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Original Research

Collaborative Model of Teachers, Students and Families to Improve Parents Knowledge and Skills on Food Safety of Elementary School Students

Sigit Mulyono, Elly Nurachmah, Junaiti Sahar and Sabarinah Prasetyo

Faculty of Nursing, Universitas Indonesia, Depok, Indonesia

ABSTRACT

Introduction: School-age children in Indonesia are at risk of health problems due to food insecurity. Parents have a very important role in preparing safe food, both at home and for lunch at school. The aim of this study was to determine the effect of a collaboration model of teachers, students, and their families (KOGUSIGA) towards the parents' knowledge and skills on the food safety of elementary school students.

Methods: This study applied a quasi-experiment design pre- and post-test with a control group. The subject sample used was the total sampling method, involving 206 parents. The study was conducted for over 10 weeks, supported with modules for nurses and parents, textbooks for the students and their families, and a student workbook.

Results: The results showed that the KOGUSIGA model is associated significantly with greater knowledge (p-value = 0.000; with a mean difference of 20.23) and the parent's skills (p-value = 0.000; with a mean difference of 12.3) to do with food insecurity.

Conclusion: The KOGUSIGA model tends to improve the knowledge and skills parents significantly, in relation to the food safety of the students. It is expected that the KOGUSIGA model will be applied under the community health nursing/school health nurses' supervision.

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CONTACT

Sigit Mulyono
sigit@ui.ac.id
Faculty of Nursing, Universitas Indonesia, Depok, Indonesia

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INTRODUCTION

School-age is a phase when children are between 6 to 12 years of age (Brown, et. al., 2005). During this phase, motor development is relatively fast yet not their intellectual development yet. While chool-age children start to develop logical thinking, they are still attached to perceptual facts (Brown, et. al., 2005; Wong, Eaton, Wilson, Winkelstein, & Schartz, 2008). Consequently, School Age Children are not yet able to predict level of danger, including the hazard of unsafe food (Brown, et. al., 2005; Siburian, 2012). This fact is the main cause behind why most school-age children experience various kinds of health threat related to food safety, such as food-borne diseases, food ingredients containing dangerous substances, and not meeting their nutritional needs (FAO/WHO, 2002). Safe food is defined as food which is balanced in terms of the fulfilment of one's daily energy, protein, mineral, vitamins, and other nutrition component needs, and not causing illness (Gross, Cohen, & Kahan, 2006). The term "not causing illness" means that the food is safe from microorganism pollution that causes disease and is free from hazardous chemicals. Many cases of sickness happen because the level of food safety is low. The results of the Asia Food Safety Conference held in Malaysia in 2014 showed that cases of food-borne illnesses are still the main priority. Food that was contaminated, especially by microorganisms, was the main cause (FAO/WHO, 2004). Food contaminated by *E. coli* bacteria was responsible for more 3,950 cases of illness and 53 deaths in European countries in 2017 (EFSA, 2012).

The effect of low food security is very dangerous for school age children, as it can lead to death. Food poisoning cases in India caused the death of 23 elementary school students (NIDM, 2013). In Indonesia, cases of health problems related to food safety in children is relatively high. Based on a research study by Andarwulan et al. (2009), in

Indonesia, health problems caused by food were experienced by 21.4% of children in Bogor, Indonesia, where 75.5% of them were school age children. Food poisoning cases was at the top of the list.

Food-borne sickness is one example of poor safety food. These phenomena were the main issue of the discussed health topic and became one of the world spotlights declared by FAO/WHO at the Forum of Safety Regulation in Morocco, 2002. The forum asserted that the diseases caused by food contribute to a number of illnesses and deaths in the population of school age children. Aside from food-borne diseases because of food, the health problem cases caused by a lack of nutrition were also high.

Based on a research study conducted in 2011, out of 517 elementary schools or Islamic elementary schools (MI) in the city of Depok, there were 1,048 children with thin bodies and 7 children suffering from malnutrition (with a severely thin body) (Dinas Kesehatan Kota Depok, 2012). A survey conducted in one of the elementary schools in Depok found that 36.76% of the school population was made up of malnutrition cases (Kusumaningsih, 2010).

In addition to food-borne diseases and the exposure to dangerous chemicals, the next food safety issue was nutrition intake, which does not meet the daily requirements, causing malnutrition. The lack of nutritional intake is a common problem in the school age children (Stanhope & Lancaster, 2004; Allender & Spradley, 2005). Based on Basic Health Research (Riskesdas) in 2010 regarding nutrition, it showed that the level of nutrition fulfilment is still worrying (Kementerian Kesehatan Republik Indonesia, 2011). On a national scale, 40.7% of Indonesian people consume less food than the minimum daily standard or do not meet the national standard nutritional adequacy rate. The problem of a lack of protein consumption happened in all age groups, especially school age children (Kementerian Kesehatan Republik Indonesia, 2011).

The condition above has forced the efforts of nutrition fulfilment and food safety to be increased as much as possible. One of the efforts made by the WHO is the Global Strategy for Food Safety, and its main strategy is to provide and promote health campaigns. Unfortunately, in Indonesia, health campaign programs are not integrative, making them not fully effective. There needs to be an integrated health program, which is like the UKS (School Health Unit) program.

An effort towards a more comprehensive and integrative approach has been introduced by the Ministry of Health through the Advocacy, Cultivating Atmosphere, and Community Empowerment model (*Advokasi, Bina suasana, dan Gerakan model pemberdayaan masyarakat* or ABG). The ABG strategy is the main strategy set forth in all health promotion guides in various settings throughout Indonesia, including in the institutional setting of education. One of the programs that it runs is UKS. However, ABG has not succeeded yet in improving the students' health condition. This can happen because the strategy of ABG is still in the concept stage. There is no clear operational guidance, and there is even an absence of trained human resources to run it (Mulyono, 2003). In addition, there is still no optimal coordination of teachers, families, and students in the implementation of the UKS program (Widjajanti, 2012). MacLellan, Taylor & Freeze (2009) and Ratnapradipa (2011) have suggested that parents and teachers are important role models for students in the formation of safe and balanced eating behaviour. This has caused the ABG strategy through the UKS program to still be difficult to apply in the field, especially when dealing with the problem of food safety in schools. Therefore, an easy to implement program is needed by empowering the human resources that can collaborate with teachers, students and their families. This will play a role in the process of establishing healthy behaviour in school-aged children, one of which is helped by a school health nurse (school health nursing).

The researchers then developed a model of nursing care in schools that aims to improve the role of nurses in collaborating with teachers, students, and their families, which will trigger changes in food safety practice. The model being developed is called the Teachers, Students, and Families Collaboration (*Kolaborasi Guru, Siswa, dan Keluarga* or KOGUSIGA). KOGUSIGA emphasises on a food safety program to develop the habit of choosing, handling, and consuming healthy and safe food through the collaboration of teachers, students, and their families.

The Indonesian National Agency of Food and Drug Control (2005) explained that the use of hazardous additive substances or the contamination of other chemicals in food could happen because of a lack of understanding and poor family behaviour to do with food safety. The family is the micro system that interacts the most with a child and influences his/her behaviour. Family plays an important role in determining healthy behaviour in everyday life, including children's behaviour in terms of the fulfilment of nutritional needs. FAO (2004) reported that the percentage of food sources that have caused food poisoning was 47.1% from household foods and 14.4% from snack foods. In addition, the Secretariat General of the Food Intelligence Network (2005) stated that the setting where food poisoning took place the most was in the home environment, which was 39.9%, and the school environment, which was 23.5%. A study by the Minister of Health also showed that the school and home environment could be the providers of less-healthy food (Sekretariat Jenderal Jejaring Intelijen Pangan, 2005). Therefore, the home environment (family) needs to be provided with education regarding food safety. The KOSUSIGA model can be the alternative to family nursing interventions in order to improve the role of the family regarding the food safety program.

Parents are the role models for their children, and they can influence the behaviour of having a safe and balance diet in school age children. Parents are also companions, as well as being educators for their

children while they are going about their daily activities. Consequently, it is important for parents to acknowledge and understand possible health problems and disorders, which are relatively wide and complex, especially about food safety. This research aims to identify the influence of the KOGUSIGA model on the improvement of the knowledge and skills of parents regarding food safety in elementary school students.

MATERIALS AND METHODS

The design of this research was a quasi-experiment pre-post test. The research was conducted in an elementary school in Depok, from April to June 2014. The taking of samples was carried out by using the total sampling technique, and the total samples were 206 respondents who were parents, who matched the inclusion criteria. There were 103 respondents in the intervention group and 103 respondents in the control group.

Selected respondents supplied personal informed consent prior to the study. The KOGUSIGA intervention model was applied by the nurses, who had received the appropriate training according to particular stages. The nurses educated the parents, both mothers and fathers, in the class by inviting them to come into the school. The media used in this study was the modules, containing training materials about the nutritional needs of school age children, the selection of safe food, cooking safe food, serving safe food, storing safe food, choosing healthy snacks, and the washing of hands. The book was tested by BPOM personnel, as well as the health promotion program, nutrition program, environmental health program, and the School Health program. The media used was workbooks as an evaluation book, especially designed for parents and the students. The researcher was committed to the research ethics of each and every respondent participating. According to the National Commission on the Health Research Ethics of the Indonesian Minister of Health (2006), there are four principal research ethics: beneficence, respect for persons, non-malfeasance, and justice. Ethical clearance was issued by The Research Ethic Committee of the Faculty of Nursing, of Universitas Indonesia.

The process of data retrieval was done by the respondents filling out the questionnaires by way of an interview in the form of the parents' and students' demographic information, the parents' knowledge and the parents' skills. The questions regarding the demographic information (parents and the homeroom teachers) were to do with age, sex, level of education, level of economy based on salary, and the relationship to the students. The questions about the level of family knowledge consisted of 9 questions about nutritional content with pictures and 25 yes/no questions. The scale of family skills was also measured by using questionnaires, consisting of 25 "always – often – seldom – never" questions. The family skills questions were about the skills held on living a clean and healthy life (PHBS), safe food, food handling, food storage, balanced diet, the nutritional content of food, and food serving. The maximum score before being given the intervention on the knowledge variables was 5, whereas after being given the intervention, the maximum score of knowledge increased to 7. The maximum score before being given the intervention on the skill variable was 26, whereas after being given the intervention, the maximum skill score increased to 55.

To analyse the data, a specialised computer program was employed. To determine the change before and after the inclusion of the KOGUSIGA intervention model, the data was analysed using a bivariate test. The Paired T-test was used on the numeric data for a comparison between the two paired groups with a normal data distribution, and the alternative Wilcoxon test was used for the abnormal data distribution. Both the Paired T-test and Wilcoxon test were compared (Dahlan, 2009).

RESULTS

The characteristic of the respondents based on the average age of the students' parents in the intervention group was 38.3 years old and this was almost identical to the average of the control group, which was 40.1 years old. The youngest in the intervention group was 18 years old and the oldest was 71 years old (Sd = 8.22), while in the control group, the youngest was 20 years old and the oldest was 62 years old (Sd = 7.86) (Table 1).

In addition, the sex of the parents in the intervention group was dominated by females (79.6%), as well the control group by 73.8%. In terms of the level of education, in the intervention group, 47.6% of the respondents were high-school graduates while in the control group, more than half of the respondents (53.4%) were high-school graduates (Table 2).

The data on the parents' income in the both intervention and control group was relatively identical. More than half of the respondents earned less than 2.4 million rupiah per month, with 55.3% in the intervention group and 57.3% in control group. In terms of the relationship with the students, both groups were almost similar in that the respondents were taking care of their biological children, with the data showing 89.3% in the intervention group and 90.3% in the control group respectively (Table 3).

The questionnaire analysis on the parents' knowledge showed that the parents who were given the KOGUSIGA intervention experienced an improvement in their awareness to do with the importance of having breakfast. Before the intervention, the total percentage of the parents correctly responding to the statement "having breakfast does not affect focus in learning process" was only 39.8%. After the intervention, this increased to 78.6%. Family knowledge about the importance of washing the ingredients before cooking them increased from 68.9% before the intervention to

Table 1. Distribution of the Parents/Guardians of the Students by Age in both the Intervention and Control Group (n = 206)

Age variable	n	Mean	Median	Min	Max	Sd	*p value*
Intervention group	103	38.25	38.00	18	71	8.22	0.191
Control group	103	40.07	39.00	20	62	7.86	

Table 2 Distribution of the Parents/Guardians of the Students by Sex and Level of Education in both the Intervention and Control Group (n = 206)

Variable	Intervention group		Control group		*p value*
	n	%	n	%	
Gender					
Male	21	20.4	27	26.2	
Female	82	79.6	76	73.8	0.323
Total	103	100.0	103	100.0	
Level of education					
< Senior High School	42	40.9	43	41.7	
Senior High School	49	47.6	55	53.4	0.230
College	12	11.7	5	4.9	
Total	103	100.0	103	100.0	

Table 3. Parents/Guardians of the Students by Income and the Relationship with the Children in both the Intervention and Control Group (n = 206)

Variable	Intervention group		Control group		*p value*
	n	%	n	%	
Income					
< UMR*	57	55.3	59	57.3	
≥ UMR*	46	44.7	44	42.7	0.780
Total	103	100.0	103	100.0	
Relationship with student					
Biological children	92	89.3	93	90.3	
Not the biological children	11	10.68	10	9.7	0.198
Total	103	100.0	103	100,0	

*UMR: *Upah Minimum Regional* (Regional Minimum Wages)

Table 4. The effect of the KOGUSIGA Intervention Model towards the Knowledge and Skills of Families in the Intervention and Control Groups (n =206)

Group	n	$\bar{x}$ Pre (%)	s	Normality Test *****	$\bar{x}$ Post (%)	s	Normality test *****	% margin $\bar{x}$	p-value 1-tailed pre-post
Knowledge									
Intervention	103	12.9 (38,21)	5.39	0.000	19.87 (58.44)	3.81	0.013	20.23	0.000*
Control	103	20.66 (60.76)	3.87	0.030	20.64 (60.70)	3.97	0.014	-0.06	0.431*
Skills									
Intervention	103	64.61	16.04	0.000	76.91	8.44	0.200	12.3	0.000*
Control	103	71.43	9.67	0.200	79.68	8.30	0.123	8.25	0.000**

Note: * Wilcoxon Test, ** T-Test Paired, ****T-Test Independent, *****Kolmogorov-Smirnov Test,
s: deviation standard

91.3% after the intervention. However, the awareness of parents in using clean water was relatively high (87.4%) throughout.

The results of the questionnaire analysis on parents' skill showed an improvement in the knowledge regarding the importance of having breakfast, followed by an improvement in the skill of preparing a breakfast meal. This was proven by the increase in the percentage of parents responding with "always" for the statement "I prepare breakfast for my children", from 40.8% before the intervention to 83.5% after the KOGUSIGA intervention. The parents' skill of choosing clean and safe wrapped food also improved. Before the intervention, there were only 51.5% of parents responding with "always", and after the intervention, this increased to 86.4%. A positive change in breakfast behaviour should be improved, since the number of school-age children who do not eat breakfast in several big cities is considerably low, at 16.9-59.0% (Hardiansyah & Aries, 2012). Education on nutrition health education involving the parents in relation to KOGUSIGA can be implemented in other schools in order to improve the habit of having breakfast among the students. A research study conducted by Fries, Martin, & Horst (2017)

showed that the parents' skill of preparing a packed meal was related to their children's health.

DISCUSSION

The research showed that there was a significant improvement in the average knowledge and skills of parents in the intervention group after being treated with the KOGUSIGA intervention model, whereas in the control group, there was no improvement shown in the knowledge and skills of the parents. The questionnaire analysis of the parents' knowledge showed that parents who were given the KOGUSIGA intervention experienced an improvement of their awareness about the importance of breakfast for the students. Before the intervention, the total percentage of parents correctly responding to the statement "having breakfast does not affect focus in learning process" was only 39.8%, whereas after the intervention, it increased to 78.6%. Family knowledge about the importance of washing the ingredients before cooking them increased from 68.9% before the intervention to 91.3% after the intervention. However, the awareness of parents in using clean water was relatively high (87.4%) in both groups. The control group had more male in the sample, and thus, more educated respondents.

The results of this research are in accordance with the research conducted by Prelip, Thai, Erausquin, & Slusser (2011), stating that there was a significant improvement in the parents' knowledge and nutrition skills when it came to improving the school-age children's level of nutrition after being given education on nutrition and health for five hours a week. Prelip, et al. believed that the effort to improve the school-age children's level of nutrition must focus on the school-age children's parents by educating them, so then the parents can be the role model when it comes to having a healthy diet for their school age children.

The results of the KOGUSIGA intervention also show that the student skill variable is not effective. This is supported by Safriana's research (2012), which revealed that there is no clear relationship between nutritional knowledge and the schools in choosing snacks. Things that can be explained by the knowledge obtained by the child is only limited to knowledge, while the effect of consuming unsafe food, unhealthy food, and a lack of nutrients was not sufficient. Dixey et al. (2001) in Ellis (2007) mentioned that children are good at learning what to expect, but children will still try to do what they like. Eliasen (2007) said that the acceptance of new foods for children, and changing their eating habits is easy. Intensive communication between the students and their parents is the way forward for mutual learning, based on a research study conducted by Ratnapradipa, et. al (2011), using the Child-to-Parent Instruction model.

Although overall there was an increase in knowledge, the parents' level of knowledge about the definition of healthy food, which is food that has been cleanly served, was still low, even before and after the intervention. Before the intervention, the parents who correctly responded only made up 4.9%. After the intervention, the level of knowledge about the given point did not show a significant improvement, with the respondents who correctly responded making up 16.5%. Saadia (2015), in her research study, argued that there was no significant difference in the parents' knowledge before and after the health education program. Ahmad asserted that naturally, every parent has decent level of basic knowledge concerning the nutrition that is appropriate for their children.

Parents have the willingness to be able to provide safe and nutritious food, so they have to also figure out what should be served to their children. However, while there was no difference in the level of knowledge, it was not an indication that all parents showed a similar attitude to nutrition intake, since the knowledge that they possessed did not necessarily confirm that the parents would apply what they knew. To overcome this situation, it is needed to routinely evaluate and review the parents' motivation to feed and serve food. In the KOGUSIGA intervention model, parents and nurses routinely evaluated the students and families' eating behavior using a workbook once a week. When the evaluation score was below average, teachers or nurses provided a consultation. Hence, when implementing the KOGUSIGA model in the future, the evaluation and consultation program must be prioritised.

Based on the concept of the Health Belief Model by Rosenstock (1990) cited by Allender, Rector, Warner (2008), the individual's ability to obtain nutritional fulfilment was determined by the students' knowledge, attitude, and skill in relation to food safety. The KOGUSIGA model adopted the Health Belief Model by preparing the school-age children to improve their skills when it came to choosing safe food. In this model, there were attempts to transfer the knowledge about food safety to improve the awareness of the advantage of when students, teachers and families can fulfil their nutritional needs. The perception on the risks experienced when it comes to unhealthy food and snacks in the school environment forces students, teachers, and parents to adopt a healthier lifestyle.

Knowledge about the importance of monitoring nutritional adequacy that the parents acquired from the training and modules encouraged the improvement of the skill of monitoring nutrition. Before the intervention, the number of parents responding with "always" and "often" was only 39.8% and 20.4% respectively, while after the intervention, the percentage increased to 69.9% and 25.2%. However, the improvement in knowledge about the importance of doing exercise was not followed by the skill improvement. Before the intervention, only 14.6% of respondents responded with "always" to the statement "I do exercise regularly with my children". After the intervention, there was no significant improvement, as it remained only 16.5%. Developing

the habit of doing regular exercise is something that takes motivation, time, and is done gradually. Rodearmel et al. (2006), in their research on the prevention of obesity in children 8-13 years old involving their parents, proved that it took 13 weeks and a gradual process to create a positive change in students and parents IMT. We, as researchers, realised that this point was not maximised through the monitoring of students and family activity.

Regularly doing exercise is one of the indicators of a family with PHBS, which means the family is capable of preserving, improving and protecting the health of each and every member of the family from the threat of disease and a less-conducive and unhealthy environment (Kementerian Kesehatan Republik Indonesia, 2011). In addition, The Message of Balanced Nutrition (PGS) of 2014 suggested that physical activity is a part of the fulfilment of a balanced nutritional state. Physical activity involving all kinds of body movement, including doing exercise, is one of the ways to balance the nutritional input and output within our bodies. Aside from regular monitoring, through the KOGUSIGA model, school nurses can cooperate with the community health nurse to improve the activity of students and families through the medium of regular exercise.

The goal of health education on food safety in school-age children is to improve not only the knowledge, but also the skill, of school-age children regarding food safety (Al-sahbib, Husain, & Khan, 2017). The KOGUSIGA intervention model also affected the parent's awareness regarding the students' consumption behaviour of snack food by asking them what snack food they consumed on a daily basis. Before the intervention, the percentage of parents asking their children was only 33%, but after the intervention, this improved to 72.8%. However, the parents were not motivated enough to ask the teachers to monitor the students' behaviour on buying snack food while in school. Before the intervention, the number of parents responding with "always" and "often" was 24.3% and 16.5%. After the intervention, there was only small incremental increase to 26.2% and 19.4%. Consuming healthy food snacks is an indicator of PHBS in the school environment (Kementerian Kesehatan Republik Indonesia, 2011). The scope and purpose of UKS is the implementation of the good practice of PHBS in schools, since it is composed of the behaviour practiced by students, teachers, and society surrounding the school on the basis of awareness as a result of the learning process. Hence, the improvement of the parents' awareness of the school-age children's behaviour in consuming safe food snacks in school needs to be boosted. The knowledge possessed by parents encourages them to try to apply the material that has been taught in order to fulfil their children's nutritional needs. However, sometimes parents force their children to consume food that they do not like. This triggers the difficulty in children when it comes to liking that kind of food (Gregory, Paxton, &Brozovic, 2010).

According to the ecology system theory, there are several factors in the children's environment that can affect safe nutritional fulfilment, which are microsystem, mesosystem, exosystem, and the macrosystem. The microsysystem is a part of an individual directly interacting with his/her social life, such as friends of the same age, family, neighbours, and the school. Through the microsystem, school age children will learn a lot about health behaviour, and the children are not perceived as the passive receiver in this order. The fulfilment of school age children's nutritional needs will also be affected by the mesosystem, which is the school environment including food-selling environments such as the school canteen or cafeteria. Accordingly, in this research, it is necessary to conduct supervise the food-selling activities in schools so that they can fulfil the standards of safe and balance nutrition. The government, by the means of the closest health service units, which are Puskesmas, is part of the exosystem that influences students when it comes to improving their health. In terms of the macrosystem, the part that affects students when it comes to increasing their health condition is culture or customs, religion or beliefs, wisdom and government regulations, and school policies and regulations.

Comprehensive School Health is an integrated and continuous planning program between school affiliates, school activities and the school health service in order to improve the students' physical health, social well-being, and education. This program involves the school community and family support that focuses on shaping the student's behaviour. This development model will form a group process, and it is expected that the processed group will help in the making of a change in the school children's behaviour when it comes to selecting safe and healthy food.

The nurses comprehensively applied KOGUSIGA using intervention strategies in order to improve the food safety of the students. The improvement of the food safety of the students can be seen from their knowledge of food safety, attitude towards food safety, skill of food safety, nutritional fulfilment and the students' nutritional status. The expected health improvement happens gradually and takes time at every stage. It is based on Transtheoretical Theory, stating that there are five stages of health behaviour change: pre-contemplation, contemplation, preparation, action, and maintenance. All five stages are the basis of the stages of behaviour change in the concept of the KOGUSIGA model.

Eating behaviour and nutritional intake is affected by several factors, including parenting, portions, drink consumption, choice of food (such as vegetarian), eating behaviour and eating frequency (The Academy of Nutrition and Dietetics, 2014). Parenting is very influential on a child's eating behaviour. Sometimes parents let their children not to consume the vegetables served, but although they know that vegetables are extremely important, the parents do not to force their children and prefer to give foods that they like, such as snacks. The

consumption of fruits and vegetables is capable of decreasing the risk of disease and death (Arbury, Jacklitsch, Farquah, Hodgson, & Lamson, 2014). Both attitudes, being too stern and too tolerant, become obstacles for parents making their children become accustomed to consuming fruits and/or vegetables, minimising unhealthy snacks and spending more time eating with their children. Consequently in applying KOGUSIGA model, the processed group is conducted through some activity to fulfill safe and balance nutrition that are fun and enjoyable to students, teachers and parents. The KOGUSIGA intervention process is a form of cultivating an atmosphere to create a social environment that encourages the students to behave as expected: displaying better food safety consumption behaviour.

