com/definition/english/empowerment?q=empowerment.
17. Meng L, Jin Y, Guo J. Mediating and/or moderating roles of psychological empowerment. Appl Nurs Res. 2016 30:104-10
18. Kanter RM. Men and Women of the Corporation. New York: Basic Books; 1977
19. Kanter RM. Power failure in management circuits. Harv Bus Rev. 1979 57: 65-75.
20. Spreitzer GM. Psychological empowerment in the workplace: dimensions, measurement, and validation. Acad Manage J, Psychol Rev 38(5): 1442-65.
21. Bandura A. Self-efficacy: towards a unifying theory of behavioral change. Psychol Rev. 1977 84 (2): 191-215.
22. Parola V, Coelho A, Cardoso D, Gea-Sanchez M, Blanco-Blanco J, Apo´ stolo J. The prevalence of burnout in health professionals working in palliative care: a systematic review protocol. JBI Database System Rev Implement Rep. 2016: 45-50.
23. Greco P, Laschinger HK, Wong C. Leader empowering behaviours, staff nurse empowerment and work engagement/burnout. Nurs Leadersh. 2006 9(4): 41-56.
24. Toh SG, Ang E, Devi, MK. Systematic review on the relationship between the nursing shortage and job satisfaction, stress and burnout levels in oncology/haematology settings. Int J Evid Based Healthc. 2012 10:126-141.
25. Sanfilippo F, Noto A, Foresta G, Santonocito C, Palumbo GJ, Arcadipane A, et al. Incidence and factors associated with burnout in anesthesiology: A systematic review. Biomed Res Int. 2017: 1-10.

26. Elbarazi I, Loney T, Yousef S, Elias A. Prevalence of and factors associated with burnout among health care professionals in Arab countries: a systematic review. BMC Health Serv Res. 2017 17: 491.
27. Wagner JIJ., Cummings G, Smith DL, Olson J, Anderson L, Warren S. The relationship between structural empowerment and psychological empowerment for nurses: a systematic review. J Nurs Manag. 2010 18: 448–62.
28. Trus M, Razbadauskas A, Doran D, & Suominen T. Work-related empowerment of nurse managers: A systematic review. Nurs Health Sci. 2012 14: 412–20.
29. Zhang X, Ye H, & Li Y. Correlates of structural empowerment, psychological empowerment and emotional exhaustion among registered nurses: A meta-analysis. Appl Nurs Res. 2018 42: 9-16.
30. Laschinger HK, Finegan J, Shamian J, Wilk P. Impact of structural and psychological empowerment on job strain in nursing work setting: expanding Kanter›s model. J Nurs Adm. 2001 31(5): 260-72.
31. The Joanna Briggs Institute. Joanna Briggs Institute Reviewers′ Manual: The Joanna Briggs Institute; 2018 [cited 2018 Oct 2]. Available from: https://wiki.joannabriggs.org/display/MANUAL/Joanna+Briggs+Institute+Reviewer's+Manual
32. Hedges, LV, Olkin , I. Statistical methods for meta-analysis. London: Academic Press; 1985.
33. Higgins JPT, Thompson SG, Deeks JJ, & Altman DG. Measuring inconsistency in meta-analyses. BMJ. 2003 327: 557-560.
34. Laschinger SHK, Leiter M, Day A, Gilin D. Workplace empowerment, incivility, and burnout: impact on staff nurse recruitment and retention outcomes. J Nurs Manag. 2009 17:302-11. doi: 10.1111/j.1365-2834.2009.00999.x.
35. Laschinger HK, Grau AL, Finegan J, Wilk P. New graduate nurses› experiences of bullying and burnout in hospital settings. J Adv Nurs. 2010 66(12):2732-42. doi: 10.1111/j.1365-2648.2010.05420.x.
36. Laschinger HK, Wong CA, Grau AL. Authentic leadership, empowerment and burnout: a comparison in new graduates and experienced nurses. J Nurs Manag. 2013 21(3):541-52. doi: 10.1111/j.1365-2834.2012.01375.x.
37. Boamah SA, Read EA, Laschinger SHK. Factors influencing new graduate nurse burnout development, job satisfaction and patient care quality: a time-lagged study. J Adv Nurs. 2016 73(5):1182-1195. doi: 10.1111/jan.13215.
38. Guo J, Chen J, Fu J, Ge X, Chen M, Liu Y. Structural empowerment, job stress and burnout of nurses in China. Appl Nurs Res. 2016 31:41-5. doi: 10.1016/j.apnr.2015.12.007.
39. Hochwälder J. The psychosocial work environment and burnout among Swedish registered and assistant nurses: The main, mediating, and moderating role of empowerment. Nursing and Health Sciences. 2007 9: 205–211.
40. Çavus MF, Demir Y. The Impacts of Structural and Psychological Empowerment on Burnout: A Research on Staff Nurses in Turkish State Hospitals. Canadian Social Science. 2010 6(4): 63-72.
41. Leiter MP, & Maslach C. Areas of worklife: a structured approach to organizational predictors of job burnout. In Research in Occupational Stress and Wellbeing in Perrewe PL, Ganster, D.C. (eds), Emotional and Physiological Processes and Positive Intervention Strategies. Oxford: JAI Press/Elsevier; 2004 pp.91–134.
42. Panagioti M, Geraghty K, Johnson J, Zhou A, Panagopoulou E, Chew-Graham C, et al. Association between physician burnout and patient safety, professionalism, and patient satisfaction: A systematic review and meta-analysis. JAMA Intern Med. 2018 178(10):1317-1330. doi: 10.1001/jamainternmed.2018.3713.
43. Tufanaru C, Munn Z, Stephenson M, Aromataris E. Fixed or random effects meta-analysis? Common methodological issues in systematic reviews of effectiveness.Int J Evid Based Healthc. 2015 13(3):196-207. doi: 10.1097/XEB.0000000000000065.
44. Gordon H Guyatt, Andrew D Oxman, Regina Kunz, Gunn E Vist, Yngve Falck-Ytter, Holger J Schünemann and for the GRADE Working Group. What is "quality of evidence" and why is it important to clinicians? BMJ 2008 336:995-8 doi:10.1136/bmj.39490.551019.BE

ความสัมพันธ์ระหว่างการเสริมสร้างพลังอำนาจเชิงโครงสร้างและการเสริมสร้างพลังอำนาจด้านจิตใจกับการลดค่าความเป็นบุคคลในผู้อื่น และความรู้สึกประสบความสำเร็จ: การทบทวนวรรณกรรมอย่างเป็นระบบ