CONCLUSION

The results of the study show that the KOGUSIGA model was proven to significantly improve the parents' knowledge and skills in the intervention group. The KOGUSIGA model is a method of collaborative health education involving cooperation from all parts of the school. The KOGUSIGA model can be a variation of a nursing intervention, which can be integrated by way of the method of health education as a preventive and promotive effort of the School Health Unit (UKS). One main weakness was that the respondents were not randomly selected.

Based on the results of this research, community nurses and school nurses are needed. The implication of this research is to initiate the provision of school nurses to run the nursing care program, using a community nursing intervention to improve food safety in particular and school age children health in general. It was advised, directed to the Minister of Health, the Minister of Education and Primary and Secondary Schools, the Minister of Religious Affairs, and the Ministry of Internal Affairs as the regulators, that the program of UKS can increase the role of the school nurse by empowering nurses from Puskesmas as the implementers of the school health program.

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Original Research

Self-Care Training Improves the Attitudes and Skills of Caregivers for Children with Physical Disability

Warti Ningsih[1], Purwanta Purwanta[2] and Sri Hartini[2]

[1] Master of Nursing Student, Medical Faculty, Gadjah Mada University, Sleman, Indonesia
[2] Department of Nursing, Medical Faculty, Gadjah Mada University, Sleman, Indonesia

ABSTRACT

Introduction: The physical condition of a child with physical disabilities makes them dependent on others. Carers are the closest to children with physical disability and must have the ability to assist and teach children to do self-care activities. This study was aimed to determine the effect of self-care training on the knowledge, attitudes and skills of caregivers about the care of children with physical disability.

Methods: The experiment was pre-experimental with one group pre-test-post-test design. The study was conducted on 23 caregivers who experienced caring of children with physical disability. The research instruments are Knowledge and Attitude of Self Care on Children with Physical Disability Questionnaire and Observation Sheet of Self Care on Children with Physical Disability, which have tested the validity and reliability to measure knowledge and attitude. Skill observation uses a check list with the validity test of expert opinion. Training on self-care using lecture, audiovisual, practice and discussion methods was conducted in two sessions on different days with 120 minutes per session. Data analysis used Paired Sample T-Test with significance level <0.05.

Results: Self-care training significantly influenced caregivers' attitude (p = 0.038) and skill (p = 0.002), but training has no effect on caregivers' knowledge (p = 0.225).

Conclusion: Self-care training improved attitudes and skills of caregivers for children with physical disability, but did not affect caregivers' knowledge.

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self-care training; caregiver; children with physical disability; knowledge; attitude; skill

CONTACT

Warti Ningsih
warti_ns@yahoo.com
Medical Faculty, Gadjah Mada University, Sleman, Indonesia

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INTRODUCTION

According to WHO, disability is a limitation or inability to perform an activity in a way that is within the range considered normal for humans, largely due to decreased ability (Barbotte and Chau, 2011). Globally, WHO estimates the number of children with disabilities as about 7-10% of the total child population. According to 2007 National Statistics Agency data, there are 8.3 million children with disabilities among a child population of nearly 83 million in Indonesia, or about 10%. Based on Social Protection Program Data Collection (Pendataan Program Perlindungan Sosial/PPLS), in 2011 there were 130,572 children with disabilities from poor families, including physically disabled children (32,990 children); children with hearing impairment, speech disorder and physically disabled (4,242 children); and children with hearing impairment, speech disorder, blind, and physically disabled (2,991 children). The data are spread across Indonesia with the highest proportion in Central Java, East Java, and West Java (Riskesdas, 2013). Infants and children with physical disabilities such as cerebral palsy always show difficulty in performing daily activities. This is related to their difficulty to move and positioning their body similar to the limitations in other neurological damage (Chung, et al., 2008). Difficulties often faced by children in routine activities include bathing, morning activities (using cutlery at breakfast, wearing clothes and school supplies, or leaving for school on their own), afternoon activities (changing clothes and doing school work), meal time, play, leaving the house, gathering with family, physical activity and recreation (Kling, et al, 2010).

Schools for children with physical disabilities (YPAC) in Surakarta are classified into two divisions, that is the SLB D for physically disabled children and SLB D-1 for the physically and mentally disabled children. The mental condition of children was determined by a team of psychologists who had worked with YPAC. The divisions were made because the ability to learn in children with mental disabilities is different from those who only experience physical disabilities.

According to interview data conducted on 12 parents, parents did not know how to teach their children to take care of themselves and had never attended training about it. They said they only found out about it from friends, relatives, therapists and by reading. Parents also said children needed more help in eating, dressing, bathing, toileting and they couldn't bear to see their child's condition. So, even though they felt tired, they tried to enjoy it. Based on observation, there were five children who had uncleaned teeth, five children had dirty hair, four children were sweaty, not tidy and had body odor among 10 children with physical disability.

Education is a combination of learning experiences designed to help individuals and communities in improving their health through increased knowledge or influencing their attitudes and behaviors (WHO, 2015). In Heubner and Milgrom's (2014) study, which was conducted by providing parental training consisting of the provision of materials related to the importance of toothbrushes, practices and discussions for 90 minutes, there were significant changes before and after intervention in the self-confidence, attitude and self-efficacy of parents. This study also showed that the training of parents improved their caring ability, which would be good for the children.

This study was aimed to determine the effect of self-care training on the knowledge, attitudes and skills of caregivers about the care of children with physical disability.

MATERIALS AND METHODS

The research was held at the Foundation of YPAC Surakarta. It was chosen because YPAC Surakarta is the only foundation that runs an Exceptional School for Physical Disabilities (SLB D) where parents have little knowledge about child self-care with physical disability and no training on self-care. The study was held from March to April 2017 and consisted of pre-test from 13 until 26 March, 2017, intervention from 29 until 30 March, 2017, and post-test from 17 until 30 April, 2017.

The population in this research is 26 parents with physically disabled children without mental disorder, limited to children with moderate and light physical disability. The sample is caregivers who attend full sessions, including pre-test, intervention and post-test. Criteria selection of disability level was based on the classification of social service provisions. The sampling technique in this research was determined by total sampling technique. The study was a pre-experimental with a one group pre-test-post-test design without control group. The sample is 23 caregivers. There are three caregivers who were excluded from this study because they refused to be respondents, could not attend the intervention session or the intervention sessions were attended by two different caregivers for the same child on different days.

Research interventions are self-care training for caregivers with physically disabled children by providing materials, videos, demonstration and discussion. The pre-test was conducted within two weeks, followed by two sessions of intervention which consisted of 120 minutes per session on different days. The questionnaire was given directly after a full session of intervention.

The material given in the first session of intervention was about self-grooming, dressing and eating and, in the second session of intervention, for bathing and toileting. For effectiveness, respondents were divided into two groups consisted of 13 and 11 caregivers based on the agreement of the time chosen by the respondents. Material was provided by a certified trainer as a speaker and a perception equation was held beforehand between speaker and researcher.

The training was conducted for two sessions with 120 minutes per session. The session consisted of 30 minutes of material provision by the trainer, 15 minutes video presentation, 45 minutes independent practice and 30 minutes discussion.

The data collection was assisted by research assistants. Interclass correlation coefficient was used as inter-rater reliability of 12 observers. The average agreement between raters is 0.998, which means a very good accuracy on assessment object, and the consistency of a rater is 0.972, which means that the rater is very consistent in the assessment of the assessed object.

The data collection instrument is Knowledge and Attitude of Self Care on Children with Physical Disability Questionnaire, which has been tested for validity and reliability. There are 18 questions for the assessment of knowledge and 20 statements for a valid attitude assessment with a reliability value of 0.673 and 0.818, respectively. The skill was assessed by Observation Sheet of Self Care on Children with Physical Disability which has been tested for validity by expert opinion, and observation by 12 raters that has been tested for reliability with intraclass correlation coefficients (ICC) by observing five similar objects. The statistical test result achieved average agreement inter-rater of 0.998 while for an individual rater the consistency is 0.972.

Prior to the research, research assistants collected the pre-test data using questionnaire by going to the respondent's house to assess the knowledge and attitudes of how to teach self-care in children. The caregivers' skills data were collected by observing the skills of how to teach self-care in children with physical disability. Two weeks after intervention,

post-test data was collected with a home visit by a different research assistant.

The effect of self-care training on caregivers' knowledge, attitudes and skills on self-care was analyzed using mean values between pre-test, post-test and standard deviation. The normality test was held by using Shapiro Wilk with the result of knowledge and attitude, and skill scores being 0.784, 0.478 and 0.417, respectively. It is concluded from the values that all data are normally distributed because of the significance value >0.05. The data were analyzed using Paired Sample T Test to determine the effect of self-care training on caregivers' knowledge, attitude and skill with confidence level 95%.

RESULTS

Characteristics of respondents consisted of child demographic data and caregiver demographic data, showing that more than half the children were boys (52.17%), aged 11-15 years (56.6%) with average age of 10.18 years with standard deviation 2.07. Most of the children were in Grade 2 (26.9%) and had moderate disabilities categories with 73.91%. Most of the caregivers were female of whom mothers of the children accounted for 78.26% and more than half had senior high school as educational level (56.51%). Almost half of the respondents were aged 31-40 (47.83%) with average age 41.4 years and most of them were housewives (69.57%). Based on information and participation in training on self-care of children with physical disability, more than half (69.57%) had not received information about children's physical disability care before and 82.61% had never attended self-care training.

The description of knowledge, attitude and skill was determined by a cutoff point using normative value that is the mean of pre-test because the data were normally distributed. Based on Table 2, almost half of the caregivers had good knowledge before training (47.8%) and this increased after training (69.6%). The caregivers' attitudes increased from 56.5% to 82.6% after training as well as the skills, which increased from 43.5% to 95.7%.

The characteristics of caregivers including sex, education level, occupation and relationship with children, had no effect on knowledge, attitude and skill of caregivers after receiving self-care training on children with physical disability (Table 3).

Based on Table 4, there are four questions items that had decreased score after the training; the declining scores were on the questions about definition of self-care, bath stages, taught during toileting and toileting tools. There are two item questions that were answered correctly before and after training, which are about equipment for bathing and tools for dressing and dressing.

Based on Table 5, there are 10 item statements that were 100% answered agree after training, namely, the statement about baths must be with running water, using soap on the whole body, introducing shirt front and back, praising the child if possible, using the bathroom for toileting, teaching handwashing with soap after toileting, holding a spoon and trying other ways while eating, providing light cutlery during exercise, and teaching to chew food before swallowing.

There are some item statements which did not change after self-care training; the attitude of bathing without using soap, teaching children how to clean after toileting, teaching children to drink with a straw, and providing a special table for children. Other attitudes increased after training.

Almost all of the caregivers' skills increased after self-care training. The only skill decrease after self-care training was the skill about teaching children how to choose clothes. There are some skills that previously only few caregivers had which all subsequently acquired (100%): the skills of teaching to dry the body after bathing, undressing, cleaning after toileting, exiting the bathroom, washing hands after bowing, mouth, holding and drinking from the cup, and wearing the upper garment. The description of skills performed by the caregivers of children with physical disabilities before and after self-care training is shown in Table 6.

The effectiveness of the training process based on the respondents' responses is shown in Table 7. The results of the evaluation of the training process showed no respondents who rated very less or less in the training process. The results showed the training time is sufficient (13.1%), mostly judging both in terms of training facilities and training time with 78.3%, and more than half rated very good on training benefits with 60.9%. The effects of self-care training on knowledge, attitudes and skills were analyzed by paired sample t test.

Based on Table 8, the effect of self-care training on the knowledge, attitudes and skills of the caregiver by using paired sample t test showed that the training had an effect on the attitude and skill of the caregiver with respective values of (p 0.038) and (p 0.002) with 95% significance level. The training did not affect the caregivers' knowledge (p 0.225) although there was a slight increase in mean value with differentiation of 0.826 where t counts showed 1.249 smaller than t table, which means self-care training had no effect on caregivers' knowledge.

DISCUSSION

The study discussion describes the effect of self-care training on the response of physically disabled children's caregivers in training, knowledge, attitudes and skills. The discussion further reviews the correlation between the assessment's aspects with respondents' characteristics and analyzes supporting factors to determine the research intervention's effectiveness.

Almost half (47.8%) of caregivers' knowledge before and after physical disability children's self-care training is good, and the knowledge increased in the majority (69.6%) of caregivers after training. The

Table 1. Distribution of Respondents of Children and Caregivers Meeting the Research Criteria at YPAC Surakarta March-April 2017 (n= 23)

Category	Child			Caregivers		
	f	%	Mean (SD)	f	%	Mean (SD)
Sex						
Male	12	52.17		3	13.04	
Female	11	47.83		20	86.96	
Ages						
6-10 year	10	43.5	10.87 (2.07)			
11-15 year	13	56.5				
16-20 year						
21-30 year				1	4.35	
31-40 year				11	47.83	41.43 (7.54)
41-50 year				9	39.13	
>50 year				2	8.71	
Class						
I	5	21.74				
II	6	26.09				
III	4	17.39				
IV	3	13.04				
V	4	17.39				
VI	1	4.35				
Disabilities Categories						
Moderate	17	73.91				
Mild	6	26.09				
Level of education						
Primary School				5	21.74	
Junior High School				1	4.35	
Senior High School				13	56.51	
Diploma				2	8.70	
Bachelor				2	8.70	
Occupational						
House wife				16	69.57	
Private				3	13.04	
Entrepreneur				4	17.39	
Relation with Children						
Mother				18	78.26	
Father				2	8.70	
Grandmother				2	8.70	
Brother				1	4.34	
Getting information about self-care						
Already				7	30.43	
Not, yet				16	69.57	
Have training about self-care						
Ever				4	17.39	
Never				19	82.61	

caregivers' knowledge is good because some (30.43%) of them had already obtained information about self-care on physically disabled children from school and other sources. Based on research by Tristani et al. (2017), 70% of parents have sought to find sources of information about physical activity for children with physical disability through websites using common sources to increase their knowledge.

In a UNICEF study (2014), among 247 mothers, 65% of mothers had completed their primary education and 81% of parents with high school education levels had the knowledge and readiness for education of their children at home increased. This is in accordance with research result which finds that the highest education level of caregivers (56.51%) is Senior High School.

The older the person's age, the better the mental development process, but, at a certain age, the increase in mental development process is not as fast as in their teens. In addition, a person's memory is affected by age. Therefore, the age of a person can affect the acquisition of obtained knowledge, but, at certain ages, the ability to accept or remember will be reduced. The knowledge of 40-year- olds will be different from the current knowledge of 60-year-olds (Notoatmodjo, 2007). The increase in the caregivers' knowledge is less significant because the average age of caregivers is 41.43 years, where 47.83% are aged 31-40 years.

The decrease of correct answers to some questions on knowledge was also due to the fact that most caregivers (47.83%) are aged 31-40 years, at which point there is difficulty in the process of remembering. According to Aizpurua, et al. (2009), the brain is particularly vulnerable in long-term memory processes as age grows. In this study, post-

Table 2. Distribution of Knowledge Level Description, Attitude and Skills of Caregivers Before and After Self-Care Training (n= 23)

Variable	Before		After	
	f	%	f	%
Knowledge				
Good ≥13.17	11	47.8	16	69.6
Less <13.17	12	52.2	7	30.4
Attitudes				
Positive ≥59.57	13	56.5	19	82.6
Negative <59.57	10	43.5	4	17.4
Skills				
Good ≥26.74	10	43.5	22	95.7
Less <26.74	13	56.5	1	4.3

Table 3. Analysis of Chi Square Test Characteristics of Child Caregivers with Physical Disability with Knowledge, Attitude and Skills (n = 23)

Respondents' Characteristics	Knowledge			Attitudes			Skills		
	Good f (%)	Less f (%)	p value	Positive f (%)	Negative f (%)	p value	Good f (%)	Less f (%)	p value
Sex			0.907			0.435			0.692
Male	2 (8.7)	1 (4.3)		2 (8.7)	1 (4.3)		3 (13.1)	0 (0)	
Female	14(60.9)	6(26.1)		17(73.9)	3 (13.1)		19(82.6)	1(4.3)	
Level of education			0.315			0.899			0.083
Under Senior High School	4 (17.4)	3(13.0)		6 (26.1)	1 (4.3)		7 (30.4)	0 (0)	
Senior High School	10(43.5)	2 (8.7)		10(43.5)	2 (8.7)		12(52.2)	0 (0)	
Bachelor	2 (8.7)	2 (8.7)		3 (13.1)	1 (4.3)		3 (13.1)	1(4.3)	
Occupational			0.360			0.619			0.796
Housewife	11(47.8)	5(21.7)		14(60.9)	2 (8.7)		15(65.2)	1(4.3)	
Private	3 (13.1)	0 (0)		2 (8.7)	1 (4.3)		3 (13.1)	0 (0)	
Entrepreneur	2 (8.7)	2 (8.7)		3 (13.1)	1 (4.3)		4 (17.4)	0 (0)	
Relationship			0.470			0.413			0.925
Parents	14(60.9)	6(26.2)		17 (74)	3 (13.1)		19(82.7)	1(4.3)	
Grandmother	1 (4.3)	1 (4.3)		1 (4.3)	1 (4.3)		2 (8.7)	0 (0)	
Brother	1 (4.3)	0 (0)		1 (4.3)	0 (0)		1 (4.3)	0 (0)	

test was conducted two weeks after training and there was no intervention in the form of recall about the materials, but the training equipped caregivers with the module.

The questions that the caregivers found difficult to answer were more about theories, such as the definition of self-care and the bath stages and what is taught during toileting. In the choice of answers, they used words that were less familiar and also ambiguous because they related to caregiver habits. Information will be easy to remember if using the traits or characteristics typical of the stimulus (Bhinetty, 2008). There is no distinctive form of training module, so the parents were less interested to read back on the modules that were being given.

Before the training, over half (56.5%) of the caregivers already had a positive attitude and this increased after the training. Parental awareness in guiding children with physical disability and preparing them to be able to engage in activities independently could form a positive attitude in the parents (Dziubanek, et al., 2013).

This is evident from the enthusiasm of caregivers in training indicated by their involvement in following the training process. The response of the training process becomes very important to determine the success in transferring a material so that participants are able to understand, determine their attitude, be responsible in applying it and be able to make someone become more creative (Campbell, 2010 cited in McMahon and Archer, 2010).

Caregivers participated in the training because they saw that the training was very useful for their lives, as illustrated by the questionnaire result where the benefits of the training became the best judgment in that more than half of (60.9%) the caregivers responded very good to the benefits of training aspect. In line with Fickert and Ross, (2012), activities that have direct implications on a person are likely to be the reason to join the education program. This indicates the appeal of training because the respondents felt that the training materials were what they needed in daily life to teach children how to take care of themselves. In line with Huebner and Milgrom's research results (2014), the benefits of intervention in their lives became the motivation of parents in joining the training program.

Before training, almost half (43.5%) of the caregivers' skills were good and, after training, about 95.7% of the caregivers' skills in teaching self-care to children with physical disability became good. In

Table 4. Overview of Knowledge Before and After Self-Care Training in Physically Disabled Child's Caregiver (n= 23)

Question	Before		After	
	Right f (%)	False f (%)	Right f (%)	False f (%)
1. Definition of self-care	19 (82.6)	4 (17.4)	7 (30.4)	16 (69.6)
2. Self-care benefits	19 (82.6)	4 (17.4)	22 (95.7)	1 (4.3)
3. Factors that do not affect self-care	11 (47.8)	12 (52.2)	18 (78.3)	5 (21.7)
4. Factors that affect self-care	11 (47.8)	12 (52.2)	17 (73.9)	6 (26.1)
5. Understanding the bath	18 (78.3)	5 (21.7)	20 (86.9)	3 (13.1)
6. Step by step bathing	7 (30.4)	16 (69.6)	5 (21.7)	18 (78.3)
7. Equipment for bathing	23 (100)	0 (0)	23 (100)	0 (0)
8. Noticed in bathing activities	20 (86.9)	3 (13.1)	21 (91.3)	2 (8.7)
9. Dressing activities	18 (78.3)	5 (21.7)	21 (91.3)	2 (8.7)
10. Purpose of makeup and dressing	17 (73.9)	6 (26.1)	20 (86.9)	3 (13.1)
11. Stages of dating	14 (60.9)	9 (39.1)	17 (73.9)	6 (26.1)
12. Tools to practice dressing up and dressing	21 (91.3)	2 (8.7)	21 (91.3)	2 (8.7)
13. What is taught in defecation/urination	20 (86.9)	3 (13.1)	18 (78.3)	5 (21.7)
14. Tool for toileting	19 (82.6)	4 (17.4)	17 (73.9)	6 (26.1)
15. Purpose of toileting activities	19 (82.6)	4 (17.4)	20 (86.9)	3 (13.1)
16. Purpose of eating	10 (43.5)	13 (56.5)	17 (73.9)	6 (26.1)
17. What a nanny should not do when the child eats	15 (65.2)	8 (34.8)	18 (78.3)	5 (21.7)
18. What to consider when eating	22 (95.7)	1 (4.3)	20 (86.9)	3 (13.1)

Table 5. Overview of Attitude Before and After Self-Care Training in a Physically Disabled Child's Caregiver (n= 23)

Attitudes Statement	Before		After	
	Agree f (%)	Disagree f (%)	Agree f (%)	Disagree f (%)
1. Help the child bathe with wipes	3 (13.1)	20 (86.9)	9 (39.1)	14 (60.9)
2. Bathing with water does not use soap	2 (8.7)	21 (91.3)	2 (8.7)	21 (91.3)
3. Dry the body with a towel after bathing	11 (47.8)	12 (52.2)	7 (30.4)	16 (69.6)
4. Bathing with running water	22 (95.7)	1 (4.3)	23 (100)	0 (0)
5. Using soap in all parts of the body	19 (82.6)	4 (17.4)	23 (100)	0 (0)
6. Introduce the front and back of the shirt	23 (100)	0 (0)	23 (100)	0 (0)
7. Involve children in dress	7 (30.4)	16 (69.6)	2 (8.7)	21 (91.3)
8. Praise the child if you can	19 (82.6)	4 (17.4)	23 (100)	0 (0)
9. Give opportunity to choose clothes	21 (91.3)	2 (8.7)	23 (100)	0 (0)
10. Teach finding the way to the bathroom if they want to defecate/urinate	21 (91.3)	2 (8.7)	23 (100)	0 (0)
11. Teach hand washing with soap after defecation/urination	20 (86.9)	3 (13.1)	23 (100)	0 (0)
12. Tell others when they want defecation/urination	7 (30.4)	16 (69.6)	6 (26.1)	17 (73.9)
13. Teach your child how to make a bath	2 (8.7)	21 (91.3)	2 (8.7)	21 (91.3)
14. Teach opening and closing clothes during defecation/urination	21 (91.3)	2 (8.7)	22 (95.7)	1 (4.3)
15. Hold the spoon and try other ways to eat	20 (86.9)	3 (13.1)	23 (100)	0 (0)
16. Provide light cutlery during exercise	20 (86.9)	3 (13.1)	23 (100)	0 (0)
17. Teach children to drink with a straw	4 (17.4)	19 (82.6)	4 (17.4)	19 (82.6)
18. Cleaning the mouth before the child finishes eating	11 (47.8)	12 (52.2)	6 (26.1)	17 (73.9)
19. Provide special tables and chairs for children	10 (43.5)	13 (56.5)	10 (43.5)	13 (56.5)
20. Teach to chew food before swallowing	22 (95.7)	1 (4.3)	23 (100)	0 (0)

caring for children, mothers have more ability than the father. The mother's ability to provide support and action on the development of children is better. Mothers simply use their experience and cultural values in caring for the child (Unicef, 2014). Mother dominates in this study and the increase of skill to become good is because most of the respondents are mothers (78.26%).

The parenting skills that changed considerably after the training were in the activities of teaching to regulate the temperature of the water, cleaning the closet, putting clothes in the closet, buttoning clothes, zipper closing, wearing socks, wearing shoes and tidying clothes. After training, all self-care activities were taught to children with physical disability.