*กุลวดี อภิชาติบุตร ภัทราภรณ์ ทุ่งปันคำ**

บทคัดย่อ: ความเหนื่อยหน่ายพบได้มากในพยาบาลและส่งผลกระทบต่อคุณภาพการดูแล การทบทวนวรรณกรรมอย่างเป็นระบบครั้งนี้เป็นการประเมินความสัมพันธ์ระหว่างการเสริมสร้างพลังอำนาจเชิงโครงสร้างและการเสริมสร้างพลังอำนาจด้านจิตใจกับการลดค่าความเป็นบุคคลในผู้อื่น และความรู้สึกประสบความสำเร็จของพยาบาลที่ปฏิบัติงานในสถานบริการสุขภาพ โดยสืบค้นงานวิจัยแบบภาคตัดขวางจากฐานข้อมูล MEDLINE, CINAHL, EBSCO, ScienceDirect, Scopus, and Springer Link, และ Cochrane Library และเอกสารที่ไม่ได้ตีพิมพ์เผยแพร่ระหว่างปี ค.ศ. 1990 จนถึง 2018 พบงานวิจัยที่มีคุณสมบัติตามที่กำหนด 35 ฉบับ โดยมีเพียง 8 ฉบับที่เป็นไปตามเกณฑ์การประเมินคุณภาพและนำเข้ามาใช้ในการวิเคราะห์แบบเมต้า ตรวจสอบความแตกต่างของแต่ละงานวิจัยโดยใช้สถิติ Cochran's Q and I square ผลการการวิเคราะห์ข้อมูลโดยการทำเมต้า พบว่าการเสริมสร้างพลังอำนาจเชิงโครงสร้างมีความสัมพันธ์ทางลบกับการลดค่าความเป็นบุคคลในผู้อื่น ในขณะที่มีความสัมพันธ์ทางบวกกับความรู้สึกประสบความสำเร็จ นอกจากนี้ยังพบว่า การเสริมสร้างพลังอำนาจด้านจิตใจมีความสัมพันธ์ทางลบกับการลดค่าความเป็นบุคคลในผู้อื่น ในขณะที่มีความสัมพันธ์ทางบวกกับความรู้สึกประสบความสำเร็จ ผลการศึกษาเป็นข้อมูลสนับสนุนการตัดสินใจ อย่างไรก็ตาม เนื่องจากมีการศึกษาเพียง 2 ถึง 6 การศึกษาที่ถูกรวมเข้าไปในการวิเคราะห์เมต้า และมีคุณภาพในระดับต่ำและต่ำมาก จึงมีความจำเป็นที่ต้องมีการทำวิจัยในเรื่องเหล่านี้มากขึ้นเพื่อเพิ่มความเชื่อมั่นให้แก่ผลการวิจัยและสามารถให้ข้อเสนอแนะในการปฏิบัติและในเชิงนโยบายได้

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A Causal Model of Parenting Stress Among First–Time Adolescent Mothers

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Abstract: Parenting stress affects maternal function and psychological health and development of their child. To prevent or minimize stress among adolescent mothers, understanding how various factors work to influence stress is necessary. Thus, this study aimed to develop and test a causal model of parenting stress in first-time adolescent mothers. A total of 253 first-time postpartum adolescent mothers accessing health services for checking up were recruited from nine hospitals in a northern province in Thailand. Nine instruments were used to collect data: the Parental Distress Subscale of the Parenting Stress Index/Short Form, the Modified Knowledge of Child Development Inventory, the Self-Perception of the Parenting Role Scale, the Parenting Sense of Competence Scale, the Revised Thai Multi-dimensional Scale of Perceived Social Support, the Family Economic Strain Scale, the Kansas Marital Satisfaction Scale, the Child-rearing Conflict Measure, and the What My Baby is Like Questionnaire. Data were analyzed using descriptive statistics, Pearson's product moment correlation, and path analysis with LISREL.

The causal model of parenting stress obtained the best fit with the data. This model could explain 75% of the total variance in parenting stress. Social support, parenting attitude and self-efficacy, and child temperament influenced parenting stress directly. Social support, marital satisfaction, economic strain, child-rearing conflict, and parenting knowledge, attitude, and self-efficacy also indirectly influenced parenting stress. Nurses should design the program for preventing parenting stress in first-time adolescent mothers by emphasis on promoting positive parenting attitude and perceiving adapted child temperament, enhancing parenting self-efficacy and social support.

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Introduction

The adolescent birth rate has emerged as a growing concern worldwide. Globally, the adolescent birth rate in 2018 was 44 per 1,000 women aged 15–19.[1] For South–East Asia, the average adolescent birth rate between 2005–2016 was 33.3 per 1,000

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women aged 15-19.[1] In Thailand, the adolescent birth rate was 44.8 per 1,000 women aged 15-19 in 2015 and 42.5 in 2016.[2] In response to a national adolescent birth rate higher than the regional average in South-East Asia, and in accord with Sustainable Development Goals (SDGs), in 2016 the government of Thailand proposed legislation intended to halve the teenage pregnancy rate by 2026.[3]

Becoming a first-time adolescent mother can be a complicated, stressful process because of concurrent developmental and parenting tasks.[4] Adolescent mothers continue to form their own identity while adapting to a maternal role; this contributes to greater parenting stress compared to adult mothers.[5] First-time adolescent mothers may lack the capacity to understand complex issues and feel compassion towards their child, causing parenting stress.[4] Further, most adolescent pregnancies are unplanned and punctuated by inappropriate maternal preparation and inadequate antenatal care,[5] conditions which may induce parenting stress.

Parenting stress occurs when the perceived demands of parenting are discordant with the available resources for child care.[6] This stress negatively affects parental functioning, contributing to poor parenting strategies and behaviors, and negative parent-child interaction and relationship.[7] Decreased confidence in child raising and a negative sense of motherhood can also lead to disrupted maternal role identity formation.[8] Adolescent mothers with parenting stress tend to be careless with child care, use violent behaviors or abandon infant cues and needs.[9] A study revealed that mothers with greater parenting stress were less involved with their infants and used more punitive parenting behaviors.[9] The resulting improper care can lead to child behavior problems, delayed child development, and the activation of a negative parent-child interaction cycle that will in turn increase parenting stress.[9] Parenting stress also directly affects parents' psychosocial health and may cause postpartum depression.[10] Thus, adolescent mothers with parenting stress are at risk of delayed maternal role identity formation and postpartum depression leading to improper child development and behavior problems.

Parenting stress can occur at any postpartum stage. A woman learns to become a mother within her social system context.[8] During the first few months, she must gradually integrate the maternal role into her lifestyle and be less beholden to the social system context; eventually achieving maternal identity approximately four months postpartum.[8] Therefore, the stage after giving birth to the first few months of maternal identity formation is a critical period that can induce stress for mothers, especially first-time adolescent mothers. Adolescent mothers needing to satisfy both developmental and parental tasks may experience frustration and stress.[4]

To prevent or reduce parenting stress, influencing factors must be explicitly examined. Most studies of factors influencing parenting stress in adolescent mothers have been conducted at more than four months postpartum, with a few studies undertaken at 4-6 weeks postpartum. Models of parenting stress in adolescent mothers at more than four months postpartum may not satisfactorily explain the parenting stress of first-time adolescent mothers at 4-6 weeks postpartum. Investigation of how specific factors influence parenting stress at 4-6 weeks postpartum is needed. Thus, this study aimed to develop and test a causal model of parenting stress among Thai adolescent first-time mothers at 4-6 weeks postpartum. The findings will benefit nurses in developing effective programs to prevent or minimize parenting stress, help adolescent mothers better adapt and achieve maternal role identity, and promote effective parenting.