The challenge of physically disabled children in dressing activities is how they manage positions to perform these activities. Difficulties that are often experienced include wearing underwear, wearing socks and shoes. The clothes difficult for children with a physical disability to wear are skirts, underwear and uniforms (Kabel, et al., 2017).

Kling, et al. (2010) showed the most difficult routine for children with a physical disability is bathtime. Based on information, parents still find difficulty to find a washing tool for the child's hair,

Table 6. Descriptions of Before and After Skills Self-Care Training of a Physically Disabled Child's Caregiver (n= 23)

Educational Skills Items in..	Before		After	
	Done f (%)	No f (%)	Done f (%)	No f (%)
1. In the bathroom	19 (82.6)	4 (17.4)	22 (95.7)	1 (4.3)
2. Take a shower	20 (86.9)	3 (13.1)	22 (95.7)	1 (4.3)
3. Preparing water	14 (60.9)	9 (39.1)	18 (78.3)	5 (21.7)
4. Adjust the water temperature	10 (43.5)	13 (56.5)	16 (69.6)	7 (30.4)
5. Adjust the flow of water	17 (73.9)	6 (26.1)	18 (78.3)	5 (21.7)
6. Cleaning all body parts	19 (82.6)	4 (17.4)	22 (95.7)	1 (4.3)
7. Dry the body after bathing	21 (91.3)	2 (8.6)	23 (100)	0 (0)
8. Exit the bathroom	17 (73.9)	6 (26.1)	21 (91.3)	2 (8.6)
9. In the bathroom when you want BAB / BAK	18 (78.3)	5 (21.7)	21 (91.3)	2 (8.6)
10. Uncover the underwear	17 (73.9)	6 (26.1)	23 (100)	0 (0)
11. Positioning yourself in the toilet	19 (82.6)	4 (17.4)	21 (91.3)	2 (8.6)
12. Cleaning yourself after the BAK	19 (82.6)	4 (17.4)	23 (100)	0 (0)
13. Cleaning after BAB	17 (73.9)	6 (26.1)	22 (95.7)	1 (4.3)
14. Clean the closet	11 (47.8)	12 (52.2)	18 (78.3)	5 (21.7)
15. Make clothes after BAB / BAK	17 (73.9)	6 (26.1)	22 (95.7)	1 (4.3)
16. Exit the bathroom	18 (78.3)	5 (21.7)	23 (100)	0 (0)
17. Wash hands after BAB / BAK	19 (82.6)	4 (17.4)	23 (100)	0 (0)
18. Preparing food	15 (65.2)	8 (34.8)	17 (73.9)	6 (26.1)
19. Open the food cover	15 (65.2)	8 (34.8)	17 (73.9)	6 (26.1)
20. Using cutlery (plates, spoons, forks)	22 (95.7)	1 (4.3)	22 (95.7)	1 (4.3)
21. Put food in cutlery	17 (73.9)	6 (26.1)	20 (86.9)	3 (13.1)
22. Put food into the mouth	21 (91.3)	2 (86)	23 (100)	0 (0)
23. Chew food	21 (91.3)	2 (8.6)	22 (95.7)	1 (4.3)
24. Swallowing food	21 (91.3)	2 (8.6)	22 (95.7)	1 (4.3)
25. Spend the food	19 (82.6)	4 (17.4)	22 (95.7)	1 (4.3)
26. Hold and drink from a cup	22 (95.7)	1 (4.3)	23 (100)	0 (0)
27. Choosing clothes	15 (65.2)	8 (34.8)	14 (60.9)	9 (39.1)
28. Take the clothes from the closet	13 (56.5)	10 (43.5)	15 (65.2)	8 (34.8)
29. Wear upper garment	14 (60.9)	9 (39.1)	23 (100)	0 (0)
30. Buttoning clothes	10 (43.5)	13 (56.5)	15 (65.3)	8 (34.8)
31. Wear underwear	14 (60.9)	9 (39.1)	22 (95.7)	1 (4.3)
32. Closing the zipper	12 (52.2)	11 (47.8)	17 (73.9)	6 (26.1)
33. Wear socks	11 (47.8)	12 (52.2)	20 (86.9)	3 (13.1)
34. Wear shoes	12 (52.2)	11 (47.8)	18 (78.3)	5 (21.7)
35. Tidy clothes	13 (56.5)	10 (43.5)	20 (86.9)	3 (13.1)
36. Take off the upper shirt	19 (82.6)	4 (17.4)	21 (91.3)	2 (8.6)
37. Unfold underwear	17 (73.9)	6 (26.1)	22 (95.7)	1 (4.3)

vibrating toothbrush, and a special chair to change the position of the body when the child is in the bathroom.

Difficulties often experienced in toileting activities by children with physical disability is the difficulty of moving and positioning themselves in the closet, needing a special seat for them to move. The difficulties that are often experienced by children having incontinence are in opening underwear before toileting, difficulty in cleaning after toileting and difficulty closing zippers (Noble, 2014).

Self-care training for caregivers of children with physical disability does not have a significant effect on knowledge where the p value is 0.225. It can be seen from the mean value, that there less significant increase from before and after training, i.e. 13.17 to 14.00, where the difference test shows a difference mean of 0.826 with value t count 1.249, smaller than t table, 2.0739, which means that the training does not have a significant influence on knowledge.

Less knowledge is increased due to the giving of materials done in the classroom where the information is given by the trainer to some people in front of the class. According to Vahdaniya, et al. (2015), giving the material in the class is less likely to increase knowledge compared with telling stories.

The study of the instruments of knowledge assessment has become a concern as a result of caregiver knowledge being insignificant. According to Nunally (1978 cited in Widhiarso, 2005), instruments that have a reliability value <0.7 are less adequate as a measuring tool. In this research, the reliability of the knowledge instrument questionnaire is 0.673, which means that the instrument is less consistent to be used as a measuring tool; this happens because it is difficult to find the subjects for a validity and reliability test. Testing the validity of reliability was only followed by 34 people out of 30 question items with only 18 valid questions. Of the 18 questions, there were three (16.7%) questions that experienced a decrease in mean value after self-care training, namely, the question of the definition of self-care, bath steps and toileting tools. There was one question

Table 7. Caregiver Response to the Training on Caring for a Physically Disabled Child March-April 2017 (n= 23)

No. Item	f (%)					Total
	Very Less	Less	Sufficient	Good	Very Good	
Preparation	0 (0)	0 (0)	0 (0)	11 (47.8)	12 (52.2)	23 (100)
Training Facilities	0 (0)	0 (0)	1 (4.3)	18 (78.3)	4 (17.4)	23 (100)
Training Materials	0 (0)	0 (0)	1 (4.3)	10 (43.5)	12 (52.2)	23 (100)
Training Media	0 (0)	0 (0)	1 (4.3)	12 (52.2)	10 (43.5)	23 (100)
Trainer	0 (0)	0 (0)	1 (4.3)	14 (60.9)	8 (34.8)	23 (100)
Training Benefits	0 (0)	0 (0)	0 (0)	9 (39.1)	14 (60.9)	23 (100)
Training Time	0 (0)	0 (0)	3 (13.1)	18 (78.3)	2 (8.7)	23 (100)

Table 8. Effects of Self-Care Training on Knowledge, Attitudes and Skills of Caregivers Regarding the Care of a Physically Disabled Child (n= 23)

Outcomes	Min	Max	Mean (SD)	t (df)	p Value
Knowledge					0.225
Pretest	9	18	13.17 (2.443)		
Posttest	8	17	14.00 (2.195) 0.826		
Pretest-Posttest			(3.172)	1.249 (22)	
Attitudes					0.038*
Pretest	37	71	59.57 (6.451)		
Posttest	56	68	62.61 (3.905) 3.043		
Pretest-Posttest			(6.595)	2.213 (22)	
Skills					0.002*
Pretest	4	37	26.74 (7.794)		
Posttest	26	37	33.17 (3.537) 6.435		
Pretest-Posttest			(8.659)	3.564 (22)	

T table value with df (22) = 2.0739 with significance level 95%

that did not change after the training, which was about equipment for bathing.

Self-care training improves the attitude of caregivers for children with physical disability. Based on the result of the paired sample t test, p value of 0.038 and t value 2.213 were greater than t table; this means self-care training had an effect on the attitude of the caregivers. In the Kling, et al. (2010) study, after training on supportive technology for children with physical disability, there was increase in attitude of caregivers and they were able to choose a solution to their problem with the appropriate support tools.

After the training, caregivers' skills increased significantly based on the results of the paired sample t test and obtained p 0.002, which means the skills of parents were better after the training. Training can improve parenting skills more compared to those who only seek information from the literature (Kling, et al., 2010).

The success of the training in this study is based on the evaluation obtained from the caregivers, as it assessed for both the media training (52.2%), speaker (60.9%) and time and training facilities (78.3%). The improvement of caregiver skills was supported by an audiovisual learning media where parents were given the opportunity to see videos on how to teach children with physical disabilities. In addition, caregivers were given the opportunity to practice firsthand the materials that had been given by involving the child in the training activities of bathing, toileting, eating and dressing.

In a study conducted by Lehna, et al. (2013), which aimed to compare educational methods of classroom meetings, DVDs, home visits, leaflets, telephone contacts, pamphlets, and short messages on research subjects with parents with physically disabled children, visual disturbances and control groups showed the most effective method of education on such parent groups is classroom meetings, DVDs and home visits. Based on the theory of learning outcome, training is effective in improving skills. According to Bandura (1971), a person's behavior is formed from the process of observation (attentional phase), retention phase, reproduction phase and motivation to do something (motivation phase). The phases are done by parents in the training process where they observe through audiovisual and demonstration, being given the material, imitating through practice activities and then practice at home.

CONCLUSION

Almost half the knowledge before self-care training was good and, after training, the majority became good. More than half of the caregivers had a positive attitude before training and this improved to almost all after training. Self-care training for caregivers of children with physical disability could improve their attitude and skills, but did not affect their knowledge.

This study had a limited number of respondents. In future research, a greater number of respondents could be used as a more valid reference source. Better caregivers are always looking for an adequate source of information on how to help children in self-care activities. Providing facilities that enable children to run self-care activities, always give the opportunity and enables the child to perform self-care activities independently.

Health services need to pay attention to the right media in providing education, and shape the purpose according to the needs of the audience. Work with schools should include self-care training curriculum programs involving physical disability caregivers. Work should be done with stakeholders to provide facilities that help children with a physical disability to meet self-care needs, such as bathing, toileting, cutlery, dressing and dressing facilities that are easy to use for them.

Further research using more valid and reliable research instruments should be undertaken. There should be development of skills assessment tools that fit the child's physical disability-related disability. Observations need to be made on the appropriate schedule according to the child's activities.

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Original Research

Family-Based Maternal Sensitivity Model as a Strategy to Optimize Family Perception on the Role of Parents and the Growth of Infants

Diyan Indriyani and Susi Wahyuning Asih

Faculty of Health Sciences, University of Muhammadiyah Jember, Jember, Indonesia

ABSTRACT

Introduction: Family perceptions on the role of parents and the growth of infants must be seriously considered by healthcare workers since they can affect the role of family development in taking care of the babies. A family that has optimally understood the role of their development as a parent will be able to give the appropriate care for the babies.

Methods: The study aimed to find out the effects of a family-based Maternal Sensitivity Models (MSM) strategy for family perception optimization on the role of parents and the growth of infants. It used a quasi-experimental design with the samples of 50 families. The samples were obtained using purposive sampling technique. The data were analyzed using dependent t-test.

Results: It confirmed that the Family-Based Maternal Sensitivity Models (MSM) strategy significantly affects family perceptions on the role of parents with t-value 5.915 and p-value 0.000. MSM also significantly affects family perceptions on the growth infants with the t-value -11.257 and p-value 0.000.

Conclusion: Maternal Sensitivity Models (MSM) can be well applied as one of the health models provided by healthcare workers to optimize parents' perceptions and infants' growth as well as to develop a competent family in giving care for their babies.

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CONTACT

Diyan Indriyani
✉ diyanindriyani@unmuhjember.ac.id
Faculty of Health Sciences, University of Muhammadiyah Jember, Jl. Karimata 49 Jember, East Java, Indonesia

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INTRODUCTION

The birth of a baby is a process that can change the life of the family. The presence of a new family member makes the family, especially parents, have new roles, duties and responsibilities. The process is a transitional period that can provide both physical and psychological impacts on the developmental stage of the family (Wright and Leahey, 2009).The transitional period of this stage becomes the trigger factor of stress and imbalance in the family if they are not able to play their new roles as parents (Friedman, Bowden and Jones, 2010). Every family has roles related to the responsibilities which must be accomplished in order to fulfill the needs of the family.

The role of the family related to the baby is to provide infant care and to monitor infant growth (Kaakinen et al., 2015). The family has an important role to support the parents in caring for their baby. However, most parents are less skilled in caring for babies, including how to monitor their growth and development. This is consistent with the 2004 Infant Health and Development (IHDP) survey which found that parents are low-skilled in caring for their babies. Such condition is caused by many factors, such as the dominance of the role of grandmother, grandfather and other family members (Indriyani, Asmuji and Wahyuni, 2016). This phenomenon often occurs in most families in Indonesia because it relates to the culture adopted by each family (Asmuji and Indriyani, 2014). The research (Asmuji and Indriyani, 2014) recommends the importance of policy makers in formulating programs related to the empowerment of families in optimizing their parenthood role.

One of the efforts which can solve those problems is by improving the ability of families regarding a parent's role and the ability to monitor the growth of infants. Maternal Sensitivity Models (MSM), developed by the researcher, can be performed to conduct those efforts by involving the family as social support. This model shows its advantages when the family perception increases and the family is actively involved in the efforts, in which the function of infant care will be better and more appropriate (Dokken and Ahmann, 2006). The increase will lead the family to work actively and to have expertise in providing support to the infant's parents and monitoring infant growth. It will also contribute to the optimization of the health status of infants, which is actually the mother's responsibility. The involvement of the family in caring for the infant is expected to reduce infant mortality rate.

The present research is similar to the research conducted by Mendelson et al. (2013) which showed that infant-based psychological intervention could prevent postpartum depression and affect social support. However, the previous research only involved mother and baby in preventing postpartum depression while family involvement has not been performed optimally. Another similar research suggests that a continuing education program through public health nurses is important to be provided to the family, with limitation only for the families who have babies with very low birth weight (Pridham et al., 2006). Based on the background, the development of Maternal Sensitivity Models (MSM) is important to make the interventions more complete by involving the family to improve their competence in carrying out the role of parents and monitoring infant growth (Pontoppidan, 2015).

Therefore, the aim of this study was to analyze the effects of Maternal Sensitivity Models (MSM) in regards to the optimization of family perceptions on parents' role and infant growth.

MATERIALS AND METHODS

The study used quantitative research with quasi-experiment design and aimed to analyze the effectiveness of Maternal Sensitivity Models (MSM) that have been formulated to optimize the family perception of parents' role and infant growth. The study was conducted in March-June 2017 in Sumbersari and Sukorambi Districts, Jember, East Java, Indonesia.

The data collection was started by measuring the family's perceptions on parents' role and infant growth (pre-test) using questionnaires. After the pre-test, the researchers performed the implementation of Maternal Sensitivity Models (MSM) which focused on training and education about parents' role and stimulation of infant growth. It was implemented for three months with six interventions. The last stage was to evaluate the changes in family perceptions related to parents' role and infant growth (post-test).

The variables consisted of Maternal Sensitivity Models (MSM) as independent variable and family perceptions of parents' role and family perceptions on infant growth as dependent variables. The population of the study was families who have babies aged 1-12 months. The sample was 50 families taken using purposive sampling with inclusions and exclusions criteria. The inclusion criteria were families who have babies and babies living at home with parents. Meanwhile, the exclusion criteria were the baby being sick during the intervention and the husband was not at home. The instrument used was a questionnaires distribution about family perceptions on the optimization of parents' role and infant growth developed by researcher. The scoring system of the instrument used numerical data from a score of 20-100 with parameters measured being cognitive, affective and conative components. The reliability value of the questionnaire perceptions on the role of parents used Cronbach's Alpha of 0.79 and reliability questionnaire perceptions on the growth infants of 0.81. The data analysis used dependent t-test with α (alpha) value of 5% (0.05).

The study has passed ethical clearance with Number 003/KEPK/FIKES/III/2017 issued by the Health Research Ethics Committee, Faculty of Health Sciences, University of Muhammadiyah Jember on March 4, 2017. Thus, the implementation of research has also applied the principle of non-maleficence ethic where the researchers agree the time of implementation of the intervention with the families. Another ethical principle is beneficence, by applying research benefits to respondents by explaining them the benefits of intervention. Another ethical principle is also respect of human dignity by means of the researchers affording freedom to the families in thinking and deciding consciously and without applying pressure or coercion to take part or refusing participation in the present research, conducted by using informed consent. Furthermore, the family-based Maternal Sensitivity Models (MSM) approach can be seen in the figure 1.

RESULTS

Table 1 shows that the greatest number of age of family is 20-35 years old with 29 respondents (58%). The greatest number of the family profession is labor and trader with 18 respondents (36%). Table 1 also shows that the greatest number of family education background is senior high school with 32 respondents (64%).

Table 2 shows that family-based Maternal Sensitivity Models (MSM) application significantly affects family perceptions on the role of the family in infant care with p-value 0.000.

Based on the table 3, it can be seen that family-based Maternal Sensitivity Models (MSM) application also significantly effects the family perceptions on infant growth with p-value 0.000.

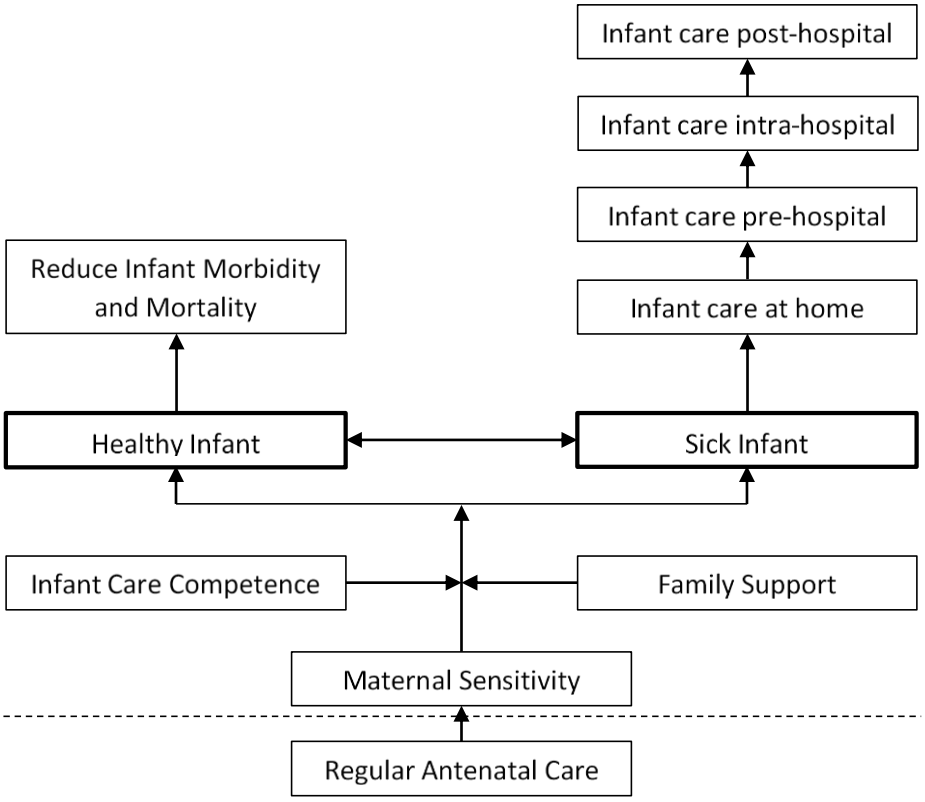

Figure 1. Family-Based Maternal Sensitivity Model in Optimization of Infant Care Competence

DISCUSSION

The family-based Maternal Sensitivity Models (MSM) have a significant effect on family perceptions on parents' role in infant care. The family-based Maternal Sensitivity Models (MSM) approach in improving family perceptions on parent's role is in accordance with nursing intervention step in Nursing Intervention Classification (NICs): designing educational programs based on family strength, identifying personal factors that impact on the success of the program (e.g., cultural values, negative experiences, time commitments, interests), facilitating family discussions on parenting methods, teaching the families about physiological, emotional and infant care, and helping the families to identify evaluation criteria for daily infant care.

The concept is supported by the results of triple parenting program interventions that shows that infant care programs which are supported by family involvement are proven to be effective in increasing family satisfaction in carrying out the role of parenting (McConnell, Breitkreuz and Savage, 2012; Williams and Hutchings, 2015). Maternal Sensitivity Models (MSM) interventions that make families as social support for other family members has formed a continuous interaction among family members in performing their roles, so that these conditions can effectively improve communication and harmony within the family. Social support of the family (physical, emotional and instrumental supports) in a parenting role has formed cognitive and affective awareness of the family members so as to perform their role (Padden et al., 2013; Pender, Murdaugh and Parsons, 2015). It is also in accordance with the results of the research conducted by Pontoppidan (2015) suggesting that family involvement programs in infant care are effective to overcome the physical and psychological problems of infants. Family involvement programs in infant care also support the success of breastfeeding (Langlois and Smith-Sharp, 2001; Nuzulia, 2011; Daniels et al., 2015; Swigart et al., 2017).

Instrumental support (such as assisting infant care, complementary roles and tasks in fulfilling the role of infant care), emotional support (such as praise, loving relationship), and information support (such as ideas and suggestions) are the key support that contributes to the role of family care. Therefore, family support is very important for families who have babies (Hamilton, 2010) . This is consistent with the research (Verhage, Oosterman and Schuengel, 2015) suggesting that family support affects the parents' role in parenting, so that it affects the baby's temperament as well. In contrast, a research conducted by Hegedus and Mullan (2015) shows that, in Australia, which is a developed country, the family support for baby care in supporting the breastfeeding process has not yet been performed optimally.

Family support is a key point in Maternal Sensitivity Models (MSM) so that family perceptions of the parent role can be increased. The family is the main social support for the developmental stage of

Table 1. Frequency Distribution of the Age, the Profession and Education Background of Families (n=50)

Demographic Data		Number	Percentage
Age	< 20 years old	7	14.0
	20-35 years old	29	58.0
	> 35 years old	14	28.0
	Total	50	100.0
Profession	Labor and Trader	18	36.0
	Farmer	11	22.0
	Civil Servants	9	18.0
	Self-employed	12	24.0
	Total	50	100.0
Education Background	Junior High School	14	28.0
	Senior High School	32	64.0
	Higher Education	4	8.0
	Total	50	100.0

Table 2. The Effects of Family-based Maternal Sensitivity Models (MSM) to Family Perceptions on Parents' Role (n =50)

Variable	Mean	Std. Deviation	Std. Error Mean	p-Value
Perceptions of the Role of Parents in Infant Care				
Pre-test	61.00	7.626	1.079	0.00
Post-test	71.80	8.497	1.202	

Table 3 The Effects of Family-based Maternal Sensitivity Models (MSM) to Family Perceptions on Infant Growth (n = 50)

Variable	Mean	Std. Deviation	Std. Error Mean	p-Value
Perceptions on infant growth				
Pre-test	60.60	7.117	1.007	0.00
Post-test	76.40	6.627	0.937	

the family with babies because there is a transition period into a new family at this stage that requires optimal support from other family members (Kaakinen et al., 2015).

The parents' role in undertaking infant care is very important because it affects the physical and mental conditions of the baby (Dokken and Ahmann, 2006; Day, Bernheimer and Weisner, 2007). The previous research shows that poor baby personality is associated with self-efficacy or parenting skills in infant care (Padden et al., 2013; Verhage et al., 2015).Therefore, it needs family support from other family members to optimally realize the parents' role (Hickey et al., 2016).Therefore, it needs powerful support from other family members in realizing the optimal parent role. Maternal Sensitivity Models (MSM) use family strength resources and family potential as key social support in enhancing the parental role so that MSM is proven to improve family perceptions on the parental role.

Another result of the present research also confirms that family-based Maternal Sensitivity Models (MSM) have an effect on family perceptions on infant growth. It becomes something that is rarely noticed by families who have babies. The family perceptions on infant growth can be well improved through family-based Maternal Sensitivity Models (MSM). This is because the support provided by the family becomes a stimulus that can improve the perceptions of other family members, so that there is an exchange of information from each family member. Also, it indicates that support given to families who have babies from other family members can improve the health status of the babies, one such is related to infant growth (Adema, Clarke and Frey, 2016).

The families who get full support from family members get many benefits for both the family and the baby. The family which supports the young mother in monitoring the growth of babies, e.g., accompanying the young mother in monitoring the height and weight and monitoring the development of infants in *Posyandu* or in other healthcare services can create harmonious and happy conditions for families.

Programs involving family members, in infant care, are also evident by studies showing that family support greatly contributes to improving infant health and lowers stress levels while undergoing infant care (Pontoppidan, 2015).

One indicator of infant health is infant growth. It is influenced by many factors, one of which is the parent role. In accordance with the related theory, it shows that psychosocial factors are the ability of parents in stimulating the development of infants, as well as motivation in caring for babies and these can affect infant growth and development. Parents who often

stimulate infant development will have a different impact on infant development than the parents who never give stimulation for infant growth (Hockenberry and Wilson, 2009).

Family perceptions on infant growth is important to be improved since it affects infant growth and development. Maternal Sensitivity Models (MSM) that make the family as the main social support of family perception about baby growth can be improved. This is due to the support provided by the family to other family members. This opinion is also supported by a meta-analysis study showing that nursing interventions given by involving families are more effective in improving parenting tasks, such as monitoring infant growth (Tanninen et al., 2015).

Nurses who involve families in providing interventions have the virtue of being able to see the potential of the family and exploiting the potential of the family in supporting other family members to fulfill their duties and responsibilities in providing infant care, including about infant growth, so that infant growth can be achieved optimally.

CONCLUSIONS

Family is major social support in realizing and improving infant health status. A family-based Maternal Sensitivity Models (MSM) approach as the main social support for other family members significantly affects the family perceptions on the parent role and infant growth.

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Original Research

Responsive Feeding-Play (Resfeed-Play) Intervention on Children Aged 6-24 Months with Malnutrition

Dwi Cahya Rahmadiyah, Agus Setiawan and Poppy Fitriyani

Department of Community Health Nursing, Faculty of Nursing, Universitas Indonesia, Depok, Indonesia

ABSTRACT

Introduction: Toddlers are at risk to health problems, one of which is malnutrition. One of the important determinants to toddlers' growth is nutrition. Giving solid foods to toddlers can be done by active/responsive feeding combined with the method that best suits the stage of playing toddlers. This paper aimed to provide an overview of the intervention of Resfeed-Play as a form of community nursing intervention on 32 children aged 6-24 months with malnutrition. Implementation of the intervention Resfeed-Play was performed in families and in society in nutrition support activities.

Methods: The method was quasi-experimental with one group pre-post-test design. The inclusion sample criterion was family with toddlers who suffered from malnutrition.

Results: The results of evaluation of Resfeed-Play shows an increase in knowledge (24.2%), attitude and skills by 30.3% and 42.4%, respectively. After intervention of six months, the mean weight gain for toddler was 0.95Kg. Based on paired sample t-test, the weight gain is significant with a P value of 0.001 (P <0.05). Resfeed-Play intervention can increase body weight in toddlers and can address the problems of malnutrition in children under five.

Conclusion: Based on the results of this study, Resfeed-Play intervention is recommended to increase community empowerment through positive activities such as post-activity nutrition in order to prevent and mitigate the problem of malnutrition in toddlers.

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CONTACT

Dwi Cahya Rahmadiyah
✉ dwicahyar@gmail.com
Department of Community Health Nursing, Faculty of Nursing, Universitas Indonesia

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INTRODUCTION

One of the objectives of the Sustainable Development Goals (SDGs) by 2030 is to end all forms of malnutrition, including achieving internationally agreed targets on stunting and wasting in under-five children and meeting the nutritional needs of young women, pregnant women and breastfeeding mothers, and parents (Nations, 2015). Based on the MDG report by The United Nations (2015), the prevalence of under-five children with malnutrition continues to decline slowly for all regions to achieve the target. According to the global projection, the proportion of under-five children who were underweight between 1990 and 2015 has achieved the MDG's targets. However, more than 90 million children under five years old, or one in seven children worldwide, are still suffering from malnutrition (United Nations, 2015).

The prevalence of national under-five children's undernutrition was 13.9% in 2014 and 18.8% in 2015. Based on the assessment of nutritional status of children under five years old (weight per age), among 69 samples of under-five children who were randomly assigned, 44.9% of children under five had good nutrition, 44.9% had undernutrition and 10.1% of children were severely malnourished. Signs and symptoms of undernutrition in the majority of children were in the yellow / red line (52.2%). Based on survey results related to the health behavior domain, it was found that the level of family knowledge about undernutrition was 39.4% unfavorable, 42.4% of under-five children had poor attitude and 54.5% of families had poor skills (Rahmadiyah, 2015).

Undernutrition problems will have an impact on delayed child growth. Undernutrition can cause children to have a greater risk of infectious diseases,

increasing frequency of disease and contributing to long-term healing. Undernutrition in the first 1,000 days of life is also associated with cognitive abilities and reduction in school and work performance (WHO, 2015). Various impacts of under-five children's undernutrition can cause them to be at risk of cognitive and physical disturbance.

The malnutrition problem among toddlers needs a comprehensive intervention including promotive, preventive and rehabilitative action as well as three levels of intervention, primary, secondary and tertiary. As a community nurse, the prevention of malnutrition has become one of the nurses' roles.

Strategies of intervention which can be used in community nursing practice for toddler groups with malnutrition include group discussion, partnership, community empowerment and other nursing complementary therapies (Pender, 2002; Stanhope and Lancaster, 2016). Based on those problems, this study used a concept model of community nursing, family nursing and health care management to overcome malnutrition among toddlers in the community. The concept model of community nursing care used community as partner (Ervin, 2002), while the model of family nursing care used family-centered nursing (Friedman, Bowden and Jones, 2003).

Based on the result of family assessment with toddlers in Srengseng Sawah Village in October 2016, randomized sample was used and showed that 44.9% toddlers are in good nutrition while 44.9% toddlers suffered from malnutrition and 10.1% toddlers suffered from severe malnutrition. The signs and symptoms of malnutrition among toddlers is shown in yellow or red in the growth and development chart (52.2%). Based on the survey related to health behavior, this has shown a poor level of family knowledge about malnutrition (42%) and 44.9% of the families did not show good health behavior. However, 60.9% of the toddlers were found with good behavior (Rahmadiyah, 2015).

Within the context of feeding, responsiveness includes offering physical assistance appropriate to the age of the child and with consideration to the child's hunger and satiety cues, feeding patiently, offering verbal encouragement to eat, trying different foods and encouraging the child if he refuse to eat, avoiding distractions during meals, and talking and making eye contact during feeding (Pan American Health Organization & World Health Organization, 2003). Studies of caregiver styles of feeding in resource-poor settings suggest that responsive feeding behaviors are associated with higher child acceptance of food (Ha et al., 2002; Moore et al., 2006; Dearden et al., 2009; Bentley et al., 2011). Caregivers have also been shown to feed children more actively during certain types of meals (Engle and Zeitlin, 1996).

Young children raised by caregivers who eat healthy foods, such as a diet rich in fruits and vegetables, are more likely to choose and prefer fruits and vegetables (Skinner et al., 2002). In contrast, children of caregivers who exhibit unhealthy dietary behaviors (i.e. diets high in refined carbohydrates and saturated fats) are likely to develop unhealthy diets themselves (Papas et al., 2009). When caregivers engage in responsive interactions with their children, they are likely to maintain the child's feeding in the short term, the clarity of expressed signals of hunger and satiety, and, ultimately, responsibility for recognizing and acting on such signals. A recent survey of health and nutritional personnel from six countries endorsed parenting practices characterized by structure, nondirective control and responsiveness as being most effective in promoting fruit and vegetable consumption among toddlers (O'Connor, 2010). The literature shows that active-responsive feeding is the basis for developing good eating behaviors and optimizing skills to organize themselves as well as self-control about food intake. Therefore, practicing active-responsive feeding is associated with ideal growth, optimal nutrition and long-term weight regulation (Harbron, Booley and Najaar, 2013).

One of the innovative interventions in this study to improve the nutritional status of toddlers in Srengseng Sawah Village was increasing active and responsive feeding with Responsive feeding and play (Resfeed-Play) intervention. This intervention included active and responsive feeding combined with playing educational games for toddlers. Active-responsive feeding can be done by the mother as a caregiver to avoid the problem of malnutrition. Feeding actively and responsively refers to a mutual relationship between toddler and mother characterized by the toddler whereby they can communicate about hungry and satisfied feelings through verbal and nonverbal cues, followed by an immediate response from their mother (Du Plessis, Kruger and Sweet, 2013). Responsiveness during feeding is defined as caregivers' prompt, contingent and developmentally and emotionally appropriate reactions to their children (Ainsworth et al., 1974; Black and Aboud, 2011). The aim of this research is to provide an overview of the implementation of Responsive Feeding and Play (Resfeed-Play) intervention in community care and nursing care in increasing weight in toddler aggregate.

MATERIALS AND METHODS

The study used quasi-experimental by one group pre-post-test design. The inclusion criterion for sample recruitment was family with toddlers who suffered from malnutrition. The sample selected in this study consisted of 32 mothers with children aged 6-24 months, the child was still breast-fed and follow up at the integrated healthcare service center (*Posyandu*) was also taken during the study period. This research was conducted in Srengseng Sawah Sub-district, Jagakarsa district, South Jakarta. Based on the nutritional status assessment of under-five children (weight per age), among 69 randomized toddler samples, 44.9% of toddlers had good

nutrition, 44.9% had undernutrition and 10.1 % had severe undernutrition. Signs and symptoms of underweight nutrition in the majority of children were in the yellow/red area in monitoring card (52.2%). Data collecting instruments consisted of questionnaires to measure knowledge, behavior and skills related to malnutrition and a weighing instrument to measure body weight of children under the age of two years old. The validity test on the questionnaires concerning knowledge, behavior and skills produced a value of 0.372-0.793 while the reliability test produced a value of 0.852. The weighing instrument to measure body weight of children under the age of two years old was hanging scales that had been calibrated. This study passed the ethical test standards for research as outlined by Faculty of Nursing Universitas Indonesia before data collection. This study used paired sample t-test for data analysis.

This research conducted responsive feeding combined with play method as the intervention. Participants were given education about responsive feeding and play methods. The variables to be measured are mother's knowledge, attitude and behavior towards responsive feeding before and after intervention. Implementation was conducted for three time periods within three months. One period was done daily for two weeks in the form of a nutrition support. After a period of implementation, the intervention was evaluated by measuring weight gain of toddlers and mother's behavior in the provision of complementary feeding (MPASI) for toddlers. Activities undertaken in the nutrition support included the mothers processing the ingredients to be food for the toddler, then, after processing the ingredients, the mothers fed their children while playing. During the nutrition support, the participants were accompanied by two facilitators in processing food ingredients into MPASI. The facilitators were health volunteers who had been trained in responsive feeding and play methods by the researcher. The facilitators played a role in assisting the toddler's mother in the processing of food ingredients, providing positive reinforcement and measuring the weight of toddlers every day during the nutrition support. In addition, the role of the facilitator was also to monitor the behavior of the infant's mother in the practice of giving complementary feeding (MPASI) through incidental home visits.

The implementation of the Resfeed-Play consisted of environmental requirements and several steps. The environmental requirements must be considered by parents in terms of the environment while active-responsive feeding is given and things that need to be considered before inviting the toddlers to play. Before parents give an active-responsive feeding, there are things that must be considered, such as the eating environment. Some environmental requirements that can be created include a pleasant eating environment, children sitting relaxed and comfortable, face contact with other family members, minimized distractions during meals, establishing a routine, and following the schedule which should be at the same time and place (Harbron, Booley and Najaar, 2013).

Some guidelines mother should pay attention to in assisting toddlers during their play include making sure toys are safe and appropriate to their age; providing toys to stimulate all the children's senses; putting the baby in various position throughout the day (e.g., stomach, side, back [if the baby can turn from supine to prone position; encouraging the use of hands and feet in play; offering some new experiences every day, encouraging to bang the toys together; giving praise more often; and reading stories for children (before nap time and bedtime) (Dixon and Stein, 2006 cited in Potts and Mandleco, 2011; Bright Futures, 2009). Mothers as a caregiver can facilitate children's signals and reciprocity through proactive preparation. Some guidelines to initiate play include the provision of age-appropriate play materials, some new and some familiar, and keeping the child in place, engaged and at liberty to act on the materials and emit signals. This proactive preparation provides a structure so the child knows what to do and can explore new options and the caregiver can provide support that expands on the child's repertoire. Guidelines for feeding and proactive preparation include establishing routines around mealtimes, such as eating in the same place and at the same time; ensuring that children are seated in a supportive and comfortable position; and exposing them to appropriate mealtime behavior, such as making healthy choices for the entire family (Black and Hurley, 2010).

RESULTS

Based on the family characteristics, the study revealed the average age of the mother is 29 years (95% CI: 26.93-31.07) with standard deviation of 5.742. The youngest age 19 years and the oldest age 44 years.

Less than half of the families surveyed, or 40.6% of them, belong to low-income families (i.e. their income is below the UMR (regional minimum wage) or less than 2.700.000 rupiah); more than half of mothers, 78.1%, have level senior high school education.

Based on Table 3, the result of the paired sample t-test showed the mean weight of toddlers before the intervention was 8.0594kg with standard deviation of 1,814. After intervention of six months, the mean weight gained was 9.009kg with standard deviation of 0.95 kg. After further analysis, there was a significant weight gain with p-value 0.001 ($p<0.05$).

Based on Figure 1, it shows that there was an increase in knowledge, behavior and skill before and after a nursing intervention. After intervention of six months, there was an increase of 24.2% in knowledge, 30.3% in behavior and 42.2% in skills.

Table 1. Distribution of Mother's Age in the Group of Malnutrition Toddlers (n=32)

Variable	Mean	SD	Min-Max	95% CI
Mother age	29	5.742	19-44	26.93-31.07

Table 2. Distribution of Family Characteristics in the Group of Malnutrition Toddlers (n=32)

Family Characteristics	Amount	Percentage
Family income		
High (≥ UMR: ≥ 2.700.000)	19	59.4
Low (< UMR: ≤ 2.700.000)	13	40.6
Mother's education		
Junior high school	5	15.6
Senior high school	25	78.1
College	2	6.3

Table 3. Distribution of Weight in the Group of Malnutrition Toddlers (n=32)

	Mean	SD	Mean Range	P-value
Weight Before	8.0594	1.814	0.95	0.001
Weight After	9.0094	1.848		

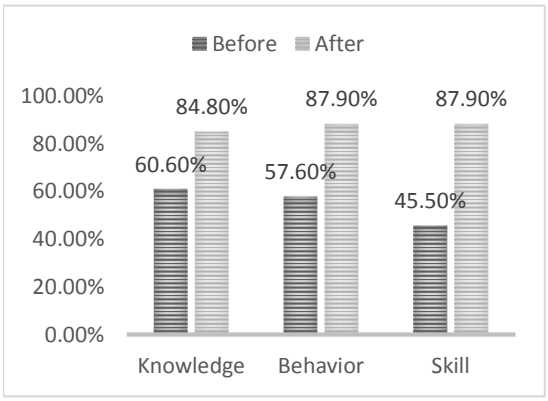

Figure 1. Frequency Distribution in a Group of Mothers and Toddlers based on Knowledge, Behavior and Skills Related to Malnutrition Before and After Intervention (n=32)

DISCUSSION

The human resources organization in *Posyandu* has formed a support group to provide healthcare service for children. These support groups consist of a health representative, known as a health volunteer, for nutrition support. These support groups served as facilitators in the nutrition support activities. The facilitators' roles in this activity were to facilitate the participant in the nutrition support activities, provide motivation to the participants in the intervention of active-responsive feeding during playing educational games with toddlers, giving advice to the participant and making regular home visits.

Both support group and self-help group had roles and functions that would complete each other in a nutrition support activity. Each group had the power to overcome the nutritional problems in the community. The role of support groups in the nutrition support activity included giving support, motivation, and encouragement to participants' nutrition support, while the role of self-help groups was in giving strength and shared experiences among participants. Both groups were part of the organization formed as nutrition support. This is consistent with the theory of organization which include working in an organizational structure, understanding and using the power and authority appropriately (Marquis and Huston, 2012). This support group was given guidance by the health professionals to maintain this nutritional program for toddlers. Support groups who were given a guidance by health professionals saw an increase of 15% in knowledge.

The implementation strategy was done by the community as a partner model. The strategy is used in this implementation involves health education, group process, partnership and empowerment (Anderson and McFarlan, 2011). Health education strategies performed in the community include health education about malnutrition, balanced nutrition, and active-responsive feeding to the toddlers in the comm

unity. This activity included primary prevention. This is in accordance with Stanhope and Lancaster, (2016) who declared that primary prevention is a prevention before illness and focused on healthy population, including general health activities and specific protection against disease.

The purpose of health education, according to Yazachew and Alem (2004), is to motivate an individual to adopt a health behavior through health promotion by providing proper knowledge and developing a positive attitude. It also helps individuals to make decisions about their health and gain confidence and skill to take the decisions (Yazachew and Alem, 2004). Based on that explanation, the purposes of education are divided into short-term goals to achieve knowledge change while medium-term goals are increase in knowledge, behavior and skill that will be changed towards healthy behavior. The long-term goals are to run health behavior in their daily life. This is in accordance with the results before and after health education which showed an increase in knowledge, attitude and skills by 24.2%, 30.3% and 42.4%, respectively.

The other implementation strategy was the group process, not only the self-help group formed by mothers who have malnutrition toddlers, but also the implementation of nutrition support activities. The groups consisted of the families who have toddlers with malnutrition and undertake activities in the nutrition support. The activities included cooking together, performing active-responsive feeding and shared experiences about how to

provide food for toddlers. The implementation of this strategy is considered as secondary prevention in the nursing community to overcome health problems. The secondary prevention emphasis is on early diagnosis and implementation to prevent the disease process (Stanhope and Lancaster, 2016). The nutrition support activities aimed to increase knowledge and awareness among parents with malnutrition toddlers, improve the autonomy to take preventive actions against malnutrition and any complication, and improve parents' ability to overcome malnutrition independently by providing and processing food properly as a prevention of malnutrition among children living in two areas in Srengseng Sawah Village.

The result showed that a self-help group for parents who have malnutrition toddlers was formed in two areas and which consisted of 19 and 13 participants (n=32). In addition, 80% of participants of nutrition support gained their weight between 1-4ozs during the first two weeks. All the participants also demonstrated how to process well-nourished food, performed active-responsive feeding every day for two weeks in the nutrition support, and developed appropriate responses. This result proposes that the short-term benefits of responsive feeding are expected to be children's increasing attention to internal signals of hunger and satiety and to eating in a competent and responsible manner. The long-term benefits of responsive parenting are enhanced psychosocial, cognitive and language competence, and the long-term benefits of responsive feeding are likely to include healthy nutrition and growth (Black and Aboud, 2011). Research is needed to examine the short and long-term impact of responsive feeding on children's growth and development.

The home visit was performed by health volunteers to monitor food processing with balanced nutrition and active-responsive feeding every day at home. In addition, these nutrition support activities also have an impact on the behavior of the mother, such as cooking a meal with balanced nutrition, feeding actively and responsively, and washing hands at home. Those were all evaluated through unplanned home visits by the health volunteer. The results are in accordance with one of the evaluation criteria mentioned by Ervin (2002) in that evaluation focused on community nursing care is to see the improvement of health status as an impact after the program was performed and to observe the changes over the course of six months to a year.

The implementation of a planned empowerment strategy includes the formation and training of a support group. This training is expected to support the malnutrition prevention activity in two areas. These support groups consist of health volunteers and public figures in the community who are empowered in order to address the problem of malnutrition experienced by the toddlers. This group serves as a facilitator for the self-help group.

Every toddler in the assisted family has performed Resfeed-Play intervention that has been taught to the previous family. The active responsive feeding provided strategies which can be done by parents included actively engaging in eye contact and talking with the children during mealtime, talking about expectations, responding to hungry and satisfied feelings, feeding the baby directly, or helping children to eat by themselves (Harbron, Booley and Najaar, 2013). This feeding was practiced in line with the theory that the average mothers from 32 toddlers were actively involved and talked to their children during mealtime. The average mothers from 32 toddlers were also making eye contact with the children during feeding. This process is in accordance with research that, within the context of feeding, responsiveness includes offering physical assistance appropriate to the age of the child and with respect to the child's hunger and satiety cues, feeding patiently, offering verbal encouragement to eat, trying different foods and methods of encouragement if the child refuses, keeping distractions to a minimum during meals, and talking and making eye contact during feeding (Pan American Health Organization & World Health Organization 2003). Studies of caregiver styles of feeding in resource-poor settings suggest that responsive feeding behaviors are associated with higher child acceptance of food (Ha et al., 2002; Moore et al., 2006; Dearden et al., 2009; Bentley et al., 2011). Caregivers have also been shown to feed children more actively during certain types of meals (Engle and Zeitlin 1996).

The strength of this study is that intervention of Resfeed-Play was a procedure of feeding the toddler which was quite easy to do, both in the family and in the community in nutrition support activities. This intervention did require the mother's patience in its implementation. The essence of this intervention was to feed the toddler with affection and patience interspersed with educative games that could stimulate the development of toddlers.

Despite there was notable improvement in the knowledge, attitudes and skills of mothers as well as increase in the weight of the toddlers, some limitation was identified. This included the selection of the village, which was not randomized since the study was conducted as part of intervention in a residential program of a community nursing specialist program. Other limitations of this study were that not all mothers were patient when feeding toddlers and had time to cook their own food for toddlers. This was because the mothers of toddlers with undernutrition were mostly housewives whereby all household chores were handled by themselves, without any household assistants or other family member helping.

Another limitation was the limited number of health volunteers involved in nutrition support. Up to this time, the health volunteers of *Posyandu* (Integrated child health services) have also been health volunteers of nutrition support. Currently, the

government has promoted health programs that require community empowerment. In these cases, health volunteers became the main representative of healthcare staff in the community to empower people in their area, which resulted in increasing their workload. This placed the workload on the health volunteers since they were also the health volunteers for *Posyandu*, larvae observation (*Jumantik*), tuberculosis, and also the contraception program. As a result of the multiple tasks and roles they did, it reduced their focus on implementing each program. Thus, the expected outcomes of each program, particularly the program of nutrition support, was not optimally done.

CONCLUSION

There was increased knowledge, behavior and skill of every support group members, mothers' group with malnutrition children, and families after performing Resfeed-Play intervention. Training programs for community representatives and implementation of nutrition support were effective activities that can be done to overcome malnutrition problems. Furthermore, increased family's independence in addressing malnutrition in children through Resfeed-Play intervention also increased children's weight after Resfeed-Play. In addition, it is expected that Public Health Centers (*Puskesmas*) can develop nutrition program activities of toddlers involving cadres of nutrition support with the implementation of responsive feeding to improve nutritional status in toddlers. *Puskesmas* can also provide ongoing guidance to nutrition support cadres and other support group members in conducting guidance, motivation and improving community spirit in overcoming malnutrition problem in toddlers.

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Original Research

Nurses Education and Motivation Towards Nursing Documentation

Devi Mediarti[1], Rehana Rehana[1] and Abunyamin Abunyamin[2]

[1] Department of Nursing Polytechnic of Health Palembang, South Sumatra, Indonesia
[2] General Hospital of Palembang BARI, South Sumatra, Indonesia

ABSTRACT

Introduction: Nursing documentation is an integral part that cannot be separated from healthcare as a responsibility and accountability of nurses. High education and motivation are needed to achieve good nursing documentation. The aim of this study was to know the correlation between education and motivation of nurses towards Intensive Care nursing documentation.

Methods: The design used was an analytical survey with a cross-sectional approach. The population was nurses in intensive care of Palembang BARI Hospital with as many as 46 nurses and 44 samples obtained with total sampling. Data were collected by questionnaire and observational and were analyzed by Chi-Square. Independent variables are education and motivation of nurses and the dependent variable is nursing documentation.