Review of Literature and Theoretical Framework

Abidin[11] and Belsky[12]proposed the Parenting Stress Model, identifying three domains of determinants of parenting stress including parent characteristics (such as personality, beliefs, self–confidence, attachment to the child, and psychological well–being), contextual characteristics (such as social networks and the family interactional context and conflict), and child characteristics (such as temperament and pro–social and problem behaviors). Based on Abidin's model and literature review, factors frequently found to relate to parenting stress in adolescent mothers include cognitive readiness for parenting and parenting self–efficacy.[13–18] Moreover, social support, marital satisfaction, economic strain, and child–rearing conflict, as well as child temperament, were reported as parenting stress associates.[18–28]

Cognitive readiness for parenting encompasses parenting knowledge and attitude towards parenting.[14] Parenting knowledge refers to an understanding of child development and appropriate parenting practices that affects how mothers raise their child.[15] Greater parenting knowledge associates with more sensitive parenting, a positive sense of parenting and emotional development in children,[16] and less parenting stress.[13] Parenting attitude refers to the internal state of an individual that reacts favorably or unfavorably toward parenting.[17] Mothers with positive parenting attitude tend to prepare themselves for the parenting role better, which helps them approach child–rearing situations with less stress.[17]

Parenting self–efficacy refers to a parent's confidence in their ability to perform or manage tasks related to parenting.[13] When mothers have a high level of parenting self–efficacy, they may perform or manage child–rearing activities and respond to the child's needs well.[13] A study found that the parenting self–efficacy of young African–American mothers negatively correlated with parenting stress.[13] Similarly, in Thailand, parenting self–efficacy was a significant predictor of parenting stress in adolescent mothers.[18]

Social support is a contextual characteristic that refers to the perceived help available to a person from friends, family, and significant others.[19] Social support enables adolescent mothers to share their experiences, doubts, and frustrations with others during pregnancy and child–rearing, which allows them to be more relaxed and attached to their child.[20] Social support improves parenting knowledge and self–efficacy, and perceiving adapted child temperament.[21] A study found that social support negatively associated with and predicted parenting stress in adolescent mothers.[22]

Marital satisfaction, another contextual characteristic, is a subjective experience of one's happiness and contentment with the marital relationship.[23] Unsatisfying marriages contribute to emotional stress, and mothers unsatisfied with their marital relationship are more stressed in life.[24] They tend to face economic hardship because they may not receive tangible support from the child's father or family, and a study revealed a negative relationship among marital satisfaction, economic strain, and parenting stress in adolescent mothers.[24]

Economic strain refers to a perception of the adolescent mother regarding the current financial situation including the adequacy of financial resources, financial concerns and worries, and expectations regarding the future economic situation.[25] It was found that economic strain contributed to parenting stress in adolescent mothers.[25] Child–rearing conflict refers to disagreement or discord related to child–rearing between the mothers and persons who help them raise a child.[26] In Thailand, after giving birth, adolescent mothers usually live and raise their child at either their own parents' home or partner's home. Therefore, their mothers or mothers–in–law participate in child–rearing, and differences in opinion regarding child–rearing may cause conflict and result in parenting stress.[24,26]

Child temperament encompasses how a child is perceived by others. A child's temperament may be perceived as easy, shy, slow to warm up, difficult, or challenging.[27] Child temperament characteristics can affect the interaction between mother and the child. Difficult children tend to show negative moods, non-adaptability, high reactivity, strong emotional intensity, and are highly demanding that cause parenting stress.[27] Previous findings indicate that parental perception of child difficulty is positively associated with and predictive of parenting stress. [18,28]

All the aforementioned factors influencing parenting stress in adolescent mothers at late postpartum may also influence parenting stress at 4-6 weeks postpartum. From a literature review, factors affecting parenting stress in first-time adolescent mothers at 4-6 weeks postpartum were less evidently known. Therefore, developing a causal model of parenting stress is necessary to enhance better understanding of the manageable influencing factors that directly and indirectly affect parenting stress among first-time adolescent mothers. The hypothesized model of the Model of Parenting Stress in Adolescent Mothers (MPS-AM), which was based on the Parenting Stress Model of Abidin[11] and the literature reviews, depicting the interrelationship of factors influencing parenting stress of first-time adolescent mothers is shown in **Figure 1.**

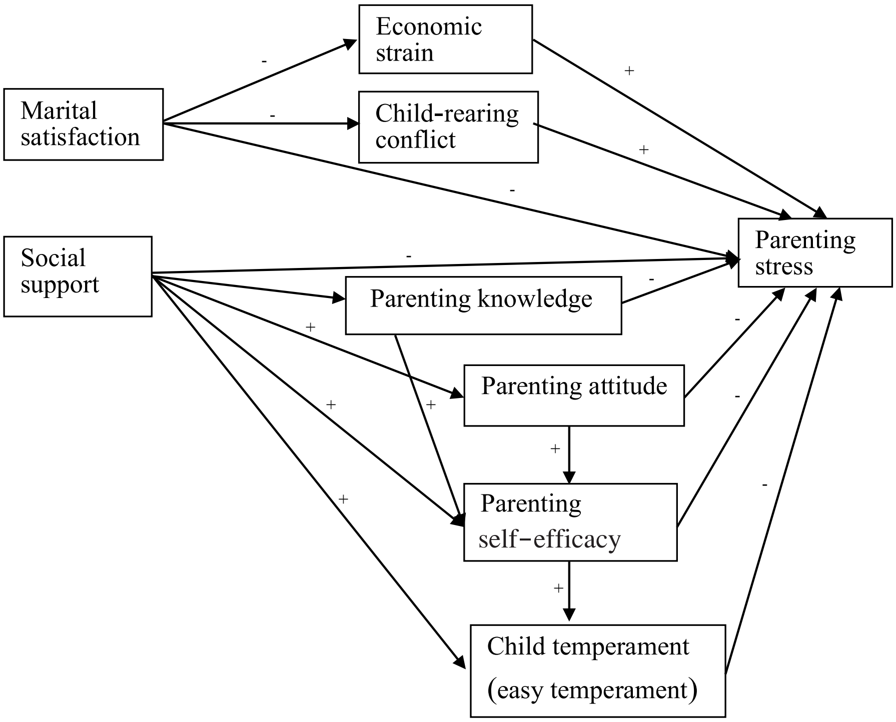

Figure 1: The hypothesized model of the Model of Parenting Stress in Adolescent Mothers (MPS-AM).

Methods

Design: This study used a correlation model testing design.

Sample: The sample included first-time adolescent mothers receiving postpartum health check-up at nine hospitals in one province of northern Thailand. The participants were selected based on the following inclusion criteria: 1) being at 4-6 weeks postpartum period; 2) having a full-term, healthy baby; and 3) being able to understand Thai language. The exclusion criteria included having any complications during delivery and postpartum periods, and not taking any part in raising their child.

The sample size was determined using a general rule of thumb recommending the minimum sample size of 200 or 5-20 times the number of parameters.[29] In this study, there were 26 estimated parameters (calculated from 17 loadings of the nine observed variables plus nine measurement errors). Thus, the sample size was 253 (5-20 participants per estimated parameter).[29]

Ethical Considerations: Ethical approval was granted by the Research Ethics Committee at the Faculty of Nursing, Chiang Mai University (approval - FULL: 004-2016) and the nine hospitals. Ethical considerations, including the nature and processes of the study, anonymity and confidentiality issues, voluntary involvement, and the right to withdraw at any time without repercussions, were explained to all eligible potential participants. When mothers agreed to participate, they were asked to sign a consent form. The informed consent of participants younger than 18 years of age was granted by their parents along with their assent.

Instruments: Nine instruments were used to collect data. Five translated instruments were used to collect data with permission. Four instruments, the Knowledge of Child Development Inventory (KIDI), the Self-Perception of the Parenting Role scale (SPPR), the Family Economic Strain Scale (FESS), and the Child-Rearing Conflict Measure, were translated into Thai with permission by the primary investigator (PI) using the back-translation technique[30], with accuracy testing done by two bilingual experts. Discrepancies in the translated instruments were then identified and adjustments made. The content validity of the four instruments was tested by six experts, including three obstetric nursing and three pediatrics nursing experts. The content validity index (CVI), the examples of items, and reliability of the instruments are shown in **Table 1**. All instruments are described below.

Table 1 Validity, reliability and sample of item of the instruments

Instruments and sample items	**CVI**	**Cronbach's alpha coefficient**	
		Preteststudy (n=10)	**actual study (n=253)**
Parental Distress Subscale of the Parenting Stress Index/Short Form (PSI-SF)*	-	.86	.89
Modified Knowledge of Child Development Inventory (M-KIDI): "Newborn babies recognize stories and music they heard before they were born." "Four-month-olds lying on their stomach start to lift their heads."	.97	.79	.88
Self-Perception of the Parenting Role scale (SPPR): "Being a parent is a satisfying experience to some adults BUT for other parents, being a parent is not all that satisfying."	1.00	.81	.86
Parenting Sense of Competence Scale (PSOC): "Some parents have clear ideas about the right and wrong ways to rear children."	-	.84	.83
Revised Thai Multi-dimensional Scale of Perceived Social Support (the Revised MSPSS): "My family really tries to help me."	-	.80	.93
Family Economic Strain Scale (FESS): "I experience money problems"	1.00	.83	.86

Table 1 Validity, reliability and sample of item of the instruments (Cont.)

Instruments and sample items	CVI	Cronbach's alpha coefficient	
		Preteststudy (n=10)	**actual study (n=253)**
Kansas Marital Satisfaction Scale (KMSS): "How satisfied are you with marriage?"	-	.82	.88
Child-Rearing Conflict Measure: "How often disagreements occurred with your parent over how to take care of the baby."	1.00	.85	.82
What My Baby is Like Questionnaire (WBL): " How difficult it is to calm your baby?"	-	.82	.82

Note: * the copyright owner did not allow publishing of any item here.

The Personal Data Profile Form was developed by the principal investigator (PI) for gathering personal data such as age, education, socio-economic status, pregnancy intention, prior experience of child-rearing, and receipt of knowledge or training for parenting during pregnancy and postpartum.

The Parental Distress Subscale of the Parenting Stress Index/Short Form (the PD subscale of the PSI-SF), Thai version, was used to measure parenting stress. The PSI-SF was developed by Abidin[11] and translated into Thai by Psychological Assessment Resources Inc. (PAR). The PD subscale of the PSI-SF consists of 12 Likert-type items with five points responses ranging from 1 (strongly disagree) to 5 (strongly agree). The possible scores range from 12 to 60, with a higher score indicating higher perceived parenting stress.

The Modified Knowledge of Child Development Inventory (M-KIDI), Thai version, was used to assess parenting knowledge. The original KIDI was developed by MacPhee[15] and consisted of 58 items. The PI translated the KIDI into Thai and modified for appropriate use within the context of the study. The M-KIDI, Thai version, consists of 37 items. The first 26 items ask participants to indicate whether they agree, disagree or are unsure about normative child behavior. The other 11 items ask participants to indicate whether they agree, disagree or are unsure about the developmental milestones of the child. If they disagree, they must indicate whether a younger or older child would be able to achieve that developmental milestone. The number of correct answers was taken to produce a total score. The possible score ranges from 0 to 37, with a higher total score indicates higher parenting knowledge.

The Self-Perception of the Parenting Role Scale (SPPR), Thai version, was used to measure parenting attitude. MacPhee, Benson, and Bullock[31] developed the original SPPR, with a Thai version translated by the PI. Consisting of 22 items, the SPPR is a self-completion scale in which each item has paired statements with contrasting endpoints. Participants are asked to decide which of the statements best describes them, and then answer whether that statement is sort of true or really true for them. The four possible responses include 1, 2, 4, and 5, with 1 indicative of low perceived competence, investment, satisfaction or role balance, and 5 indicatives of high perceived competence, investment, satisfaction or role balance. The possible score ranges from 22 to 110, with a higher score associated with a more positive parenting attitude.

The Parenting Sense of Competence Scale (PSOC) developed by Gibaud-Wallston and Wandersman, as cited in Johnston and Mash[32] and translated into Thai by Soomlek,[33] was used to assess parenting self-efficacy. The PSOC consists of 17 Likert-type items with six points ranging from 1 (strongly agree) and 6 (strongly disagree). The possible score ranges from 17 to 102, with a higher score indicating higher perceived parenting self-efficacy.

The Revised Thai Multi-dimensional Scale of Perceived Social Support (the Revised MSPSS) was used to examine social support. This instrument was developed by Zimet, Dahlem, Zimet, and Farley[19] and translated into Thai and revised by Wongpakaran and Wongpakaran.[34] The Revised MSPSS consists of 12 Likert-type items with seven points responses ranging from 1 (very strongly disagree) to 7 (very strongly agree). The possible score ranges from 12 to 84, with a higher score indicating higher perceived social support.

The Family Economic Strain Scale (FESS) developed by Hilton and Devall[25] was translated into Thai by the PI for examining economic strain. The FESS consists of 13 Likert-type items with five points responses ranging from 1 (far below average) to 5 (far above average). The first 12 items ask the participants to rate the frequency with which they experience strain related to financial inadequacy, worries and concerns about their financial situation, and financial problems interfering with their life. The final item asks the participants to evaluate their income relative to other families. The possible score ranges from 13 to 65, with a higher score indicating a higher perceived level of economic strain.

The Kansas Marital Satisfaction Scale (KMSS) was used to assess marital satisfaction. The KMSS was developed by Schumm, Scanlon, Crow, Green, and Buckler[35] and translated into Thai by Boonnate.[36] The KMSS consists of 3 Likert-type items examining satisfaction with marriage, husband, and relationship with husband, with seven points responses ranging from 1 (extremely dissatisfied) to 7 (extremely satisfied). The possible score ranges from 3 to 21, with a higher score indicating a higher level of marital satisfaction.