Results: There was a correlation between education (p=0.035) and motivation (p=0.040) of nurses towards nursing documentation.

Conclusion: High education and motivation of nurses influenced towards the quality of nursing education. The nursing manager of the hospital is recommended affording the opportunity to support human resources in the hospital, especially for nurses to participate in education, in accordance with the demands of legislation in nursing education, and to organize the training of nursing documentation.

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CONTACT

Devi Mediarti
devi@poltekkespalembang.ac.id
Department of Nursing Polytechnic of Health Palembang, South Sumatra, Indonesia

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INTRODUCTION

Nursing is a professional service form of basic needs given to individual health and sick conditions, which include physical disorder, psychological and social, in order to achieve the optimal health status. The basic form of fulfillment in individuals can be either improved existing capabilities, prevention, repair and rehabilitation of sick condition as perceived by individuals (Alligood and Tomey, 2006).

Nursing is an integral part that cannot be separated from the overall healthcare effort. Nursing is a study that learns of the cause of the non-fulfillment of basic human needs and makes effort to satisfy such basic human needs in response to the patient (Nursalam, 2008). Professional nursing service is based on nursing as a science process. That is, nursing care as a scientific method of nursing patients' problems – and solving these to improve patient outcomes, which should be documented (Aziz, 2003).

Nursing documentation is an activity of recording, reporting and maintenance that is associated with managing of clients in order to maintain a number of facts from an event in time (Nursalam, 2008). Documentation is evidence of recording and reporting that is owned by nurses in a useful record for the importance of clients, nurses and the medical team in providing health services on the basis of accurate and complete data written as a nurse's responsibility (Suprapto, 2013).

Nursing documentation can be used as the responsibility and accountability of the various possible problems experienced by the patient or client and consists of satisfaction or dissatisfaction of the healthcare provided (Nursalam 2008). Nursing documentation that is timely, accurate and complete is not only important to cover and protect nursing, but it is also important to help patients and clients to get better nursing care (Depkes, 1996). Implementation of nursing documentation is a measure to determine, monitor and conclude

organized nursing care services in hospitals (Setiadi, 2012).

A study in Indonesia carried out by the Department of Health Mataram West Nusa Tenggara Province in 2013 showed that 71.60% of nursing documentation was incomplete (Dinas Kesehatan Nusa Tenggara Barat, 2013). Nursing documentation in the South Sumatera province in the inpatients unit of General Hospital of Prabumulih 2012 showed that 65.62% of nursing documentation was incomplete and 34.37% of nursing documentation was complete (Zakiroh, 2013).

The phenomenon of incomplete nursing documentation was influenced by many factors, among them individual nurse's characteristics, including education, age, sex, length of service and knowledge. Psychological factors include motivation and organization factors. (Gibson and Ivancevich 2002 cited in Nursalam, 2008). The results of interviews with nurses who served in the intensive care room found that many nurses, while on duty in the room, didn't properly complete the nursing documentation.

Education influenced the implementation of nursing documentation strongly. Nurses with different levels of education will have different quality of documentation, because the higher the level of education, the cognitive abilities and skills will increase as well (Notoatmodjo, 2003).

Performance of hospitals is influenced by its nursing service. Nursing service is highly dependent on nurses' performance, in which the nurses' performances were strongly influenced by the motivation of nurses in nursing documentation. This is in accordance with Davis's opinion (1998 cited in Abdullah, 2012), who said that among the factors which may affect the achievement of nurses' performance in nursing documentation was ability and motivation.

In the results of a preliminary study conducted by researchers, data from General Hospital of Palembang BARI obtained total nurses, dental nurses and midwives throughout hospitalization amounting to 290 people. For the number of nurses who served in the Installation Intensive Care there were 46 people with a total capacity of 15 beds. Incompleteness of medical records of all inpatient status of General Hospital of Palembang BARI in 2013 was 40.03%, in 2014 it was 30%, and in 2015 31.8%. (Medical Records of General Hospital of Palembang BARI). Based on the description, the researchers were interested in conducting research with the title "Nurses Education and Motivation Towards Nursing Documentation". The purpose of the study was to know the correlation between education and motivation of nurses towards nursing documentation. The gap analysis of the study could not check the completeness of nursing documents and appropriate nursing language, because the data were collected by questionnaire.

MATERIALS AND METHODS

This study used analytic survey with cross – sectional approaches. The data in this study were obtained using a questionnaire and observation sheets and analyzed by Chi - Square. Total population in this study were all nurses who served in the Installation Intensive Care Unit of General Hospital of Palembang BARI 2016 with as many as 46 nurses and 44 samples obtained with a total sampling technique appropriate to the inclusion criteria. The inclusion criteria were: 1) willing to be a respondent, 2) not in a period of sickness, permit, or suspension, 3) being in place during research.

Independent variables were nurses' education and motivation and the dependent variable was nursing documentation. This study was conducted in the Installation Intensive Care of General Hospital of Palembang BARI between 20 – 25 April 2016.

RESULTS

The result of this study will be explained based on the information presented in the tables. The result of this study was analyzed by univariate and bivariate using Chi–Square. The result showed Respondent's Characteristics in Installation Intensive Care General Hospital, nurses' education and motivation towards nursing documentation.

Table 1 shows that nursing documentation with good category were 31 respondents (70.5%), respondents with low education were 30 respondents (68.2%). Respondents with strength motivation category were 28 (63.6%

Table 1 Distribution of Respondents' Characteristics in Installation Intensive Care General Hospital of Palembang BARI on April 2016

Characteristics	N	%
Nursing documentation		
Good	31	70.5
Not Good	13	29.5
Total	44	100
Education		
High (bachelor)	14	31.8
Low (diploma)	30	68.2
Total	44	100
Motivation		
Strength	28	63.6
Weak	16	36.4
Total	44	100

Table 2 Distribution of Nurses' Education towards Nursing Documentation in Installation Intensive Care General Hospital of Palembang BARI on April 2016

Education	Nursing documentation				Total	%
	Good		Not Good			
	N	%	N	%		
High (bachelor)	13	29.5	1	4.1	14	31.8
Low (diploma)	18	40.9	12	27.3	30	68.2
Total	31	70.5	13	29.5	44	100
p-value = 0.035 OR = 8.667						

Table 3 Distribution of Nurses' Motivation towards Nursing Documentation in Installation Intensive Care General Hospital of Palembang BARI on April 2016

Motivation	Nursing documentation				Total	%
	Good		Not Good			
	N	%	N	%		
Strength	23	52.3	5	11.4	28	63.6
Weak	8	18.2	8	18.2	16	36.4
Total	31	70.5	13	29.5	44	100
p-value = 0.040 OR = 4.6						

Table 2 shows that respondents with higher education (bachelor) undertook good nursing documentation with as many as 13 respondents (92.9%) out of 14 respondents, higher if compared with respondents with lower education (diploma), which served in documentation of nursing with as many as 18 respondents (60%) from 30 respondents. Chi–Square analysis obtained p – value 0.035 < α (0.05) which means there was correlation between nurses' education towards nursing documentation. Odds Ratio (OR) = 8.667, which means chance of nursing with high education is 8.677 times better in documentation of nursing than nurses with low education.

Table 3 shows that respondents with strong motivation during nursing documentation with good category were 23 respondents (82.1%). Chi – Square analysis obtained p – value 0.040 < α (0.05), which means there was correlation between nurses' motivation towards nursing documentation. Odds Ratio (OR) = 4.600, which means nurses strong motivation was 4.600 times better in nursing documentation than nurses with weak motivation.

DISCUSSION

The independent, complex role of a school nurse requires accurate documentation of assessments, interventions and outcomes. Consistent documentation by all school nurses is crucial to study the impact of nursing interventions on student's health and success in school. While standardized nursing languages are available, the actual use of these languages by school nurses is in the infancy stages of implementation. This national survey of school nurses reveals diverse practices in school nursing documentation. The result of study conducted by Kay and Yearous (2011) shows the implementation of Nursing Language (Nanda, NOC, NIC) will allow school nurses to document more consistently, base practice decisions on evidence, and improve the health and academic success of students in schools. It means that, starting from school, nurses must have optimal education of nursing documentation.

Nursing documentation is an important part of clinical documentation. A thorough nursing documentation is a precondition for good patient care and for efficient communication and cooperation within the healthcare professional team (Ammenwerth, et al., 2001). Nursing documentation is an indicator of the performance of nursing while performing nursing care that can be seen from the implementation of nursing documentation. Without nursing documentation, all of the nursing implementation done by nurses has no meaning in terms of responsibility and accountability (Dellefield, 2006). Nursing documentation is one of the efforts required to establish and maintain accountability of nurses and nursing (*Webster New World Dictionary* cited in Marelli, 2007).

Nursing staff working in long-term institutional care attend to residents with an increasing number of severe physical and cognitive limitations. To exchange information about the health status of these residents, accurate nursing documentation is important to ensure the safety of residents (Saranto and Kinnunen, 2009). The implementation of nursing documentation a measure in determining, monitoring and concluding nursing care service organized by the hospital (Fischbach, 1991 in Setiadi, 2012). Education is greatly influenced the implementation of nursing documentation. Nurses with different levels of education will have different quality of documentation, because the higher the level of education, the cognitive abilities and skills will increase as well (Notoatmodjo, 2003).

Wawan and Dewi (2010) stated that the higher a person's education, the more easily to receive information, so that they can make a decision to do the documentation. Whereas Siagian (2010) states

that higher education would increase the motivation, desire and intellectual maturity in the application of the complete documentation. Gibson and Ivancevich (1995) state that higher education levels generally lead to someone being more able and willing to accept responsibility. This will affect the completeness of the nursing documentation.

Nursing services are highly dependent on the performance of nurses, which is strongly influenced by the performance of nurse's motivation (Broderic and Coffey 2013). This is in accordance with the opinion of Davis (1997) cited in Abdullah, 2012) who said that the factors that may affect the achievement of the nurses' performance in nursing documentation include capability and motivation.

Nursing documentation requires nurses motivation that comes from the heart, to create nurses' strong motivation, and the need to be aware of the need and importance of nursing documentation (Swanburg, 2000). Proper motivation will encourage the employees to do as much as possible in carrying out their duties because they believe that the success of the organization in achieving the goals and targets of various personal interests of members will be fulfilled also (Siagian, 2010). Ilyas (2001) said that if someone is motivated and concerned they will strive to improve achievement.

The result of this study showed that there was significant correlation between nurses' education towards nursing documentation in Installation Intensive Care General Hospital of Palembang BARI 2016. The result of a study conducted by Pratiwi et al. (2013) regarding the correlation of education levels and long period of works towards the completeness of nursing documentation in General Hospital of Tugumulyo, Tugurejo, Semarang, showed that there was significant correlation between education levels towards the completeness of nursing documentation.

Researchers assumed that the education level of nurses had an important role in quality of nursing documentation as a good or not good indicator of nursing service in hospitals that will improve the quality of the hospital so that appropriate care quality standards will be achieved. The result is that a higher level of a nurse's education will improve the quality of nursing documentation in the nurse's work areas. This is because the level of education will affect the cognitive ability and intellectual maturity and motivation of the nurses (Voyer et al., 2014).

The current study conducted by Tuinman et al. (2017) found inaccuracies in the content and coherence of nursing documentation in long-term institutional care. This may complicate communication between health professionals, data extraction by managers for quality and reimbursement purposes and also jeopardize residents' safety and wellbeing. Taking into account the increasing acuity levels of residents, managers should reconsider whether the available nursing staff and resources are sufficient to provide for accurate nursing documentation. Investments in resources (e.g., time, structured (electronic) careplans) may be required to facilitate accurate documentation. Furthermore, the reasoning skills of nursing staff should be investigated and trained, tailored to their educational background and scope of practice, to ensure that they competently perform their careplanning job responsibilities. Implementation of professional standards in accordance with legal requirements and regular audits may further enhance the quality of nursing documentation.

The result of the study conducted by the researcher showed that there was correlation between nurses' motivation towards nursing documentation in Installation Intensive Care General Hospital of Palembang BARI 2016. The study conducted by Pakudek et al. (2014) about the correlation of nurses' motivation towards nursing documentation in Installation Inpatient C of RSUP Prof. Dr. Kandou Manado, showed that there was significant correlation between nurses' motivation towards nursing documentation. The researcher assumed that the level of nurses' motivation had an important role in quality of nursing documentation, as good or not good indicators of a nurse's service in the hospital, which will improve the quality of the hospital so that appropriate care quality standards will be achieved.

In our opinion, a high acceptance of the nursing process, a careful preparation of predefined care plans (at least partly based on standardized vocabulary), together with elementary measures, such as organizational preparation, good project management, inclusion of future users in the preparation process, and sufficient technical equipment with integration into the hospital information system, are important preconditions for the success of nursing process documentation (Ammenwerth et al., 2001). This confirms the results of other studies. In addition, the nursing terminology and the nursing care plans must be regularly maintained and updated, taking into account the development of skills and experiences of the users (Wang et al., 2011).

As a result, the higher level of a nurse's education will improve the quality of nursing documentation in the nurse's work areas. This is because the level of a nurse's motivation will influence their performance and the motivation to give the nurses a direction of interest in doing their job.

CONCLUSION

Education and motivation of nurses have significant relationship to the nursing documentation in Hospital Intensive Care Unit. This was due to the high level of education and a strong motivation level which will provide quality nursing care.

The hospital management is expected to provide opportunities and encourage hospital human

resources, especially for nurses to be able follow appropriate education hierarchically. This is in accordance with the demands of legislation governing nursing education, and it should hold trainings on documentation. Future research is expected to add methodology, sample, variables and other factors related to the nursing documentation in the Installation Intensive Care.

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Original Research

Effects of Health Education on Leptospirosis Prevention through *Dasawisma*

Sri Mulyanti and Athanasia Budi Astuti

Department of Nursing, Poltekkes Kemenkes Surakarta, Central Java, Indonesia

ABSTRACT

Introduction: Globally, leptospirosis is still a major health problem in African and developing countries, including Indonesia. The best control effort is with prevention through health education. Health education with conventional methods is considered less effective, so there is a need to look for other health education methods.

Methods: Aims of the research are to know the difference of effectiveness of health education methods between conventional classical method and *dasawisma* or peer group in (1) improvement of knowledge of leptospirosis disease prevention; (2) effectiveness in prevention of leptospirosis. Research is Quasi-Experimental research with a two-group control trial design. The sample consisted of 40 respondents treated by health education through *dasawisma* using a leptospirosis module as a media of Health Education, and 40 control group respondents who were given education using conventional method. Sampling technique used purposive sampling. Data were statistically analyzed with Independent T-Test.

Results: (1) Meaning of treatment group = 21.77 higher than control group = 19.62 (2) Mean prevention effort of leptospirosis disease treatment group = 54.35 better than control group = 48.15 (3) Health education through *dasawisma* was effective to increase knowledge prevention of leptospirosis (t = 2.943; p = 0.004) (4) Health education through *dasawisma* was effective for increasing prevention effort of leptospirosis (t=4.695; p=0.001).

Conclusion: Health education through *dasawisma* and leptospirosis module is significantly effective to improve knowledge of leptospirosis disease and in prevention efforts of leptospirosis.

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dasawisma; health education; leptospirosis; module of leptospirosis

CONTACT

Sri Mulyanti
✉ di_yanti96@yahoo.com
Department of Nursing, Poltekkes Kemenkes Surakarta, Central Java, Indonesia

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INTRODUCTION

Globally, tropical infectious diseases are still a very worrying health problem, especially in African countries and other developing countries, including Indonesia. Leptospirosis is a zoonotic disease caused by infection of bacterial microorganisms of *Leptospira introgans* irrespective of its specific serotype form. The incidence of leptospirosis in Indonesia is still high. According to the International Leptospirosis Society (ILS), Indonesia is a country with leptospirosis incidence ranked third below China and India. In leptospirosis patients with yellow eye lining (damage to liver tissue), the risk of death will be higher. In some publications, the mortality rate is reported to be between 3% - 54% depending on the system of the infected organs (Depkes, 2012).

According to the World Health Organization (WHO), in developing countries, especially those with hot or tropical climates, the incidence of leptospirosis is more than 1000 times compared with subtropics countries with a greater risk of illness. The incidence rate of leptospirosis in tropical countries is estimated to reach 5-20/100,000 population per year. Leptospirosis is spread throughout the world. For example, the highest ever reported epidemiological study was the incidence rate of leptospirosis in New Zealand between 1990 and 1998 of 44 per 100.000 population. The highest incidence rates occurred in meat-related workers (163/100,000 inhabitants), farmers (91.7/100,000 inhabitants) and forest-related workers by 24.1 per 100,000 population (WHO, 2010).

Based on reports from the Central Java Provincial Health Office in 2011 the number of cases of

leptospirosis in 155 residents caused the death of 23 people. This number increased compared to the year 2010, which was 133 victims of leptospira bacteria, 14 of whom died (Dinas Kesehatan Propinsi Jawa Tengah, 2011). One of the areas in Central Java Province that often occurs cases of leptospirosis is in the area of the Boyolali regency. Based on data from Boyolali District Health Office obtained information shows that the positive diagnosis of leptospirosis incidence first occurred in 2012 with the incidence of two cases found in the work area of the Ngemplak Boyolali health center. Then, in 2013, incidence of six cases was found. And in 2014, this increased to 17 cases of whom seven died (Case Fatality Rate 43.75%) (Dinas Kesehatan Kabupaten Boyolali, 2014). Ngemplak health center officers have also undertaken health education several times in *Posyandu*, but the results from year to year regarding the incidence of leptospirosis shows a continued increase. This is in contrast to existing research, which shows that health education affects leptospirosis prevention efforts. The results of Kusumastuti's research (2011) showed health education had an effective influence on leptospirosis prevention efforts. The results of research also providing evidence of the influence of health education on leptospirosis prevention efforts come from Nurjanah, Sugiyanto and Kun (2013) on the Relationship between Public Knowledge about Leptospirosis Prevention and Behavior of Health Officers. *Puskesmas* Kedungmundu's Practice of Leptospirosis Prevention in Kelurahan Tandang Kota Semarang also provides evidence there is a relationship between knowledge and leptospirosis prevention efforts. During this period, general health education is generally done when there is *Posyandu* activity and it has not been tried through a *dasawisma* or small peer group families by using the module. *Dasawisma* is a small family group of 8-10 families.

MATERIALS AND METHODS

This research used quasi-experimental with two group control trial design. The sample consisted of 40 respondents treated by health education through *dasawisma* using the module and 40 control group respondents using conventional method. *Dasawisma* is a small family group of 8-10 families. The Leptopsirosis module is a small book that is distributed to respondents to read and take home. The leptospirosis module contains the concept of leptospirosis and simple precautions to be easily understood by the audience. Data were collected by a leptospirosis cognitive test and questionnaire on leptospirosis incidence. Knowledge is measured by cognitive tests with 30 questions divided into two categories (good and less). Leptospirosis prevention measures were measured using a questionnaire with a number of Guttman scale statements (always, occasionally, never). Instrument validity test used Pearson correlation with SPSS 18. Sampling technique used purposive sampling. Data were analyzed with Independent t-test. Ethical clearance was received from the ethical committee at the health polytechnic of Surakarta (number ECPKS/X/002/2017 on 20 February, 2017.

RESULTS

The characteristics of respondents are shown in Table 1. Demographically, based on the age category in the treatment group, the majority are in the 31 to 40 years category by as much as 32.5%, while, in the control group, most are in the age group of 20 – 30, accounting for 37.5%. Characteristics of religion followed by the majority of respondents is Islam with 95% in the treatment group and 97.5% in control group. Regarding education, it is generally seen equal wherein most treatment groups have high school education of 40% and, in the control group, as many as 47.5%.

Table 2 illustrates both the treatment group and the control group in which no one had ever been suspected of leptospirosis disease. However, the risk of contracting the disease is quite large, namely the presence of rat vectors in the treatment group by as much as 75% and in the control group 72.5%. Besides, there is also the environmental factor, which is the water channel around the house in the control group, with 92.5% while, in the treatment group it is 87.5%. Related to whether the daily respondents were often exposed or had contact with sewer water or sewerage channels, both groups showed the same result, 22.5%.

Table 3 shows the level of knowledge of respondents before health counseling about leptospirosis in the treatment group with the highest percentage in the less category of 82.5%, while, in the control group, the majority was also in the less category with 90%. The result of univariate analysis was obtained in the treatment group with an average value of 18.6, minimum 11, maximum 25, with deviation standard 3.57. While, in the control group, the average value was of 17.6 maximum 26, minimum 7 and standard deviation 4.38.

While the description of the level of knowledge of respondents after health education, as shown in Table 4, shows that the level of knowledge of the respondents in the treatment group is the highest in the category less, by 55%, and the good category is 45%. However, in the control group, the percentage of knowledge level in the category of less is more 77.5% and in the good category 22.5%. The result of univariate analysis showed, in the treatment group, average value of 21.77, maximum value 27, minimum value 16 and standard deviation 2.67, while the control group obtained average value of 19.62, with maximum value 27 and minimum value 12 with a standard deviation value of 3.7.

Independent t test obtained that health education through dasawisma had significant effect on knowledge level of the respondents (t value = 2.943 with p = 0.004). The mean value of treatment group

Table 1. Demographic Characteristics

Variables	Treatment (n = 40)		Controls (n = 40)	
	f	%	f	%
Age				
20 - 30	12	30	15	37.5
31 - 40	13	32.5	11	27.5
41 - 50	11	27.5	9	22,5
>50	4	10	5	12.5
Religion				
Islam	38	95	39	97.5
Christian	1	2.5	1	2.5
Catholic	1	2.5	0	0
Education				
Elementary	7	17.5	10	25
Junior High School	12	30	12	30
Senior High School	16	40	17	47.5
Diploma	2	5	0	0
Bachelor	3	7.5	1	2.5

Table 2. Characteristics of Respondents Based on Leptospirosis Risk Factors

Variables	Treatment		Control	
	f	%	f	%
Have experience of sick				
Yes	0	0	0	0
No	40	100	40	100
Environment				
Rat	30	75	29	72.5
Ditch	35	87.5	37	92.5
Contact	9	22.5	9	22.5

Table 3. Description of Knowledge Level of Respondents about Leptospirosis before Being Given Health Education

Categories	Treatment		Control	
	f	%	f	%
Less	33	82.5	36	90
Good	7	17.5	4	10

(21.77) is higher than the control group (19.62), so it means that health education through dasawisma using the module is more effective in improving leptospirosis knowledge compared with the conventional method.

Leptospirosis Prevention Effort

Prevention efforts for leptospirosis infection were measured twice (pre-test and post-test). Pre-test to determine the prevention efforts of respondents before being given health education, while post-test was to know the value of respondent knowledge level after being given health education by using the module in the *dasawisma* group.

Table 6 shows the prevention of leptospirosis before health counseling; in both the treatment group and the control group, the number in the good category is more than the less category. Univariate

Table 4. Description of Knowledge Level of Respondents about Leptospirosis Having Been Given Health Education

Categories	Treatment		Control	
	f	%	f	%
Less	22	55	31	77.5
Good	18	45	9	22.5

Table 5. Effect of Health Education on Knowledge Level of Respondents about Leptospirosis

Group	Treatment	Control
Mean	21.77	19.62
Std	2.67	3.76
t	2.943	
Sig (2-tailed) p	0.004	

Table 6. Description of Leptospirosis Prevention Efforts before Being Given Health Education

Categories	Treatment n = 40		Control n = 40	
	f	%	f	%
Less	9	22.5	8	20
Good	31	77.5	32	80

Table 7. Description of Leptospirosis Prevention Efforts Having Been Given Health Education

Categories	Treatment n = 40		Control n = 40	
	f	%	f	%
Less	1	2.5	12	30
Good	39	97.5	28	70

Table 8. Effect of Health Education on Prevention of Leptospirosis

Group	Treatment	Control
Mean	54.35	48.15
Std	4.54	7.00
t	4.695	
Sig (2-tailed) p	0.001	

analysis results obtained data on the treatment group which showed the mean of 51.42, maximum value 60.00, minimum value 39 and standard deviation of 7.07. While, in the control group, there was average value of 48.00, maximum value 58, and minimum value 22 with standard deviation of 7.69.