The Child-Rearing Conflict Measure developed by Spencer, Kalil, Larson, Spieker, and Gilchrist[26] was translated into Thai by PI for assessing child-rearing conflict. It consists of 5 Likert-type items with five points responses ranging from 1 (never) to 5 (very often). The possible score ranges from 5 to 25, with a higher score indicating higher confliction of child-rearing.

The *What My Baby is Like Questionnaire (WBL)*, developed by Pridham, Chang and Chiu[37] and translated into Thai by Phumonsakul,[38] was used to explore child temperament. This tool was designed to explore mothers' characterization of their infant's temperament. The WBL consists of 19 items with a nine-point rating scale graphed at equal intervals. The possible score ranges from 19 to 171, with a higher score indicating the higher perceived adaptability of an infant.

Data collection procedures: The PI or the trained research assistant (RI) identified potential participants from patient records and on postpartum check-up day also screened each participant's eligibility. Potential participants were informed about the study and their ethical rights and were asked to participate. Those consenting to participate signed a consent form, 73 participants who were younger than 18 years-old granted by their parents along with their assent. Participants were given the questionnaires to complete in privacy. As completing the questionnaires took approximately 80-105 minutes, participants were permitted to take up to three breaks at their discretion. Data collection was undertaken concurrently at nine hospitals from December 2016 to May 2017.

Data Analysis: Path analysis using the Generalized Least Squares (GLS) technique within LISREL tested the causal relationship between eight factors and parenting stress.

Results

Demographic characteristics of the sample: The age of the participants ranged from 15 to 19 years, with a mean of 17.89 (SD = 1.33). Most participants were married (88.1%), had completed junior school (42.7%), were housewife/unemployed (71.5%), and had a monthly family income of fewer than

10,000 THB or 316.48 USD (49.4 %) that mostly came from their husband (47.8%) and their parents (43.1%). Over half of participants lived at their parents' home (50.2%). The majority of participants did not plan for pregnancy (56.5%) and did not have child-rearing experience (60.1%) but received knowledge of child-rearing before pregnancy (75.9%) and received knowledge or trained for taking a parenting role during pregnancy (80.2%) and the postpartum period (92.2%).

Characteristics of the study variables: Parenting stress scores ranged from 15-57 out of 60 with a mean of 36.64 (SD = 8.3). Parenting attitude had a strong negative relationship with parenting stress. Parenting self-efficacy, social support, and child temperament had a moderate negative correlation with parenting stress. Parenting knowledge and marital satisfaction showed a low negative relationship with parenting stress. However, economic strain and child-rearing conflict had a low positive relationship with parenting stress (see **Table 2**).

Testing of Parenting Stress Model: Data analysis revealed that the hypothesized model with all proposed indices did not fit with the observed data. Therefore, model modification was undertaken based on statistics values, theoretical reasoning, and literature support.[29] Five paths with a parameter estimate of <.08 and non-significant path were eliminated, while five paths with a large modification index that can be interpreted substantively were added.[29] After modification, the final model fitted with the data (χ^2 = 23.79, df = 17, p = 0.13, RMSEA = 0.040, GFI = .98, AGFI = .95, CFI = .97; standard of fit: χ^2 = p > .05 , RMSEA ≤ .05, GFI ≥ .90, AGIF ≥ .90, CFI ≥ .90).[29] All coefficient paths in the final model were statistically significant and all predicting variables including social support, marital satisfaction, economic strain, child-rearing conflict, parenting knowledge, attitude and self-efficacy, and child temperament could explain 75% of the variation in parenting stress among first-time adolescent mothers. Parenting stress was directly influenced by parenting attitude and self-efficacy, social support, and child temperament. Parenting stress was also indirectly influenced by marital satisfaction, social support, economic strain, child-rearing conflict, and parenting knowledge, attitude, and self-efficacy (see Figure 2). Parenting attitude was the strongest influential factor while parenting knowledge was the weakest. (**see Table 3**).

Table 2 Mean (M), standard deviation (SD), and correlation coefficients of the study variables and parenting stress (n = 253)

Study Variables	M	SD	Possible score	1	2	3	4	5	6	7	8	9
Marital satisfaction	11.12	3.38	7-21	1	.32**	-.37**	-.27**	-.03^{ns}	-.35**	.20**	.37**	-.37**
Social support	55.62	12.57	12-84		1	-.18**	-.17**	.13*	.40**	.32**	.38**	-.50**
Economic strain	32.75	7.58	13-65			1	.30**	-.05^{ns}	-.31**	-.21**	-.26**	.32**
Child-rearing conflict	13.77	3.79	5-25				1	-.19**	-.34**	-.26**	-.26**	.32**
Parenting knowledge	13.74	4.10	0-37					1	.13*	.33**	.16**	-.15*
Parenting attitude	71.58	9.22	22-110						1	.44**	.53**	-.83**
Parenting self-efficacy	54.71	4.44	17-102							1	.38**	-.51**
Child temperament	110.21	13.11	19-171								1	-.58**
Parenting stress	36.64	8.38	12-60									1

Note: **p < .01, *p < .05, ns = not statistically significant

Table 3 Direct and indirect standardized coefficient for the final model

Cause-Effect	**Direct effect**	**Indirect effect**	**Total effect**
Parenting attitude → Parenting self-efficacy	0.36***	-	0.36***
Parenting attitude → Child temperament	0.36***	0.05^{ns}	0.41***
Parenting attitude → Parenting stress	-0.65***	-0.09**	-0.74***
Parenting self-efficacy → Child temperament	0.13*		0.13*
Parenting self-efficacy → Parenting stress	-0.11*	-0.02*	-0.13*
Child temperament → Parenting stress	-0.12**	-	-0.12**
Economic strain → Child-rearing conflict	0.18**	-	0.18**
Economic strain → Parenting attitude	-0.19**	-0.04*	-0.23**
Economic strain → Parenting self-efficacy	-	-0.08**	-0.08**
Economic strain → Child temperament	-	-0.09**	-0.09**
Economic strain → Parenting stress	-	0.17**	0.17**
Child-rearing conflict → Parenting attitude	-0.24**	-	-0.24**
Child-rearing conflict → Parenting self-efficacy	-	-0.09**	-0.09**
Child-rearing conflict → Child temperament	-	-0.10**	-0.10**
Child-rearing conflict → Parenting stress	-	0.17**	0.17**
Parenting knowledge → Child-rearing conflict	-0.17**	-	-0.17**
Parenting knowledge → Parenting attitude	-	0.04	0.04^{ns}
Parenting knowledge → Parenting self-efficacy	-	0.01*	0.01*
Parenting knowledge → Child temperament	-	0.02*	0.02*
Parenting knowledge → Parenting stress	-	-0.03*	-0.03*
Marital satisfaction → Economic strain	-0.39***	-	-0.39***
Marital satisfaction → Child-rearing conflict	-0.22**	-0.08*	-0.30**
Marital satisfaction → Parenting attitude	-	0.14*	0.14*
Marital satisfaction → Parenting self-efficacy	-	0.05*	0.05*
Marital satisfaction → Child temperament	0.21**	0.06**	0.27**
Marital satisfaction → Parenting stress	-	-0.13***	-0.13***
Social support → Parenting knowledge	0.14***	-	0.14***
Social support → Child-rearing conflict	-	-0.02*	-0.02*
Social support → Parenting attitude	0.34***	0.01**	0.35**
Social support → Parenting self-efficacy	0.15**	0.13**	0.28**
Social support → Child temperament	0.15**	0.16***	0.31**
Social support → Parenting stress	-0.17***	-0.30**	-0.47**