The value of prevention of leptospirosis after health education as shown in Table 7 shows the value in the treatment group is much better than the control group, that is for the category of either 97.5% versus 70%, while in the category less 2.5% is much less than control group that reached 30%. Univariate analysis result showed the increase of value in both treatment and control group that is in the mean treatment group 54.35 maximum value 64 and minimum value 41 with standard deviation 4.59. As for the control group shows the average value of 48.18 maximum value 58 minimum value 28 and value standard deviation 7.00.

Table 8 shows that health education through *Dasawisma* and leptospirosis module is effective for increasing prevention of leptospirosis disease as

shown by t = 4.695 (p = 0.001) and median value of treatment group 54.35 is much better than control group (48.15).

DISCUSSION

Effectiveness of Health Education through *Dasawisma* and Leptospirosis Module Regarding Knowledge

Leptospirosis is a disease caused by pathogenic leptospires. Symptoms of leptospirosis are similar to other infectious diseases, such as influenza, meningitis, hepatitis, dengue fever, dengue hemorrhagic fever and other viral fevers (Sudoyo, 2006). Leptospirosis usually occurs endemically in densely populated areas. However, it can also occur in rural areas where the distance between houses is far away, but sanitation of water disposal is not hygienic, so it is easy to become a medium for leprosy vector transmission of leptospirosis. According to Lehman (2014), the pathogenesis of leptospirosis has not been fully understood. The leptospires enter the body of the host through iris / abrasion lesions on the skin, conjunctiva or intact mucosa that lines the mouth, pharynx, esophagus, bronchus or alveolus and can enter by inhalation droplet infection and by drinking contaminated water.

To be able to perform the prevention and control of endemic leptospirosis disease requires public awareness to always maintain a lively environment so as not to become a medium for rat breeding as a means of transmission of leptospirosis disease or through other creatures such as goats, cattle, sheep and others. Awareness will form naturally after the individual knows or knows about an object that is around it, including leptospirosis disease. Promotional action is the most inexpensive and safe strategy to control a disease. Health promotion can be done through health education or health counseling. Through health counseling, health workers can provide information to individuals, families, or communities so that knowledge will increase. Knowledge is the result of knowing, and this happens after people have sensed a particular object. Knowledge or cognition is a very important domain in shaping one's actions (over behavior). Behavior based on knowledge will be better than behavior that is not based on knowledge (Notoatmodjo, 2011). According to Azwar (as cited in Fitriani, 2011), educational activities or health education is a health promotion method that is done by spreading the message, instilling confidence so that people are not only aware, know and understand, but are also willing and able to see that there is a relationship with health.

The results of Okatini, Purwana and Djaja's (2007) studies provide similar evidence with this study wherein the dominant factors affecting leptospirosis occurrence are education (OR = 3.7), knowledge (OR = 33.1), clean water (OR = 4.5), and component home structuring (OR = 8.2). The results of this study are also similar to Priyanto's (2008) research where community behavior has an influence on the incidence of leptospirosis. Thus, leptospirosis prevention efforts should be pursued by changing the behavior of the community through health education activities. The success of health education is influenced by several factors, one of which is the size of audience or the target of counseling. According to Fitriani (2011), the smaller the target or the audience then the easier is the management of the extension process. According to Harsono's (2004) model of learning with small groups, where the audience is divided into small groups consisting of 8-10 learners, this will be more effective in achieving learning objectives. In application, this small group can be realized in the form of homelessness. Each *dasawisma* group consists of about 10-20 members. The results of this study provide empirical evidence that health education methods of leptospirosis disease through *dasawisma* are more effective than classical methods. Table 5 shows the value t = 2.943 with p = 0.004, so it can be concluded that H0 rejected and Ha accepted, which means there is difference between the treatment group and the control group. Because the mean value of the treatment group, 21.77, is higher than the control group value of 19.62, it can be concluded that health education through *dasawisma* using the module is more effective in improving leptospirosis knowledge compared with the conventional method, which is by lecturing through a large group or class. With the small group method of *dasawisma*, a counselor or tutor will be easier to control the class or audience.

The *dasawisma* of this study consists of 10 members who are mostly mothers or women, who, in fact, have a better effect of nature in terms of increasing knowledge and public participation in prevention of leptospirosis disease. The interaction between counselor and audience is also closer and more intense, so that the counseling process will be more interactive and the material will be more easily remembered and understood by the audience. In counseling or learning, using small groups of media are good modules. In the module, it has been arranged so that the written material is concise, clear and applicable. In the module, there are also problems of training so that with a relatively small number of audience then the material will be more easily remembered. The results of this study are in line with research by Rahmawati (2012) which proves that the number of mice as a vector of leptospirosis transmission is increasingly in line with the participation of mothers in installing a mousetrap. Health education through *dasawisma* will be more effective, because *dasawisma* is a vehicle for community participation in the field of health by self-help at family level, directly controlled by the PKK village team. One of the family members in the tenth group is chosen to be the group leader or liaison with the coach or counselor.

Effect of Module on *Dasawisma* on Prevention of Leptospirosis Disease

Individual behavior can be distinguished from the level of knowledge which then shapes attitudes. Attitude is a reaction or a person's response to a stimulus or object. Manifestations of attitudes cannot be directly seen, but are only interpreted first from closed behaviors. From this understanding, it can be underlined that, as long as the behavior is still closed, then it is called attitude, whereas, when it is open, the actual behavior is shown as health (Adnani, 2011). According to Fitriani (2011), the factors that influence the formation of behavior include knowledge, perception and attitudes of a person to a health problem. This study provides empirical evidence that health education through *dasawisma* can change or increase public awareness and efforts in prevention and control of leptospirosis disease. Table 7 shows that health education through homelessness and the leptospirosis module is effective to increase prevention of leptospirosis disease as indicated by t value 4.695 (p = 0.001) and median value of treatment group 54.35, which is much better than the control group of only 48.15. According to Lehman (2014), prevention and control of leptospirosis can be done by providing intervention on the source of infection and intervention in the path of transmission and human host. Such actions can be carried out by, for example, reducing rat populations in several ways, such as rat poison, trapping, rodenticide use and rodent predators, eliminating rats' access to settlements, food and drinking water by building agricultural warehouses as sources of water reservoirs and moor-resistant yards, and by throwing away food and trash far from the reach of rats. Preventing rodents and other wildlife from living in human habitats by maintaining a clean environment, removing trash from grass and shrubs, and maintaining sanitation, especially by building good sewage and bathroom facilities and providing clean drinking water. These actions can be done well, if the community has sufficient knowledge and perception of how to prevent leptospirosis disease. The results of this study are in line with the research of Murti, Prabandari and Riyanto (2006) in which the peer education method through homelessness was effective in the discovery of Lung Tuberculosis. Although the goal of peer education was the discovery of suspected TBC Lung, in principle it provides evidence that peer education methods through small groups are effective for improving public health efforts.

CONCLUSION

Health education with *dasawisma* is effective to increase knowledge about prevention of leptospirosis, hence increasing prevention of leptospirosis. Based on the conclusions of this research, nurses are expected to use the *dasawisma* medium in an effort to improve the levying and prevention efforts of leptospirosis disease and they should be able to use and develop the leptospirosis module as a medium of education and health promotion on prevention efforts of leptospirosis disease.

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Original Research

The Influence of Peer Health Education Toward the Decreasing Risk of Heart Disease

Riza Fikriana[1] and Al Afik[2]

[1] Sekolah Tinggi Ilmu Kesehatan Kepanjen Malang, Jawa Timur, Indonesia
[2] Universitas Muhammadiyah Yogyakarta, D.I. Yogyakarta, Indonesia

ABSTRACT

Introduction: Heart disease is the number one cause of death in Indonesia. Promotional efforts through the provision of health education and counselling through Peer Health Education is one of the primary prevention strategies that can be undertaken to prevent the occurrence of heart disease. The purpose of this study is to prove the influence of Peer Health Education in reducing the risk of heart disease.

Methods: The research method used in this study was quasi-experimental with a pre-test-post-test non-equivalent control group design. The samples were taken from 56 people using the purposive sampling technique. The first group of 28 people was the experimental group and the second group of 28 people was the control group. Before and after treatment, both groups were measured concerning their knowledge, lifestyle behaviour, blood pressure, blood glucose levels, blood cholesterol levels and risk assessment of heart disease. Data analysis was done by using the Friedman Test with a 95% significance level.

Results: The results showed that Peer Health Education was able to improve the respondents' knowledge about having a healthy lifestyle, changing the behaviour of the respondents, i.e. behaviour of consuming sweet foods, controlling blood pressure and decreasing the risk of heart disease.

Conclusion: Based on the result, health promotion efforts through a Peer Health Educator can continue to be done as one method to improve heart health in the community. Thus, the expectation of morbidity and mortality due to heart disease can be lowered.

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CONTACT

Riza Fikriana
✉riza_fikriana@stikeskepanjen-pemkabmalang.ac.id
Sekolah Tinggi Ilmu Kesehatan Kepanjen Malang, Jawa Timur, Indonesia

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INTRODUCTION

Heart disease is the number one cause of death in Indonesia and around the world. Based on valid data, each year approximately 17.3 million people die from a heart attack. It is estimated that by 2030, deaths from heart disease will reach 23.6 million inhabitants (Mozaffarian et al, 2015). Based on the basic health research data conducted by the Ministry of Health of the Republic of Indonesia in 2013, it is known that the prevalence of coronary heart disease in Indonesia in 2013, based on doctor/symptom diagnosis, is 1.5% of the total population or about 2,650,340 people. In this data, it is known that most patients come from the East Java Province with a total of 375,127 people. In addition, based on the doctor's diagnosis, East Java Province is also the region with the highest number of heart failure patients in Indonesia (Center for Data and Information Ministry of Health, Indonesian Republic, 2014).

Heart disease is a disease caused by a disorder of the heart or the blood vessels. Several risk factors such as age, gender, family history, and obesity, lack of exercise/lack of exercise, unhealthy diet, stress, hypertension, dyslipidemia and diabetes mellitus can lead to heart disease (Bickley, 2015). Quick and proper treatment is needed for patients in order to prevent the occurrence of morbidity and mortality of patients who have had a heart attack or are at risk of it.

Several attempts can be made to prevent the risk of heart attack. The American Heart Association recommends seven important keys to maintaining heart health, such as by quitting smoking, maintaining

a level of physical activity with regular exercise, maintaining a healthy diet, maintaining normal weight and controlling blood pressure, cholesterol and blood sugar levels in the body (Mozaffarian et al, 2015). The World Health Organisation (WHO) in 2011 developed a framework of reference that can be used to prevent and control the occurrence of heart disease by making efforts to increase public awareness about the importance of heart health, through increased health promotion activities. In terms of reference, it is explained that the age group most at risk for heart disease is 30-70 years old. In this age range, it is very important to maintain heart health through healthy lifestyle behaviours (Chestnov, 2011). Health promotion through education and counselling activities is one of the efforts used to guide someone to undertake the necessary lifestyle changes to maintain heart health (Bickley, 2015).

To assist in the provision of health information, there are a variety of methods available. Peer Health Education is one of the strategies that can be used to provide health education to people with certain characteristics. This activity is carried out by Peer Health Educators, people with the same characteristics as the community groups, considered to have the ability to influence these groups so that efforts to improve knowledge, skills and behavioural changes are easier to produce. From previous research study results, Peer Health Education can effectively be used to improve knowledge, skills and the ability to change one's own health behaviour (Duncanson et al, 2014). In addition, peer education is able to improve attitude (Khosravi et al, 2017; Gurkan & Komurcu, 2017), increase confidence in goal setting ability (Gough & Cassidy, 2017), and reduce anxiety (Homan & Chichester, 2016).

Based on the above background, the current researchers are interested in conducting a study on the influence of Peer Health Education in relation to the modification of lifestyle against the risk of heart disease in a community at risk. The purpose of this study is to prove the effectiveness of Peer Health Education in relation to the modification of lifestyle and the risk of heart disease in the community.

MATERIALS AND METHODS

This study used a quasi-experimental with a pre-test-post-test non-equivalent control group design. Research data retrieval activities were conducted in Kepanjen, Kepanjen District, Malang, in June - August 2017. The samples were taken by using the purposive sampling technique. There were 56 people divided into two groups, as the treatment group and control group respectively. The research instruments include questionnaires to measure knowledge, a checklist of healthy lifestyle behaviours, a checklist of the risk of cardiovascular heart disease - the "Jakarta Cardiovascular Score", a sphygmomanometer, blood cholesterol test and blood glucose test.

The data collection process began with pre-test activity by asking the respondents to fill out a questionnaire about their knowledge and healthy lifestyle behaviours, to fill out a checklist of the risk factors for heart disease, and to measure their blood pressure, blood cholesterol and blood glucose. Furthermore, the treatment group was given Peer Health Education by Peer Health Educators, as determined by the researchers. Two weeks after the advent of Peer Health Education, the researchers employed a second re-measurement of knowledge, healthy lifestyle behaviours, the calculation of the risk of heart disease, and blood pressure, blood glucose and blood cholesterol. Two weeks later, a third re-measurement was employed. The questionnaire used in this study had been validity tested using a Product Momen Pearson Correlation and reliability test. The instrument's Cronbach's alpha was 0.852. The three measurements were performed in both the treatment and control group. The data was then analysed using univariate and bivariate tests. In the univariate test, the data was analysed and presented in terms of percentage, mean, standard deviation, median, and minimum and maximum according to the data type. In the bivariate test, the data was analysed using the Wilcoxon, Mann-Whitney or Friedman test according to the type of data distribution related to each variable with a 95% significance level. This research study received ethical clearance approval from the Health Research Commission of Health Polytechnic, of the Health Ministry of Malang (No.002/KEPK-POLKESMA/2017).

RESULTS

The research was conducted on 56 respondents divided into two groups. The first group was a control group of 28 respondents with an average age of 42.86 years. The second group of 28 respondents had an average age of 43.61 years. Both groups are all female.

Knowledge of a Healthy Lifestyle to Prevent Heart disease

Knowledge of a healthy lifestyle to prevent heart disease in each group has been listed in Table 1. In Table 1, it was found that in the experimental group, there was a significant difference in the respondent's knowledge between before and after, following the peer health education with a p-value equal to 0.004. In the control group, it was found that there was no knowledge difference between the first measurement and the measured knowledge two weeks after the first measurement with a p- value of 0.172. This is in accordance with the results of the study listed in Table 2, which explains that there is a significant difference in the knowledge of a healthy lifestyle to prevent heart disease in the experimental group and the control group with a p-value of 0.034. Based results, it can be concluded that peer health education can increase one's knowledge about living a healthy lifestyle in order to prevent heart disease.

Table 1. Results of the Wilcoxon test analysis of the knowledge of what is a healthy lifestyle before and after treatment in the experimental and control groups.

	Knowledge	Median (Minimum-maximum)	p-value
Experimental Group	Before treatment	7 (6 – 10)	0.004
	Two weeks after the treatment	8 (6 – 10)	
Control Group	First test	7 (4 – 10)	0.172
	Two Weeks after the first test	7 (4 – 10)	

Table 2. Mann Whitney test analysis results: differences in healthy life pattern knowledge between the experimental and control groups.

Knowledge	Median (Minimum-Maximum)	p-value
Knowledge of Experimental Group	8 (6 – 10)	0.034
Knowledge of Control Group	7 (4 – 10)	

Table 3. Behaviour of the modification of the experimental-group's lifestyle

No	The behaviour of lifestyle modification	Pre n (%)	Post-1 n (%)	Post-2 n (%)	p-value[a]
A	Consumption patterns of fatty foods				
	>1 time/day	8 (28.6)	6 (21.4)	4 (14.3)	0.229
	1-6 times/week	16 (57.1)	18 (64.3)	21 (75)	
	<3 times/month	4 (14.3)	4 (14.3)	3 (10.7)	
B	Consumption patterns of sweet foods				
	>1 time/day	11 (39.3)	12 (42.9)	3 (10.7)	0.011
	1-6 times/week	14 (50)	13 (46.4)	20 (71.4)	
	<3 times/month	3 (10.7)	3 (10.7)	5 (17.9)	
C	Physical activities				
	Active	6 (21.4)	3 (10.7)	4 (14.3)	0.368
	Less Active	22 (78.6)	25 (89.3)	24 (85.7)	
D	Stress/anxiety				
	Every day	2 (7.1)	1 (3.6)	7 (25)	0.308
	Often	2 (7.1)	4 (14.3)	2 (7.1)	
	Occasional	23 (82.1)	22 (78.6)	18 (64.3)	
	Never	1 (3.6)	1 (3.6)	7 (25)	
E	Smoking Habit				
	Every day	0 (0)	0 (0)	0 (0)	1.000
	Occasional	0 (0)	0 (0)	0 (0)	
	Ex-Smoker	0 (0)	0 (0)	0 (0)	
	Non-Smoker	28 (100)	28 (100)	28 (100)	
F	Alcohol consumption				
	Every day	0 (0)	0 (0)	0 (0)	1.000
	Occasional	0 (0)	0 (0)	0 (0)	
	Ex-consumer	0 (0)	0 (0)	0 (0)	
	Never Consume	28 (100)	28 (100)	28 (100)	

Note: [a] Result of the Friedman Analysis

Healthy Lifestyle

The behaviour of the modification of one's lifestyle to prevent the occurrence of heart disease was measured based on the respondent's behaviour regarding the consumption pattern of fatty foods and sweet foods, participation in activities/sports, stress/anxiety, smoking and alcohol consumption. The description of the respondent's behaviour in the experimental
group and control groups has been listed in Tables 3 and 4 respectively. Based on Table 3, it can be explained that only the pattern of consumption of sweet foods that has a p-value <0.05 can be interpreted to indicate that there is a significant difference in the consumption patterns of the respondents between the first, second and third measurements. The consumption behaviour of fatty foods, physical activity and stress/anxiety show no significantly different results between the first, second and third measurements. In relation to the measurement of smoking habits and alcohol consumption, it has a fixed value between the first, second and third measurements.

Table 4 shows that in the control group, there was no significant difference in the healthy lifestyle behaviour and all of the associated components (consumption of fatty foods, consumption of sweet foods, physical activity, stress/anxiety, smoking habits, and alcohol consumption habits) between the first, second and third measurement.

Table 5 shows that there were differences in the behaviour of the healthy lifestyle undertaken to prevent heart disease between the experimental group and the control group. The difference is in the pattern of consumption of fatty foods with a p-value of 0.041. The pattern of consumption of sweet foods, physical activity, stress/anxiety, smoking habits and alcohol consumption habits did not show any

Table 4. Behaviour of modification of the control group's lifestyle patterns

No	The behaviour of Lifestyle Modification	Pre n (%)	Post-1 n (%)	Post-2 n (%)	p-value[a]
A	Consumption patterns of fatty foods				
	› 1 time/day	13 (46.4)	5 (17.9)	9 (32.1)	0.078
	1-6 times/week	11 (39.3)	20 (71.4)	19 (67.9)	
	‹ 3 times/month	4 (14.3)	3 (10.7)	0 (0)	
B	Consumption patterns of sweet foods				
	› 1 time/day	14 (50)	7 (25)	5 (17.9)	0.084
	1-6 times/week	12 (42.9)	20 (71.4)	22 (78.6)	
	‹ 3 times/month	2 (7.1)	1 (3.6)	1 (3.6)	
C	Physical activities				
	Active	6 (21.4)	6 (21.4)	2 (7.1)	0.264
	Less Active	22 (78.6)	22 (78.6)	26 (92.9)	
D	Stress/anxiety				
	Every day	0 (0)	0 (0)	0 (0)	0.441
	Often	4 (14.3)	1 (3.6)	1 (3.6)	
	Occasional	20 (71.4)	23 (82.1)	26 (92.9)	
	Never	4 (14.3)	4 (14.3)	1 (3.6)	
E	Smoking Habit				
	Every day	0 (0)	0 (0)	0 (0)	1.000
	Occasional	0 (0)	0 (0)	0 (0)	
	Ex-Smoker	0 (0)	0 (0)	0 (0)	
	Non-Smoker	28 (100)	28 (100)	28 (100)	
F	Alcohol consumption				
	Every day	0 (0)	0 (0)	0 (0)	1.000
	Occasional	0 (0)	0 (0)	0 (0)	
	Ex-consumer	0 (0)	0 (0)	0 (0)	
	Never Consume	28 (100)	28 (100)	28 (100)	

Note: [a] Result of the Friedman Analysis

Table 5. Mann Whitney test analysis results - differences in the healthy lifestyle behaviour between the experimental and control groups

Lifestyle Pattern		p-value
Consumption patterns of fatty foods	Experimental Group Control Group	0.041
Consumption patterns of sweet foods	Experimental Group Control Group	0.114
Physical activities	Experimental Group Control Group	0.392
Stress/anxiety	Experimental Group Control Group	0.221
Smoking Habit	Experimental Group Control Group	1.000
Alcohol consumption	Experimental Group Control Group	1.000

significant differences between the experimental and control groups.

The Measurement of Blood Pressure, Blood Cholesterol and Blood Glucose

The results of the measurement of blood cholesterol, blood glucose and blood pressure levels between the experimental group and the control group have been listed in Table 6. It can be explained that the results of the blood cholesterol and blood glucose level tests in both the experimental and control groups did not differ significantly between the measurements taken pre-test, post-test-1 and post-test-2. However, in relation to the blood pressure measurements in both the treatment and control groups, there was a significant difference between the measurements of pre-test, post-test-1 and post-test-2. From the measurement of blood pressure, the p-value of the treatment group was smaller than that of the control group, so it can be concluded that the change in blood pressure in the treatment group is more meaningful.

The Risk of Heart Disease

The risk of cardiovascular disease in the experimental and control groups has been shown in Tables 7, 8 and 9. Table 7 shows a description of the risk of heart disease in the experimental and control groups. Based on the above table, it shows that at the end of the measurement period, more than half of respondents in the experimental group - equal to 53.6% -have a low risk of heart disease. the respondents who experienced a high risk decreased from 25% to 21.4%. In the control group, it showed

Table 6. Results of blood cholesterol level, blood glucose and blood pressure in the experimental and control group

Blood Cholesterol Levels	**Pre Mean (SD)**	**Post-1 Mean (SD)**	**Post-2 Mean(SD)**	**p-value**
Experimental Group	195 (48.901)	204.86 (46.865)	212.14 (36.209)	0.291[a]
Control Group	203.57 (52.907)	204.04 (63.093)	202.71 (69.967)	0.995[a]
Blood Glucose	Pre Median (Min-Max)	Post-1 Median (Min-Max)	Post-2 Median (Min-Max)	p-value
Experimental Group	106 (63-397)	102 (44-244)	102.5 (55-211)	0.503[b]
Control Group	111.5 (78-416)	109 (70-341)	105.5 (70-478)	0.756[b]
Blood Pressure	Pre n (%)	Post-1 n (%)	Post-2 n (%)	
Experimental Group				
Normal	9 (32.1)	7 (25)	13 (46.4)	0.010[c]
Pre-Hypertension	9 (32.1)	13 (46.4)	8 (28.6)	
Hypertension Stage 1	6 (21.4)	3 (10.7)	5 (17.9)	
Hypertension Stage 2	4 (14.3)	5 (17.9)	2 (7.1)	
Control Group				
Normal	10 (35.7)	14 (50)	14 (50)	0.045[c]
Pre-Hypertension	10 (35.7)	9 (32.1)	10 (35.7)	
Hypertension Stage 1	6 (21.4)	4 (14.3)	3 (10.7)	
Hypertension Stage 2	2 (7.1)	1 (3.6)	1 (3.6)	

Note: [a] Result of Repeated ANOVA Analysis,
[b, c] Result of Friedman Analysis

Table 7. Risk of heart disease in the experimental and control group

Risk of Heart Disease	**Pre n (%)**	**Post-1 n (%)**	**Post-2 n (%)**
Experimental Group			
Low Risk	15 (53.6)	16 (57.1)	15 (53.6)
Medium Risk	6 (21.4)	6 (21.4)	7 (25)
High risk	7 (25)	8 (21.4)	6 (21.4)
Control Group			
Low Risk	14 (50)	16 (57.1)	13 (46.4)
Medium Risk	8 (28.6)	7 (25)	9 (32.1)
High risk	6 (21.4)	5 (17.9)	6 (21.4)

Table 8. The result of Friedman's test analysis score of the risk of heart disease in the experimental group

Heart Disease Risk Score	**Median (Minimum-Maximum)**	**p-value**
Pre-Treatment	1 (-3 – 9)	0.060
Two Weeks after the Treatment	0.5 (-5 – 9)	
Four Weeks after the Treatment	0.5 (-5 – 9)	

Friedman test. P value on post hoc Wilcoxon: Before Treatment and Two Weeks after Treatment 0.204; Before Treatment vs. Four weeks After Treatment of 0.150; two weeks vs. Four weeks after treatment 0.679.