Note: ***p < .001, **p < .01, *p < .05, ns = not statistically significant

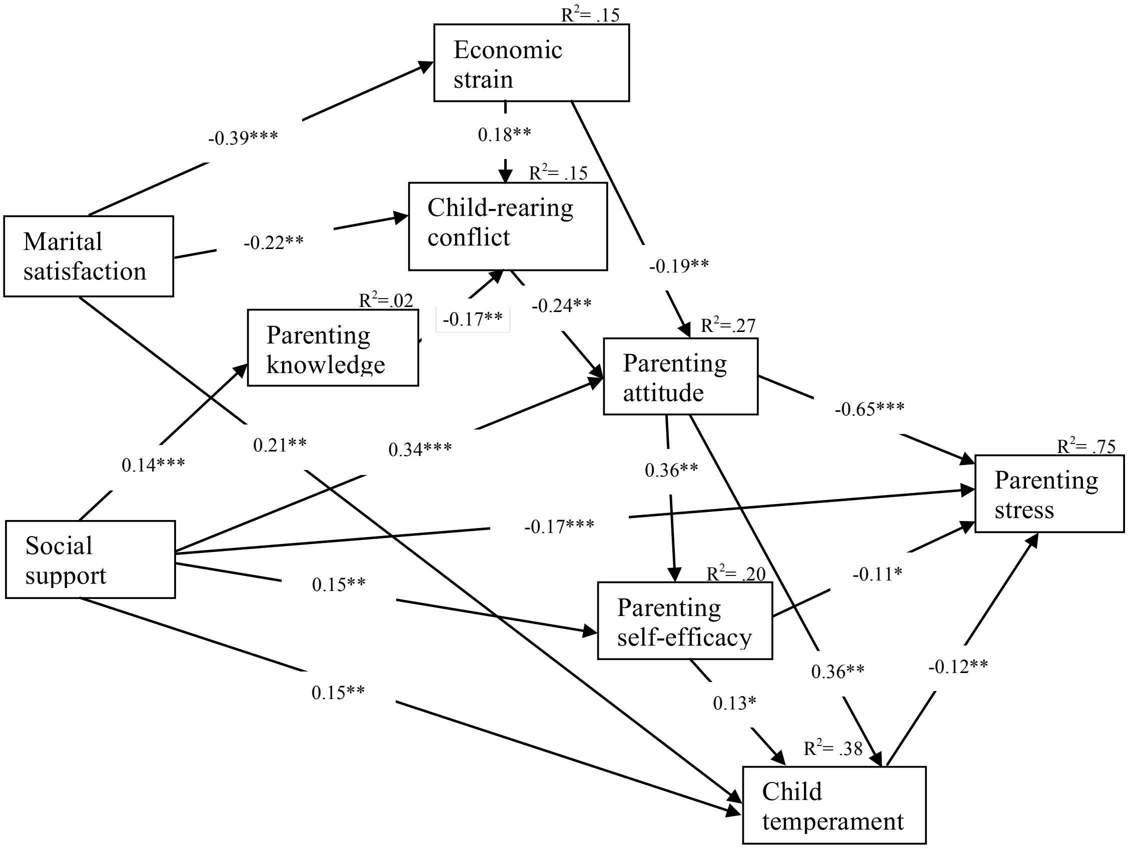

Figure 2: The final modified model of the Model of Parenting Stress in Adolescent Mothers (MPS-AM).

Chi-square (χ^2) = 23.79,df = 17, p = 0.13, RMSEA = 0.040, GFI= .98, AGFI = .95, CFI = .97
Note: ***p < .001, **p < .01, *p < .05 Standard of fit: χ^2 = p > .05 , RMSEA ≤ .05, GFI ≥ .90, AGIF ≥ .90, CFI ≥ .90

Discussion

The modified MPS-AM supports the Parenting Stress Model of Abidin's three domains[11] in that influences on parenting stress include parent, contextual, and child characteristics. Regarding parent characteristics, parenting attitude strongly and directly influenced parenting stress, while parenting knowledge showed low and indirect effect on parenting stress. All selected factors of contextual characteristics were associated with parenting stress. Social support had both direct and indirect effects on parenting stress, while the other factors had only an indirect effect. Child temperament also directly influenced parenting stress.

In this MPS-AM model, marital satisfaction had no direct effect on parenting stress but had indirect effect through economic strain and child-rearing conflict. Then economic strain and child-rearing conflict influenced parenting stress through parenting attitude, parenting self-efficacy, and child temperament. Adolescent mothers who have a poor relationship with the partner or an unsatisfying marital relationship tend to face economic hardship because they may not receive tangible support from their partner or partner's family. Bearing the entire burden of child-rearing costs can cause a negative attitude towards their parenting role, child-rearing conflict, low parenting self-efficacy, and perceptions of the child as difficult to handle, leading to parenting stress. Adolescent mothers who have a satisfying marital relationship may have low economic strain and child-rearing conflict that promote positive parenting attitude. When adolescent mothers have positive parenting attitude, they tend to prepare themselves for the parenting role by searching for child-rearing information and learning about child-rearing from many sources.[17] Concurrently, they gain greater parenting self-efficacy which helps them to cope with child-rearing problems, arrange child-rearing activities better, and use proper strategies to manage and respond to the child's needs.[13] Therefore, they may perceive their child as easy to handle and experience less stress in the parenting role. Additionally, marital satisfaction also had an indirect effect on parenting stress through child temperament. It is possible that when the mothers have marital satisfaction, they tend to perceive their child temperament as easy to handle and that reduces parenting stress.