Table 9. The result of the Friedman test analysis score on the risk of heart disease in the control group

Heart Disease Risk Score	**Median (Minimum-Maximum)**	**p-value**
First Test (Pre)	**1,5 (-4 – 9)**	**0.098**
Two Weeks after the First Test	**1 (-6 – 9)**	
Four Weeks after the First Test	**2 (-3 – 8)**	

Friedman test. P value on post hoc Wilcoxon: Before Test vs. Two weeks After the First Test 0,516; Before Test vs. Four weeks after the First Test 0.414; Two weeks after the First Test vs Four weeks after the First Test 0.059

that at the end of the measurement period, the number amounted to 46.4% who had a low risk of heart disease. This indicates a decrease in the number of respondents with a low risk, while those at moderate risk increased between the first measurement and the third measurement from 28.8% to 32.1%.

Based on Table 8, the difference in the risk of heart disease in the first, second and third measurements in the experimental group receiving peer health education showed a p-value of 0.060, which statistically means that there is no difference in risk of heart disease before and after the respondent underwent Peer health education. However, when viewing the median and minimum values of each measurement period, positive changes from the first measurement to the last measurement indicate that the respondent tended to experience a decrease in the

risk of heart disease, from the lowest score of -3 to -5 and from the median value of 1 to 0.5.

The results listed in Table 9 focused on the difference in the risk score of heart disease in the control group in relation to the three measurements obtained a p-value of 0.098. Statistically, this shows that there is no significant difference between the first, second, and third measurements. However, when viewed from the median value achieved at the beginning of the measurement, it showed that the risk of heart disease increased from the score of 1.5 to a score of 2 at the end of the measurement period. In addition, the minimum score also increased from -4 to -3. This suggests that the control group respondents tend to have an increased risk of developing heart disease at the end of the measurement period.

DISCUSSION

The behaviour of a person living a healthy lifestyle is influenced by several factors, one of which is the knowledge and understanding possessed by a person (Mindy & Alyson, 2015). Therefore, to improve one's knowledge, it can be provided through health education. Health education activities aim to increase one's knowledge and understanding so that they will be able to transform their behaviour into a healthier one (Marianne et al, 2001). There are many methods used in health education, one of which is Peer Health Education. Peer Health Education involves a person who is considered to be able influence the community around them. By using the Peer Health Education method, it is hoped that the communities around them will find it easier to understand and implement the knowledge that they have acquired (Duncanson et al, 2014).

This is in accordance with the results of the research as shown in Table 1, which shows that Peer Health Education can increase the knowledge of the respondents on what makes a healthy lifestyle to prevent heart disease (p-value 0,004). It also showed that for the respondents who did not get Peer Health Education, their knowledge about utilising a healthy lifestyle to prevent heart disease tended to show no difference between the first measurements and the second measurement (p-value 0.172). So, from the analysis of both groups, it showed that there is a difference in the knowledge about using healthy lifestyles to prevent heart disease between the groups who underwent Peer Health Education and those who did not get Peer Health Education access (p-value 0.034). Peer Health Education is an effective method in health education that is used to provide health information to a group of people with special characteristics, with the aim of achieving certain knowledge and skills used to achieve a health goal. A Peer Health Educator is also able to motivate and facilitate members of their group to behave healthily in accordance with the expected goals. A Peer Health Educator is also able to share information in an applicable, practical and appealing way to the audience and therefore it is often easier for them to produce behavioural changes (Duncanson et al, 2014).

Good knowledge, an understanding of the community and an awareness of the attitude to healthy lifestyles in order to prevent heart disease will be able to affect their behaviour in daily life. The results of the research in Table 3 shows that Peer Health Education can influence the consumption pattern of sweet foods in the community group who are at risk of heart disease (p-value 0.011). In the first measurements, the Peer Health Education action was given, and the pattern of the excessive consumption of sweet foods was more than once per day for as many as 39.3% of respondents. At the end of the measurements, the number decreased to 10.7% of the respondents. This shows that the pattern of the excessive consumption of sweet foods is one of the risk factors for heart disease. Consuming excess sweet foods will increase the risk of increased blood pressure. The results of another study indicate that there is a significant relationship between the pattern of consumption of sweet foods with the occurrence of increased systolic blood pressure in patients with hypertension (Fikriana, 2016). This happens because the consumption of excessive sweet foods will cause the levels of glucose and fructose in the blood to increase, which will affect the metabolism of a person's body, causing damage and the homeostasis of the blood vessel walls, affecting insulin disturbance in the body as well as increasing the occurrence of the lipogenesis process (Siervo et al, 2013).

Table 6 shows that there was a difference in blood pressure before treatment and after treatment (p-value 0.010). Before the treatment was obtained, the number of respondents who had normal blood pressure was as many as 32.1%. After treatment, there was an increase in the number of respondents who had normal blood pressure, up to 46.4%. The respondents who had not had the treatment had blood pressure that fit the classification of hypertension stage 2, which decreased the number of respondents from the previous 14.3% to 7.1%. This shows that the Peer Health Educator can motivate the respondents to control their blood pressure. The results of this study are in line with the research conducted by Mindy & Alyson (2015), which states that knowledge will affect a person's ability to control his or her blood pressure.

The pattern of the excessive consumption of fatty foods, stress/anxiety and a lack of exercise are also risk factors that can cause heart disease. However, the results of this study indicate that there is no difference in the behaviour pattern of fast food consumption (p-value 0.078), physical activity (p-value 0.268), and stress/anxiety (p-value 0.441) in the group receiving Peer Health Education. This is in line with the results of the study in Table 6, which shows no difference in blood cholesterol levels before treatment and after treatment (p-value 0.291). The increased knowledge obtained by the respondents does not directly affect the behaviour of the

respondents in relation to the pattern of fat consumption, stress/anxiety and exercise. Knowledge and an understanding of what a healthy lifestyle is, is not balanced with the ability and awareness to change behaviour to generate a healthy life pattern (Kaplan et al, 2006). The results of this study are not in line with the research that has been done by Mindy & Alyson (2015), which showed that there is a positive relationship between knowledge and the behaviour of someone doing physical activity/sports, healthy food consumption, and with a sensible blood glucose and blood cholesterol level.

The lack of the influence of knowledge already gained from Peer Health Education on the respondent's behaviour can be caused by several factors. This can include individual internal factors such as self-awareness, self-motivation and habits. A person will tend to behave more carefully to live a healthy life if they are under threat of health problems. However, if a person is not actively having a health threat, they tend not to behave healthily. This is in accordance with the results of the research conducted by Mosca et al (2006), which showed that the awareness of the threat of risk of heart disease in a person becomes a factor that determines whether or not a person will live a healthy life. The results of other studies explain that the susceptibility to and seriousness of heart disease as well as self-motivation will affect the way that a person to behaves in a healthy lifestyle (Ali, 2002).

Several steps can be used to screen for heart disease, including screening for common risk factors, calculating the risk of heart disease for ten years and long-term risk calculation using an online calculator. Risk calculations can be done using the Framingham Score (Bickley, 2015). In addition, there are also other guidelines used to calculate the risk of heart disease in the next ten years, which is in relation to using the Jakarta Cardiovascular Score. The Jakarta Cardiovascular Score is a modification of the Framingham Score developed in Indonesia (Kanjilal et al, 2008). The results of the research shown in Table 8 describe the median and minimum scores of the risks of heart disease, which shows a decrease in risk in the treatment group from median 1 to 0.5 and a minimum value of -3 to -5. This decline in risk scores suggests that Peer Health Education reduces the risk of heart disease in risky people. While in a group and when not treated by Peer Health Education, the risk of developing heart disease tended to increase in relation to the median and minimum values, which means that people who do not get Peer Health Education tend to have an increased risk of heart disease.

CONCLUSION

Peer Health Education is an effective method used for health promotion in order to reduce the risk of heart disease. Peer Health Education can increase knowledge about healthy lifestyles to prevent heart disease, to improve healthy life behaviours especially the sweet food consumption pattern, control blood pressure and reduce the risk of heart disease in risky groups. Good knowledge of healthy lifestyles is accompanied by proper behaviour, maintaining a balanced pattern of food consumption and controlling the risk factors such as stress/ anxiety, smoking habits, sports activities and the consumption pattern of alcohol, which is a major factor that plays a role in the prevention of heart disease. Therefore it is necessary to for all of the components to work together and to provide support so that people can learn how to live a healthy lifestyle in order to reduce the risk of heart disease.

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Original Research

Self-Efficacy and the Competency of Nursing Students Toward the Implementation of Evidence-Based Practice

Yusshy Kurnia Herliani, Hasniatisari Harun, Anita Setyawati and Kusman Ibrahim

Faculty of Nursing, Universitas Padjadjaran, West Java, Indonesia

ABSTRACT

Introduction: Professional nurses should have adequate competency in order to apply Evidence Based Practice (EBP) in their nursing care. However, many nurses provide nursing care based on traditions, habits and personal experience. Less confidence in the feeling of nurses about their competency when employing EBP could inhibit successful EBP implementation in nursing care. Therefore, introducing and applying EBP during clinical placements in the *Ners* program is essential to form a professional attitude and to provide a basic level of experience when applying EBP in patient care. However, the self-efficacy and competence of the students when applying EBP has not yet been evaluated properly and there is little known about the nursing students' competences and self-efficacy toward EBP implementation during clinical practice. Thus, the study aims to describe the self-efficacy and competency of nursing students toward the implementation of EBP, while also investigating the relationship between self-efficacy and the competency of nursing students in the implementation of EBP.

Methods: This descriptive correlational study involved 120 nursing students who were actively registered on the *Ners* program 2016/2017. The data was collected by using the self-reporting Evidence-Based Practice Questionnaire (EBPQ), which was then analysed descriptively and inferentially using statistics.

Results: The results of this study revealed that more than half (55%) of the participants had a high score of self-efficacy and almost half (49%) were categorised as having a high competence when implementing EBP. The self-efficacy score was significantly correlated to the score of competency ($r = 0.607$, $p < 0.01$).

Conclusion: This study recommends that the development of the students' competence in implementing EBP is essential to promote self-efficacy when applying EBP, and vice versa.

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CONTACT

Yusshy Kurnia Herliani
yusshy.kurnia@unpad.ac.id
Faculty of Nursing, Universitas Padjadjaran, West Java, Indonesia

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INTRODUCTION

Nursing, as an integral part of the national health system, contributes to support the needs of the health services, since nurses spend the most time with patients to provide direct care (Sin & Bliquez, 2017). Nurses, as the largest group of health care providers, have a significant role in promoting health care and providing better services for patients (Khammarnia, Mohammadi, Amani, Rezaeian, & Setoodehzadeh, 2015). Nursing care is a physiological, psychological, social, cultural and spiritual service provided to the clients in order to address the actual or potential disruption of basic human needs. The future challenges faced by the nursing care services are global competition that requires professional nurses to provide effective problem solving, to ensure patient safety and quality nursing care (Aglen, 2016).

Professional nurses can be prepared through the Nursing Educational Program. The nursing educational program via a Bachelor's degree in Indonesia comprises of academic and clinical

education (*Ners* Program). The *Ners* Program refers to the professional clinical education in the Bachelor's degree program, which is aimed at comprehensively building the students' abilities and attitude to make them a professional nurse through field and clinical learning experience (Suba & Scruth, 2015). The *Ners* program in Indonesia is conducted after the student has completed the academic nursing education program in order to prepare the healthcare professional.

Nevertheless, many healthcare professionals still decide that clinical intervention is based on traditional practices, assumptions, personal experiences and individual beliefs and skills (Azmoude, Farkhondeh, Ahour, & Kabirian, 2017). Therefore, the students of the *Ners* program should learn and practice the implementation of Evidence-based Practice (EBP) during their clinical practice. Evidence-based Practice (EBP) is a mechanism of nursing practice focused on providing safe and high-quality patient care based on the evidence of research and professional expertise, rather than tradition, myths, hunches, advice from peers, or outdated books (Masters, 2015).

EBP implementation is essential for nurses in the clinical setting to effectively communicate with their patients and the healthcare team about the rationale for decision-making and care plans (Oh, Yang, Sung, Park, & Chang, 2016). EBP has an integral role in providing high-quality patient care by encouraging problem-solving to make better healthcare decisions in health care implementation, based on recent best available research within the clinical context (Elham Azmoude et al., 2017). Unfortunately, many nurses cannot implement EBP in the clinical setting since they feel insecure about their competency in employing the EBP skills that are used in their decision-making process as a professional (Oh et al., 2016).

Nursing education institutions have the responsibility to prepare the nursing students in terms of EBP mastery (E. Azmoude, F. Farkhondeh, M. Ahour, & M. Kabirian, 2017). Teaching EBP to undergraduate students is essential as a major preparation to perform the professional role of a Registered Nurse (Sin & Bliquez, 2017). However, a previous study reported that undergraduate nursing students experienced a lack of support and the opportunity to practice EBP, and also a lack of confidence when it came to independently utilising EBP (Ryan, 2016). A previous study related to evidence-based practice was conducted by Legita in 2012, on 66 General Hospital nurses in Pontianak. The results showed that the nurses did not have sufficient preparation in terms of knowledge and the habit of doing research and reading in support of the implementation (Legita, 2012). Moreover, previous research conducted among midwives in East Iran also revealed that the level of knowledge and confidence in one's ability to apply EBP were correlated with its effective implementation (Elham Azmoude et al., 2017).

Another significant variable affecting the implementation of EBP is self-efficacy. Self-efficacy is defined as an individual's belief in their own ability to perform specific skills (Elham Azmoude et al., 2017). Numerous studies have reported that the majority of nurses did not have the desired level of self-efficacy in the implementation of EBP (Farokhzadian, Khajouei, & Ahmadian, 2015). In addition, the majority of the nurses (60%) were not familiar with the concept of EBP, and their self-efficacy skills related to EBP were poor (Farokhzadian et al., 2015).

The students of the *Ners* program of the Faculty of Nursing Universitas Padjadjaran have learned about EBP theory in the second year of the Bachelor's degree nursing program. They exercised analysing the case and solving the nursing problem using EBP analysis. However, the self-efficacy and competence of the students in applying EBP has not been evaluated properly and there is little known about the nursing students' competences and their self-efficacy toward EBP implementation during clinical practice. The study aims to describe self-efficacy and the competency of the nursing students toward implementation of EBP, and also to investigate the relationship between self-efficacy and the competency of the nursing students in the implementation of EBP.

MATERIALS AND METHODS

This study was a descriptive correlational study. The sample of this study was made up of 120 nursing students who had completed the *Ners* program at the Nursing Faculty of Universitas Padjadjaran. Total sampling was used as the sampling procedure of this study. All of the participants were approached to ascertain their willingness to participate in the study. Then, the researcher explained to the potential participants the purpose of the study, gained their informed consent, and outlined the procedure, risks, benefits, and confidentiality. The participants had the right to refuse to participate in the study or to withdraw at any time without any negative consequences. Quantitative data collection was performed by asking the students to fill in the questionnaire.

Evidence-Based Practice Questionnaire (EBPQ) was the self-reported instrument used in this study to assess competence and self-efficacy when applying evidence-based practice. EBPQ was composed of 24 items, each with a 7 point rating scale. The internal consistency was 0.87 (Upton & Upton, 2006). The filled questionnaires were returned directly, and then the researcher checked the questionnaires for completion, and coded the questionnaires to ensure the anonymity of the participants. This study was approved by the Research Ethics Committee of Faculty of Medicine, Universitas Padjadjaran No 861/UN6.C.10/PN/2017.

The data was analysed using descriptive and correlational statistics. Descriptive statistics were used to describe self-efficacy and competency of the

Table 1. Frequency, percentage, mean, and standard deviations of the patients' demographic data (n = 120)

Characteristic	N	%
Age (range 21-45)	Mean = 25.53	SD = 5.79
Gender		
Male	11	9.2
Female	109	90.8
Program		
Regular	96	80.0
Transfer	24	20.0
Occupation		
Nurse	23	19.2
Fresh graduate	97	80.8
GPA		
<3	16	13.3
3.0-3.5	95	79.2
>3.5	9	7.5

Table 2. Mean score and standard deviation of students' competency in implementing EBP in clinical practice (n = 120)

No	Competency	M	SD
1	Ability to identify gaps in your professional practice	4.99	0.992
2	Ability to search new evidence	4.93	0.968
3	Ability to obtain new evidence of nursing practice	4.94	1.117
4	Ability to analyze evidence critically	4.87	0.913
5	Ability to determine validity of evidence of nursing practice	5.12	1.034
6	Ability to determine beneficial of invention in the literature	5.36	1.019
7	Ability to update new evidence in clinical practice for patient	4.86	1.311
8	Ability to apply evidence into practice	5.39	1.189

Table 3. Mean score and standard deviation of students' self-efficacy in implementing EBP in clinical practice (n = 120)

No	Self-Efficacy	M	SD
1	Ability to search new evidence	5.03	0.879
2	Ability to identify gaps in your professional practice	4.91	0.789
3	Ability to obtain new evidence of nursing practice	4.96	0.834
4	Ability to analyze evidence critically	4.79	0.849
5	Ability to determine validity of evidence of nursing practice	4.76	0.889
6	Ability to determine beneficial of invention in the literature	5.10	0.854
7	Ability to apply evidence into practice	5.17	0.929

Table 4. Mean, standard deviation, frequency, and percentage level of self-efficacy and competency in implementing EBP in clinical practice (n = 120)

	Low		High		Mean	SD	Category
	n	%	n	%			
Self-efficacy	54	45.0	66	55.0	34.72	4.813	High
Competency	62	51.7	58	48.3	40.47	5.930	High

Table 5. Correlation (r) between self-efficacy and competency of nursing students in implementing EBP in clinical practice (n = 120)

	Competency
Self-efficacy	0.607**

**. Correlation is significant at the 0.01 level (2-tailed).

sample by using frequency, percentage, mean, and standard deviation. Preliminary testing was done to meet the assumption of parametric testing prior to running the parametric tests. Pearson's product-moment correlation statistic (r) was calculated to examine the relationship between self-efficacy and the competency of nursing students towards the implementation of evidence-based practice.

RESULTS

Most of the participants in this study were women (90.8%), with an average age of 25.53 years, and ranging from 21 to 45 years. The majority of the participants were registered on the regular program (80%). 79.2 % of the participants had a GPA range from 3.0 to 3.5. Table 2 presents that the mean competency scores in implementing EBP in clinical

practice for all subscales were high (a score more than 3.5). The highest mean score of the sub-scales of competency in implementing EBP in clinical practice was the ability to apply evidence into practice (M = 5.39, SD = 1.189) and the lowest mean score of the sub-scales of competency in implementing EBP in clinical practice was the ability to update based on new evidence in clinical practice for the benefit of the patient (M = 4.86, SD = 1.311).

Table 3 depicts that the mean scores of self-efficacy in implementing EBP in clinical practice for all sub-scales was high (score above 3.5). The highest mean score of the sub-scales of self-efficacy in implementing EBP in clinical practice was the ability to apply evidence into practice (M = 5.17, SD = .929) and the lowest mean score of the sub-scales of self-efficacy in implementing EBP in clinical practice was to determine the validity of the evidence of nursing practice (M = 4.76, SD = .889).

Table 4 presents the mean, standard deviation, frequency, and percentage level of self-efficacy and competency in implementing EBP in clinical practice. The mean score of self-efficacy in implementing EBP was 34.72 (SD=4.813) with more than half (55%) of the participants having a high score of self-efficacy. The mean score of competency in implementing EBP was 40.47 (SD=5.930) with almost half (49%) of the participants categorised as high competence for implementing EBP. Table 5 depicts the results of the bivariate correlational analysis using Pearson correlation coefficients (r) between self-efficacy and competency in implementing EBP in clinical practice. The self-efficacy score was significantly correlated to the score of competency in implementing EBP ($r = .607$, $p < 0.01$).

DISCUSSION

Most of the participants in this study were women (90.8%), with an average age of 25.53 years, ranging from 21 to 45 years. The majority of the participants were registered on the regular program (80%). There were 79.2% of the participants had GPA range from 3.0 to 3.5. The professional Nursing Educational Program (*Ners* Program) is a part of the nursing education program where the learning process occurs inside the clinic. The *Ners* Program refers to professional clinical placement program in bachelor degree program, which was aimed at comprehensively building the students' ability and attitude for them to become professional nurse through field and clinical learning experience (Suba & Scruth, 2015). The *Ners* Program is conducted for one year in which the students get education and experience as a nurse in practice, whether in hospitals, community health centres, and various other health services. The *Ners* program students are those who have graduated from an academic program at Bachelor's degree and passed the examination of the General Registrar. The students will implement the prior knowledge that they had from the academic program. Student who complete the *Ners* Program receive the title of *Ners* (Upoyo & Sumarwati, 2011).

Evidence-based practice (EBP) is defined as the delivery of health care that integrates the best evidence from well-designed studies with a patient's preferences and values, a clinician's expertise, and the patient's data to solve the problem (Melnyk, Gallagher-Ford, Long, & Fineout-Overholt, 2014). EBP is defined as a framework to test, evaluate and apply research findings with the aim of improving nursing services to patients. There are seven steps in the EBP process: (a) cultivate a spirit of inquiry; (b) formulate an answerable question; (c) systematically search for the research evidence; (d) appraise the validity, relevance, and applicability of the research evidence; (e) integrate the research evidence with the clinical expertise of the practitioner and the wishes and desires of the patient and the family; (f) implement the EBP decision and evaluate the outcomes; and (g) disseminate the results (Melnyk, Fineout-Overholt, Stillwell, & Williamson, 2010).

In the School of Nursing (SON), the first four steps are considered competencies for Bachelor's degree level. This is congruent with the Bachelor's degree competencies identified by the American Association of Colleges of Nursing (Stevens, 2009). The undergraduate curriculum in the SON is designed to assist students in their development of beginner's knowledge and skills with respect to the first four steps of the EBP process (Bloom, Olinzock, Radjenovic, & Trice, 2013). The EBP project was designed based on the first four steps of the 5 A's of the EBP process (ask, acquire, appraise, apply, assess) (Sin & Bliquez, 2017). Asking a question is the first step of the EBP process. In the first step, the faculty framed questions in a scenario format instead of having the students form questions in order to enhance the clinical relevance of EBP in their daily practice. Formulating a question will yield the most suitable answer (Melnyk et al., 2010). The PICO technique (Patient, Intervention, Comparison, and Outcome) is used to frame and answer a clinical or health care-related question. The next important step in EBP is acquiring evidence. Selecting the most relevant evidence-based resources through literature searches or clinical guidelines is the activity of acquiring evidence (Melnyk et al., 2010; Sin & Bliquez, 2017).

Then, appraising the evidence is the following step of acquiring evidence. In this section, the students should identify the best intervention from the synthesised literature by performing a critical evaluation of the evidence and its validity, relevance and feasibility, and then state the rationale for implementing the intervention (Melnyk et al., 2010; Sin & Bliquez, 2017). The fourth step of the EBP process is applying evidence. This section is an implementation phase. Students should integrate research evidence with clinical experience, the patients' values and preferences (Melnyk et al., 2010). The last step is assessing the treatment outcome. EBP for Bachelor's degree level is limited to the third step.

Since the EBP project is based on hypothetical clinical scenarios, the students are not asked to implement the intervention (Sin & Bliquez, 2017). However, the competencies for the *Ners* Program students could be implemented up to assessing the treatment process with clinical instructor supervision.

EBP Competencies

The results of this study present that almost half (49%) of the participants had a high score of competence in implementing EBP. The mean score of competency in implementing EBP in clinical practice was high. Competencies are defined as a system that supports health care professionals in providing high-quality and safe care that consists of knowledge, psychomotor skills, and affective skills. Meanwhile, the nurses' competencies are the various patient care activities related to the critical issue of how practicing nurses approach decision-making (Melnyk et al., 2014). EBP competencies in this study include identifying gaps with professional practice, searching for new evidence, obtaining new evidence of nursing practice, analysing the evidence critically, determining the validity of the evidence, determining the benefits of invention in the literature, updating new evidence and applying the evidence into practice.