In the present study, social support directly influenced parenting stress. It confirmed the work of Belsky[12] and Abidin[11] in that social support determines the quality of parenting practices and effects on parenting stress. Social support provides mothers with information on child development and appropriate child-rearing practices. This information promotes positive maternal role expectations and enhances parenting skills which lead to less stress in child care. Social support also indirectly influenced parenting stress through parenting knowledge, parenting attitude and self-efficacy, and child temperament. Based on the findings, most participants lived in their parents' house. This condition facilitated the exchange of feelings, opinions, and knowledge related to child-rearing practices and child development among adolescent mothers and other family members. Also, most participants reported that they received information and training regarding parenting skills, such as breastfeeding and bathing the baby, from health service providers during pregnancy and postpartum. These circumstances enabled mothers to gain knowledge of child-rearing practices, child development, and parenting role, and subsequently, take care of their child and handle child-rearing problems well. Such support contributed to positive attitudes towards parenting, increased self-confidence in parenting and perceptions of child temperament as easy. Therefore, it can be concluded that mothers who have greater social support will have more parenting knowledge, positive parenting attitude and higher parenting self-efficacy, and perceptions of child temperament as easy to handle, and decrease parenting stress. The relationship between social support and parenting stress is noteworthy. The direct effect of social support on parenting stress was less than the total effect. It is possible that parenting knowledge, child-rearing conflict, parenting attitude and self-efficacy, and child temperament might be mediating factors between social support and parenting stress.

Regarding previous models of parenting stress, Chang and colleagues[13] focused on parent and child characteristics. However, they did not include the social context which is very important for transitioning to be a mother. Social context always affects daily lifestyle including raising a child and being a mother, especially during the postpartum period of Thai people. Younger[39] had proposed a theoretical model of parenting stress based on existing empirical evidence. Nevertheless, this model did not include child characteristics. A study by Ostberg and Hagekull[40] focused on the parent, contextual and child characteristics. However, their model did not include parent factors that are manageable to prevent and reduce parenting stress, such as parenting attitude and self-efficacy. Their model focused on maternal age and education, parity and workload. To prevent or minimize parenting stress in adolescent mothers all three domains should be considered.

Limitations

Using only self-report questionnaires for gathering data was a limitation of this study. Various methods, such as observation of stress and maternal behaviors while taking care of the child, should also be used in evaluating parenting stress.

Conclusions and Implications for Nursing Practice

Parenting stress among adolescent mothers can be predicted by social support, marital satisfaction, economic strain, child-rearing conflict, parenting knowledge, attitude and self-efficacy, and child temperament. These results provide insights for nurses or midwives working in antenatal care clinics, postpartum wards, and postpartum check-up clinics to create programs to help prevent parenting stress in first-time adolescent mothers. Such programs should emphasize on promotion of positive parenting attitude and percieving adapted child temperament as well as enhancing parenting self-efficacy and social support. Promoting family and spouse support and preparing family members to mentor the mothers during pregnancy and the postpartum period is also essential. These key people will help the mother cope with child-rearing and minimize the stress of the first-time adolescent mothers.

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References

1. World Health Organization. Global health observatory (GHO) data [cited 2018 August 15]. Available from http://www.who.int/gho/maternal_health/reproductive_health/ adolescent_fertility/en/
2. Department of Health. Department of health annual report 2017 [Internet] Bangkok: Graphic Design Press [2018 Feb] [cited 2018 August 15]. Available from http://planning.anamai.moph.go.th/download/D_report_year/Report_DoH61.pdf
3. Bureau of Reproductive Health. Act for prevention and solution of the adolescent pregnancy problem, B.E. 2559 (2016). [2016] [cited 2017 December 15]. Available from http://rh.anamai.moph.go.th/download/all_file/index/Teen%20Pregnancy%20Act%20Certified%20Version%20(1).pdf
4. Wakschlag LS, Hans SL. Early parenthood in context: Implications for development and intervention. In Zeanah CH. Handbook of infant mental health. 2nd ed. New York: The Guilford Press Publishers; 2000, pp. 129-144.
5. Bailey NS. Perceived social support and cognitive readiness to parent as predictors of attachment, parenting style, and parenting stress: A comparative study of adult and adolescent mothers [dissertation]. [New York]: Pace Univ.; 2014. 67p.
6. Abidin RR. The determinants of parenting behaviors. J Clin Child Psychol. 1992 21(4): 407-412.
7. Calkin SD, Hungerford A, Dedmon SE. Mothers' interactions with temperamentally frustrated infants. Infant Ment. Health J. 2004 25(3): 219-239.
8. Mercer RT. Becoming a mother versus maternal role attainment. J Nurs Scholarsh. 2004 36(3): 226-232.
9. Smith TK. The relationship between knowledge, attributions and behavior in adolescent mothers: Implications for child outcomes. Santa Barbara: University of California; 2001. 242p.
10. Venkatesh KK, Phipps MG, Triche EW, Zlotnick C. The Relationship between parental stress and postpartum depression among adolescent mothers enrolled in a randomized controlled prevention trial. Matern Child Health J. 2014 18(6): 1532-1539.
11. Abidin RR. Parenting stress index, third edition: Professional manual psychological assessment resources [1995] [cited 2015 March 20]. Available from https://www.researchconnections.org/childcare/resources/298
12. Belsky J. The determinants of parenting: A process model. Child Dev. 1984 55(1): 83-96.
13. Chang Y, Fine M A. Modeling parenting stress trajectories among low-income young mothers across the child's second and third years: Factors accounting for stability and change. J. Fam. Psychol. 2007 21(4): 584-594.
14. Rafferty Y, Griffin KW, Lodise M. Adolescent motherhood and developmental outcomes of children in early head start: The influence of maternal parenting behaviors, well-being, and risk factors within the family setting. Am J Orthopsychiatry. 2011 81(2): 228-245.
15. MacPhee D. Knowledge of infant development inventory. Unpublished manual and questionnaire. Chapel Hill: University of North Carolina; 1981. 15p.
16. Huang K, Teti D, Caughly M, Feldstein S, Genevro J. Mother-child conflict interaction in the toddler years: Behavior patterns and correlates. J Child Fam Stud. 2007 16(2): 219-241.

17. Holden GW, Buck MJ. Parental attitudes toward childrearing. In Bornstein MH. Handbook of parenting, Vol. 3: Being and becoming a parent. 3nd ed. Mahwah, NJ: Lawrence Erlbaum Associates Publishers; 2012, pp. 537-562.
18. Charoensatsiri R, Chaimongkol N, Pongjaturawit Y. Factors predicting parenting stress in adolescent mothers of first-born infants. J Prapokklao Hosp Clin Med Educat Center. 2014 31(2): 105-113.
19. Zimet GD, Dahlem NW, Zimet SG, Farley GK. The Multidimensional Scale of Perceived Social Support. J. Pers. Assess. 1988 52(1): 30-41.
20. Rhodes JE, Woods M. Comfort and conflict in the relationships of pregnant, minority adolescents: Social support as a moderator of social strain. J Community Psychol. 1995 23(1): 74-84.
21. Dukewich TL, Borkowski JG, Whitman, TL. Adolescent mothers and child abuse potential: An evaluation of risk factors. Child Abuse Negl. 1996 20(11): 1031-1047.
22. Wacharasin C, Thienpichet S, Deoisres W. Predicting maternal stress of mothers having children age 0-3 years. The Public Health Journal of Burapha University. 2011 6(1): 32-41 [in Thai].
23. Hendrick SS, Hendrick C. Love and satisfaction. In Sternberg RL, Hojjat M. Satisfaction in close relationships. New York: Guilford; 1997, pp. 56-78.
24. Larson NC. Parenting stress among adolescent mothers in the transition to adulthood. Child Adolesc Social Work J. 2004 21(5): 457-476.
25. Hilton JM, Devall EL. The family economic strain scale: Development and evaluation of the instrument with single- and two-parent families. J Fam Econ Issues. 1997 18(3): 247-271.
26. Spencer MS, Kalil A, Larson NC, Spieker SJ, Gilchrist LD. Multigenerational co-residence and childrearing conflict: Links to parenting stress in teenage mothers across the first two years postpartum. Appl. Dev. Sci. 2002 6(3), 157-170.
27. Chess S, Thomas A. Origins and evolution of behavior disorders. New York: Brunner; 1984.
28. Manachevahul S, Prasopkittikun T, Sangperm P. Factors predicting parenting stress in mothers of infants. Journal of Nurses' Association of Thailand, North-Division. 2012 30(1): 53-62 [in Thai].
29. Pui-Wa, L, Qiong W. Introduction to structural equation modeling: Issues and practical considerations. Educ. Meas. 2007 26(3): 33-43.
30. Son, J. Back translation as a documentation tool. Transl. Interpret. 2018 10(2): 89-100.
31. MacPhee D, Benson JB, Bullock D. Influences on maternal self -perceptions. Unpublished manuscript. Colorado State Univ.; 1986.
32. Johnston C, Mash E J. A measure of parenting satisfaction and efficacy. J Clin Child Adolesc Psychol. 1989 18(2): 167-175.
33. Soomlek S. A Causal model of maternal role mastery among first-time mother [dissertation]. [Bangkok]: Mahidol Univ.; 1995. 125p.
34. Wongpakaran N, Wongpakaran, T. A revised Thai multi-dimensional scale of perceived social support. Span J Psychol. 2012 15(3): 1503-1509.
35. Schumm WR, Scanlon, ED, Crow CL, Green DN, Buckler DL. Characteristics of the Kansas marital satisfaction scale in a sample of 79 married couples. Psychol. Rep. 1983 53(2): 583-588.
36. Boonate N. (2014). Factors predicting occurrence of intimate partner violence during pregnancy among Thai pregnancy women [dissertation]. [Chiang Mai]: Chiang Mai Univ.; 2014. 122p.
37. Pridham KF, Chang AS, Chiu Y. Maternal parenting self-appraisals: The contribution of perceived infant temperament. Res Nurs Health. 1994 17(5): 381-392.
38. Phumonsakul S. (2000). A structural equation model of maternal role attainment among working primiparous mothers [dissertation]. [Bangkok]: Mahidol Univ.; 2000. 224p.
39. Younger, J.B. (1991). A model of parenting stress. Res Nurs Health, 14:197-204.
40. Ostberg, M., & Hagekull, B. (2000). A structural modeling approach to the understanding of parenting stress. J. Clin. Child Psychol, 29(4), 615-625.

แบบจำลองเชิงสาเหตุของความเครียดจากการเลี้ยงดูบุตรในวัยรุ่นที่เป็นมารดาครั้งแรก

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บทคัดย่อ: ความเครียดจากการเลี้ยงดูบุตรส่งผลต่อการทำหน้าที่มารดาและสุขภาพจิตของมารดาซึ่งส่งผลต่อพัฒนาการของทารก การศึกษาปัจจัยที่เกี่ยวข้องกับความเครียดจากการเลี้ยงดูบุตรจึงมีความจำเป็นในการวางแผนป้องกันหรือลดความเครียดจากการเลี้ยงดูบุตรในมารดาวัยรุ่น การศึกษานี้มีวัตถุประสงค์เพื่อพัฒนาและทดสอบแบบจำลองเชิงสาเหตุของความเครียดจากการเลี้ยงดูบุตรในวัยรุ่นที่เป็นมารดาครั้งแรก กลุ่มตัวอย่างคือวัยรุ่นที่เป็นมารดาครั้งแรก จำนวน 253 คน ที่รับการตรวจหลังคลอด ณ โรงพยาบาล 9 แห่งในจังหวัดหนึ่งทางภาคเหนือของประเทศไทย เก็บรวบรวมข้อมูลด้วยแบบสอบถามจำนวน 9 ฉบับ ได้แก่แบบสอบถามความเครียดในการเลี้ยงดูบุตร แบบวัดความรู้เกี่ยวพัฒนาการและการดูแลตามพัฒนาการของทารก แบบสอบถามการรับรู้บทบาทการเป็นมารดา แบบสอบถามการรับรู้ความสามารถในการเป็นมารดา แบบสอบถามความรู้สึกหลากหลายมิติเกี่ยวกับความช่วยเหลือทางสังคม (ฉบับปรับปรุงภาษาไทย) แบบสอบถามความตึงเครียดทางเศรษฐกิจในครอบครัว แบบสอบถามความพึงพอใจในชีวิตสมรส แบบสอบถามความขัดแย้งในการดูแลบุตรและแบบวัดคุณลักษณะบุตร สถิติที่ใช้วิเคราะห์คือสถิติพรรณนา สถิติสหสัมพันธ์เพียร์สันและการวิเคราะห์เส้นทางโดยโปรแกรมลิสเรล

ผลการศึกษาพบว่าแบบจำลองเชิงสาเหตุของความเครียดจากการเลี้ยงดูบุตรในสตรีวัยรุ่นที่เป็นมารดาครั้งแรกมีความสอดคล้องกับข้อมูลเชิงประจักษ์ และสามารถทำนายความแปรปรวนของความเครียดจากการเลี้ยงดูบุตรได้ร้อยละ 75 โดยที่แรงสนับสนุนทางสังคม ทัศนคติต่อการเป็นมารดา การรับรู้ความสามารถในการเป็นมารดาและคุณลักษณะของทารก มีอิทธิพลโดยตรงต่อความเครียดจากการเลี้ยงดูบุตร นอกจากนี้แรงสนับสนุนทางสังคม ความพึงพอใจในคู่สมรส ความตึงเครียดทางเศรษฐกิจ ความขัดแย้งในการเลี้ยงดูบุตร ความรู้ในการเป็นมารดา ทัศนคติต่อการเป็นมารดา และการรับรู้ความสามารถในการเป็นมารดา มีอิทธิพลทางอ้อมต่อความเครียดในการเลี้ยงดูบุตร ดังนั้นควรสร้างโปรแกรมเพื่อป้องกันหรือลดความเครียดจากการเลี้ยงดูบุตรโดยส่งเสริมให้สตรีวัยรุ่นที่เป็นมารดาครั้งแรกมีทัศนคติที่ดีต่อการตั้งครรภ์ ส่งเสริมให้มีการรับรู้ความสามารถในการเป็นมารดา ส่งเสริมการสนับสนุนทางสังคมและส่งเสริมให้มีการรับรู้ลักษณะทารกที่ดี

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คำสำคัญ: มารดาวัยรุ่น รูปแบบเชิงเหตุผล การเป็นบิดามารดา บทบาทการเป็นบิดามารดา ความเครียดในการเลี้ยงดูบุตร

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