The highest mean score of the sub-scales of competency in implementing EBP in clinical practice was the ability to apply evidence into practice (M = 5.39, SD = 1.189) and the lowest mean score of the sub-scales of competency in implementing EBP in clinical practice was the ability to update new evidence in clinical practice for the patient (M = 4.86, SD = 1.311)**.** The most important supporting factor was mentoring by nurses who have adequate EBP experience, and the biggest barrier was the difficulty in judging the quality of research papers and reports. There was a moderate demand for training in all areas of EBP (J. Farokhzadian et al., 2015).

Students at Bachelor's degree level are introduced to EBP concepts to construct the foundation for the EBP process. They begin to identify the potential clinical questions as they become aware of current generalist nursing care problems. Using the EBP process to address practice issues, the students are guided through the sequence of steps to review research and to develop an EBP implementation plan (Hande, Williams, Robbins, Kennedy, & Christenbery, 2017). Then, the students search the available scholarly literature to gain information related to the problems, and to critically appraise the information for determining a best intervention. The ability to apply interventions based on the most applicable evidence was also one of the highest priorities identified (Farokhzadian, Khajouei, & Ahmadian, 2015). Interventions should provide the students with sufficient competences for implementing every step of EBP, with special focus on the implementation of evidence in patient care (Häggman-Laitila et al., 2016).

Self-efficacy of EBP Implementation

More than half of the participants (55%) had a high score of self-efficacy in implementing EBP in clinical practice. The important variable affecting the implementation of EBP was self-efficacy, which is defined as an individual's belief in their own ability to execute skills at a designated level of performance (E. Azmoude et al., 2017). Self-efficacy (SE) is the belief that one is capable of performing a task or a desired action (Bandura, 1977). This study depicted that the mean scores of self-efficacy in implementing EBP in clinical practice were high. The self-efficacy of implementing EBP among the nursing students in this study included searching for new evidence, identifying gaps in professional practice, obtaining new evidence of nursing practices, analysing the evidence critically, determining the validity of the evidence, determining the benefits of intervention in the literature and applying the evidence into practice.

The highest mean score of the sub-scales of self-efficacy in implementing EBP in clinical practice was ability to apply evidence into practice (M = 5.17, SD = .929) and the lowest mean score of the sub-scales of self-efficacy in implementing EBP in clinical practice was to determine the validity of the evidence of nursing practice (M = 4.76, SD = .889). In contrast, several studies have revealed that the majority of healthcare professionals did not have the desired level of self-efficacy in the implementation of EBP (E. Azmoude et al., 2017). Previous research has also revealed that nurses have a low mean when it comes to their self-efficacy score (Farokhzadian et al., 2015).

Correspondingly, most clinical nurse specialists identified had no confidence in their ability to translate clinical problems into well-formulated questions (Mohsen, Safaan, & Okby, 2016). In addition, a study reported that undergraduate nursing students experienced a lack of support and the opportunity to practice EBP and also a lack of confidence in employing EBP independently (Ryan, 2016).

The low self-efficacy score of the nurses and nursing students was identified as the result of a lack of personal experience in performing evidence-based practice in clinical practice. The personal mastery of performing tasks indicates that self-efficacy is essential in the process of behaviour change (Shinnick & Woo, 2014). Furthermore, the low scores of self-efficacy among healthcare professionals in implementing EBP was related to several barriers at the individual level included a lack of time to read the literature (83.7%), a lack of ability to work with a computer (68.8%), and insufficient proficiency in the English language (62.0%) (Khammarnia et al., 2015). Whereas the nursing students in this study could have more time to read the literature, have the ability to work with a computer and have a sufficient English proficiency. These factors are important to investigate in future research.

Correlation Findings

The present study revealed that the self-efficacy score was significantly correlated to the score of competency in implementing EBP ($r = .607$, $p < 0.01$). This result is in line with the previous research conducted among midwifes in Iran, which conveyed that self-efficacy scores were significantly correlated with practice (Azmoude et al., 2017). The positive association between the previous experience of EBP education and the self-efficacy in implementing EBP (SE-EBP) indicated that the exposure to EBP may increase the confidence in EBP of the clinical nurses (Oh et al., 2016). Furthermore, adopting EBP empowers nurses to become confident professionals, enabling the nurses to take legal accountability for their practice (Oh et al., 2016), resulting in the increase of EBP competencies.

A previous study revealed different aspects, in that education level had a significant relationship with competency in conducting EBP. The higher education levels of a person means better competency in performing EBP (Elysabeth, Libranty, & Natalia, 2015). The study of Eizenberg (2010) revealed that education could lead a person to be skilled in finding the source of research, being organised and being professional in their work, increasing access-access to improve and implement practices based on EBP (Eizenberg, 2011). Previous research also observed that there was no significant relationship between self-efficacy and academic degree (Farokhzadian et al., 2015). However, the education levels of the participants in the present study were similar, since they had just finished the *Ners* Program. Therefore, the education level could not be compared.

In the present study, age, program, and working experience are not likely to be correlated with self-efficacy and competencies when conducting EBP.

This result is similar to the results of previous studies, revealing that the midwives who were older and had more working experience were not significantly more likely to have greater EBP knowledge, self-efficacy or practice (Farokhzadian et al., 2015).

CONCLUSION

The results of the study revealed that more than half of the participants had a high score of self-efficacy and almost half were categorised as having high competence in relation to implementing EBP. Moreover, the self-efficacy score was significantly correlated to the score of competency when it came to implementing EBP. Despite this study having a big sample population, the participants were only from one institution, so the results cannot be generalised. Therefore, future research should be involving nursing students from various nursing education institutions in order to investigate the factors affecting self-efficacy and competency in implementing EBP in clinical practice. In addition, this study recommends that the development of the students competence in implementing EBP is essential to promote self-efficacy in applying EBP, and vice versa.

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Original Research

Comparison of Attitudes Towards Meditation Healing Exercise between the Elderly Living with Chronic Illness in Bangkok and Surabaya

Ni Putu Wulan Purnama Sari[1] and Jintana Artsanthia[2]

[1] Faculty of Nursing, Widya Mandala Catholic University Surabaya, Indonesia
[2] Faculty of Nursing, Saint Louis College, Bangkok, Thailand

ABSTRACT

Introduction: Meditation healing exercise (MHE) using the SKT technique is popular in Bangkok, Thailand, while in Surabaya, Indonesia, it is relatively new and unpopular. The attitude towards MHE depends on various internal and external factors. This study aimed to compare the attitude towards MHE between the elderly who are living with hypertension (HT) and/or diabetes mellitus (DM) in Bangkok and Surabaya.

Methods: This was a comparative study involving 96 and 100 elderly individuals with HT and/or DM in the communities of Surabaya and Bangkok respectively. The sample was chosen according to the aforementioned criteria. The sample size was 196. The instrument used was a valid and reliable questionnaire. Descriptive statistics, the Levene test, and an independent sample T test were used for the data analysis.

Results: The majority showed a positive attitude towards MHE; the higher Mean and lower SD was found in Bangkok (19.43 and 2.41). Out of the total, 87.5% and 96.0% elderly had good attitude towards MHE in Surabaya and Bangkok respectively. There was a significant attitude difference in relation to the aspect of preferring to practice MHE between Bangkok and Surabaya (p=0.004). Overall, there was no significant attitude difference between Bangkok and Surabaya (p=0.17).

Conclusion: The elderly attitude towards MHE was mostly positive and good. The elderly in Bangkok prefer to practice MHE more than in Surabaya. There was no significant attitude difference in the elderly who are living with HT and/or DM between Bangkok and Surabaya. The implementation of MHE using the SKT technique has a high possibility of being accepted personally by the elderly in both sites.

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CONTACT

Ni Putu Wulan Purnama Sari
wulanpurnama@ukwms.ac.id
Faculty of Nursing, Widya Mandala Catholic University Surabaya, Indonesia

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INTRODUCTION

Non-communicable diseases (NCDs), or chronic diseases, are not passed from person to person. They are of a long duration and have a generally slow progression. The four main types of non-communicable diseases are cardiovascular (e.g. hypertension), cancers, chronic respiratory diseases and diabetes mellitus (DM). 80% of all NCD deaths occur in low- and middle-income countries. Almost three quarters of NCD deaths - 28 million - occur in low- and middle-income countries. 16 million NCD deaths occur before the age of 70; 82% of these "premature" deaths occurred in low- and middle-income countries. The greatest public health benefits are gained through the prevention of NCD (particularly cardiovascular diseases, cancers, and DM), injuries, and mental health disorders. These benefits can be achieved if the risk factors are identified and mitigated through appropriate interventions. If NCDs and mental illnesses are detected at an early stage and the appropriate controls initiated, then their severity can be significantly reduced (WHO, 2015).

Both Thailand and Indonesia are developing countries that face the threat of economic loss due to the burden of NCD. Efforts to optimise the clinical outcomes and quality of life are necessary to reduce

the health expenditure associated with NCD. One way of doing this is by implementing non-pharmacological interventions, such as meditation practice on a daily basis. Meditation is an umbrella term that encompasses a family of practices that share some distinctive features, but vary in important ways in the context of their purpose and practice. Cardoso, et al. (2004) developed a detailed operational definition of meditation that was broad enough to include traditional belief-based practices and those that have been developed specifically for use in clinical settings. Using a systematic approach based on consensus techniques, they defined any practice as meditation if it (1) utilises a specific and clearly defined technique, (2) involves muscle relaxation somewhere during the process, (3) involves logic relaxation to analyse the possible psychophysical effects, not "to intend" to judge the possible results and not "to intend" to create any type of expectation regarding the process), (4) is a self-induced state, and (5) involves the use of a self-focus skill or "anchor" for attention.

Evidence of meditation healing exercise (MHE) effect on both physiological and neuropsychological aspects has been evaluated in 311 studies. The majority of studies have been conducted in healthy participants. Meta-analysis has revealed that the most consistent and strongest physiological effects from meditation practices in healthy populations occur in the reduction of heart rate, blood pressure, and cholesterol. The strongest neuropsychological effect was an increase in verbal creativity. There was also some evidence in before-and-after studies to support the hypothesis that certain meditation practices decrease visual reaction time, intraocular pressure, and increase breath holding time (Artsanthia & Sari, 2017).

Thailand is famous for its meditation technique. Most of the citizens are Buddhist, and meditation is really close to Buddhist religious practice. One of the meditation experts from Bangkok, S. K. Triamchaisri, proposed eight new techniques for doing MHE named SKT 1-8. Each technique has its own health benefit. For instance, a study of Triamchaisri, et al. (2013) found that after practicing the SKT3 and SKT5 meditation exercises, the function of visual illusions was reduced, hearing problems and posture disorientation was 30% improved, and the quality of life of the patient related to eating, standing, sleeping was improved within one week. The improvement in relation to walking, posturing, hearing, sleeping, memory losing, and walking status was reported after regularly practicing three times a day for one month. 80% of the patient's spatial orientation was met after practicing for one month. There was a 90% level of holistic improvement in the visual and vestibular functions, which improved as per a healthy person within three months of practicing the meditation exercise.

Meditation practice in Indonesia, especially in Surabaya, is relatively new and unpopular in society, especially amongst the elderly who are living with HT and/or DM in the communities. Most of the citizens in Surabaya are Moslem, and their daily religious practice does not involve any practice related to meditation. MHE is potentially being recognised as a new way of treating diseases. Meditation-related knowledge is potentially low, as well as the attitude towards MHE itself remaining unclear. Although most of Thailand citizens are familiar with meditation in practice, the elderly's attitude towards MHE, especially the SKT technique, remains unclear.

Attitude has always been a subject of interest to many researchers. It is considered exciting and mysterious. Attitude is the positive or negative evaluation or feeling that people have towards other people, objects, issues or events. Attitude includes the general way that people feel towards socially significant objects. Having a certain attitude in life could help people to live in harmony and be better understanding of the things around them. Attitude affects the way that people perceive and act towards other people, as well as the objects or events that they encounter (Abidin, et al, 2011).

This study aims to compare the attitude towards MHE between the elderly who are living with HT and/or DM in Bangkok (familiar with daily meditation practice) and Surabaya (relatively new to daily meditation practice). Our upcoming study aims to analyse the effect of MHE towards a handful of physical and psychological parameters in the elderly who are living with HT and/or DM in Bangkok and Surabaya. This prior study on attitude was important to conduct in order to ensure that there was a positive/good attitude towards MHE in both sites, so then the elderly would accept the study intervention personally and be determined to do meditation practice on a daily basis. This is important to assure that the MHE effects on the physical and psychological parameters are measured properly in the upcoming study. In our upcoming study, we will implement the SKT1 technique as proposed by S. T. Kantharadussadee, which could be useful for managing HT and/or DM with a good outcome, especially related to lowering blood pressure (BP) and blood sugar (BS) level.

MATERIALS AND METHODS

It was a comparative study involving 196 elderly individuals with DM and/or HT in communities around Bangkok and Surabaya. There were 100 and 96 cases compiled from Bangkok and Surabaya respectively. The sample distribution between the two study sites has been presented in Table 1.

Table 1. Sample distribution

Case	Bangkok	Surabaya	Total
DM	30	30	60
HT	35	33	68
DM&HT	35	33	68
Total	100	96	196

The sample was chosen according to a set of criteria, who were then totally included in the study (total sampling). The inclusion criteria consisted of (1) elderly people who are willing to practice MHE using the SKT1 technique, and (2) they are consuming medication from a medical doctor to treat an appropriate disease. The exclusion criteria consisted of (1) elderly people who have heart and/or lung disease, and (2) they cannot communicate using Pasa Thai or Bahasa Indonesia.

The instrument used to measure attitude was developed by the researchers. It consisted of five items in the Likert scale format (1 = disagree until 5 = strongly agree). The attitude questionnaire was proven to be a valid and reliable instrument for measuring attitude towards MHE (r = 0.437-0.574; IOC = 0.574; Cronbach's Alpha = 0.880). A positive attitude is evident if the score ≥ 3, while a negative attitude is evident if the score ≤ 2 in each item. The total score was then categorised into four categories: 5-10 = strongly negative, 11-15 = negative, 16-20 = positive, and 21-25 = strongly positive. These four categories were then merged at the end into two big categories of good and bad attitude. Good attitude was if the total score ≥ 16, while bad attitude was if the total score ≤ 15. Descriptive statistics, the Levene test, and an independent sample T test were used for the data analysis ($\alpha = 0.05$). Ethical clearance was issued by the Ethical Committee of Saint Louis College (SLC), Bangkok, Thailand (November, 2016); certificate number: E.038/2559. The attitude data was collected in the beginning of 2017 in the communities around Bangkok and Surabaya, while the pre-experimental study of the effect of MHE using the SKT1 technique on various physical and psychological parameters was conducted for the rest of the year. The principal investigator for our upcoming study is Jintana Artsanthia, from SLC, Bangkok. In Bangkok, there were five communities used as the study sites. In Surabaya, there were three communities used as study sites; RW V, VI, and VII in the district of Mojo.

RESULTS

In total, the study respondents were composed of 15.82% men and 84.18% women. The age range was 60 – 78 years old. The educational background of the sample in Bangkok was mostly primary school level (53%), while in Surabaya, it was mostly secondary school level (64.58%). The income of the sample in Bangkok was 43% at THB 2000-6000 per month, while in Surabaya, it was 53.13% at less than IDR 800 thousand per month. In Bangkok, most of the respondents had relatives who suffered from DM/HT (66%), while in Surabaya, it was the opposite (69.79%). Details of demography characteristic of study respondents are presented in Table 2.

From Table 3, the average of the attitude score in Bangkok and Surabaya was 3.88 and 3.76 respectively, representing a positive attitude in both sites. The highest possible total score of attitude was 25. The results showed that the total score for attitude in Bangkok and Surabaya was 19.43 and 18.77, representing a good attitude in both sites. These results indicate that the study respondents could accept MHE on a personal level. There is a high possibility that the upcoming study respondents will do meditation practice regularly on a daily basis, allowing the MHE effects towards lowering BP and BS level to exist.

From Table 4, we can see that a 0% strongly negative attitude was found in Bangkok. This indicates that the communities in Bangkok were really familiar with meditation practice and the positive value of meditation already exists in the selected society. The most surprising fact was that a 19.79% strongly positive attitude was found in Surabaya. This result was even better than in Bangkok. This indicates that although the Surabaya communities are not really familiar with meditation practice and that the knowledge related to it is potentially low, the study respondents were optimistic towards meditation's benefit for their health.

From Table 5, we can see that even in Bangkok, most of the citizens are familiar with meditation practice. However, 4% of the study respondents had a bad attitude. It was not surprising that we found a higher result in Surabaya (12.5%), because meditation practice is relatively new and unpopular in society. The relieving fact is that 62.24% respondents had a good attitude towards MHE in both sites. There was a high possibility that the upcoming study respondents will do meditation practice regularly on a daily basis, so that the MHE effect of lowering BP and BS level could exist.

From Table 6, we can see that the attitude in Bangkok was better than that in Surabaya because of the higher Mean and lower SD. This result indicates that the respondents in Bangkok had a good attitude towards MHE, in which the positive value was not really different between the focused societies.

All of the attitude data was normally distributed ($p>\alpha$). There was significant attitude difference in the aspect of preferring to practice MHE (item 4) between Bangkok and Surabaya ($p = .004$). This result indicates that the respondents from Bangkok like to practice meditation more than Surabaya's respondents. Based on the total score of attitude, overall, there was no significant attitude difference in the elderly who are living with HT and/or DM between Bangkok and Surabaya ($p = .17$)

DISCUSSION

Attitudes have long been considered to be a central concept of social psychology. The concept of attitudes has changed over the years. The initial definitions were broad and encompassed cognitive, affective, motivational, and behavioral components. The current conception of attitude does not adequately distinguish between attitudes and factual beliefs on the one hand, or between attitudes and

Table 2. Demographic characteristics

Characteristic	Bangkok (n=100)		Surabaya (n=96)	
	Σ	%	Σ	%
Sex				
Male	20	20.0	11	11.45
Female	80	80.0	85	88.54
Age				
60-69	48	48.0	75	78.13
70 up	52	52.0	21	21.87
Education				
Primary school	53	53.0	25	26.04
Secondary school	25	25.0	62	64.58
Bachelor's degree	8	8.0	9	9.38
No study	14	14.0	0	0
Occupation				
Agriculture or farmer	1	1	0	0
Shopkeeper or own business	10	10.0	12	12.50
Government officer	2	2.0	1	1.04
Other: housewife, retired, etc	87	87.0	83	86.46
Income per month				
-<2,000 baht (< IDR 800 thousand)	18	18.0	51	53.13
- 6,000- 2,000baht (IDR 800 thousand – 2.4 million)	43	43.0	31	32.29
- 10,000- 6,001baht (IDR 2.41 – 4 million)	19	19.0	10	10.42
-> 10,000baht (> IDR 4 million)	20	20.0	4	4.17
Relative has DM/HT				
Yes	66	66	29	30.21
No	34	34	67	69.79

Table 3. Frequency of the elderly attitude towards MHE

Item	Attitude	Bangkok (n=100)						Surabaya (n=96)					
		1	2	3	4	5	Mean	1	2	3	4	5	Mean
1.	Feel calm when practicing MHE	-	2	18	71	9	3.87	5	7	14	55	15	3.71
2.	Feel good when practicing MHE	-	4	23	63	10	3.79	4	2	21	56	13	3.76
3.	Believe that working on the body and mind can allow them to cooperate	-	-	20	68	12	3.92	6	2	16	55	17	3.79
4.	Prefer to practice MHE	-	-	25	61	14	3.89	4	10	23	48	11	3.55
5.	Believe in the concept of MHE, and that it can improve immunity and heal symptoms	-	1	18	65	16	3.96	4	6	7	49	30	4.00
Average of attitude for each item							3.88 (+)						3.76 (+)
Average of the total attitude score							19.43 (Good)						18.77 (Good)

preferences on the other. To hold an attitude is to ascribe an objective moral property to the attitude-object. However, the conception of such properties rests on an incoherent theory of relations as being constitutive of their terms, and the belief in them has only pseudo-cognitive content. Attitudes serve as rationalizations for concealed or unconscious impulses and are themselves defended by further rationalization. Some apparent exceptions, namely 'aesthetic attitudes' and

Table 4. Level of the elderly attitude towards MHE based on the total score

	Bangkok (n=100)		Surabaya (n=96)		
Total score	**∑**	**%**	**∑**	**%**	**Meaning**
5-10	-	-	5	5.21	Strongly Negative
11-15	4	4	7	7.29	Negative
16-20	82	82	65	67.71	Positive
21-25	14	14	19	19.79	Strongly Positive
Total	100	100	96	100	

Table 5. Category of the elderly attitude towards MHE based on the level of attitude

Category	**Bangkok**		**Surabaya**			
	∑	**%**	**∑**	**%**	**Total**	**%**
Good attitude (positive + strongly positive)	96	96	84	87.5	122	62.24
Bad attitude (negative + strongly negative)	4	4	12	12.5	74	37.76
Total	100	100	96	100	196	100

Table 6. Descriptive statistics of the elderly attitude towards MHE

Attitude in site	**∑**	**Mean**	**Std. Deviation**
Attitude in Bangkok	100	19.43	2.41
Attitude in Surabaya	96	18.77	4.15
Total - average	196	19.10	3.55

Table 7. Statistical test results on the elderly attitude differences towards MHE

Attitude		**Levene's Test for Equality of Variances**		**Independent t-test for Equality of Means**						
		F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**95% CI**	
									Lower	**Upper**
item1	Equal variances assumed	19.440	.000	-1.398	194	.164	-.16167	.11567	-.38981	.06647
	Equal variances not assumed			-1.384	151.724	.169	-.16167	.11685	-.39253	.06919
item2	Equal variances assumed	2.294	.132	-.268	194	.789	-.02958	.11053	-.24757	.18841
	Equal variances not assumed			-.266	178.868	.790	-.02958	.11110	-.24882	.18965
item3	Equal variances assumed	14.773	.000	-1.226	194	.222	-.13875	.11320	-.36202	.08452
	Equal variances not assumed			-1.213	150.653	.227	-.13875	.11437	-.36473	.08723
item4	Equal variances assumed	23.456	.000	-2.917	194	.004	-.33792	.11585	-.56640	-.10943
	Equal variances not assumed			-2.892	159.911	.004	-.33792	.11686	-.56871	-.10712
item5	Equal variances assumed	7.823	.006	.248	194	.804	.02958	.11912	-.20535	.26452
	Equal variances not assumed			.246	156.197	.806	.02958	.12024	-.20792	.26708
total	Equal variances assumed	9.165	.003	-1.365	194	.174	-.65917	.48308	-1.61193	.29360
	Equal variances not assumed			-1.351	151.459	.179	-.65917	.48800	-1.62334	.30500

'authentic values', reveal themselves to be either (a) factual beliefs about aesthetic properties or about human motivation respectively, (b) preferences, or (c) moral attitudes as defined (Maze, 2008).

Conceptualisations of the attitude construct advances the possibility that attitudes can form in multiple ways. The three key means of attitude formation implicates cognitive, affective, or behavioral processes. An attitude is formed on the

basis of cognitions when one comes to believe either that the attitude-object possesses (un)desired outcomes. The expectancy-value model argues that an attitude toward a given object is the sum of the expected value of the attributes of the object. An overall attitude toward the object is reached by taking the sum of the expected values of all of the attributes that an attitude object is thought to have. They claim that all attitudes are based on beliefs about the attitude object, and that all attitudes are formed via the summation of its subjective probabilities and values (Wigfield & Cambria, 2010).

Most people seem to agree that an attitude involves at least three things: an attitude object which is defined by the attitude holder, a set of beliefs towards the object, and a tendency to behave in a certain way. Other underlying dimensions of attitude are knowledge level and strength or resistance to change. If the attitude intensity is high, then strength is also apt to be high. Strength may be high if one has lots of knowledge. There are also times when attitude seems to be change resistant despite a lack of knowledge. There is a reason to believe that an attitude that is high in intensity, strength, and knowledge is apt to be a good predictor of behavior; but attitude alone does not determine behavior (Hulleman, et al, 2010).

Based on Table 2, we can see that all of the respondents possessed a relatively low knowledge level based on their educational background (84.18% in total). From Table 3, we can see that regarding the 5 items in the attitude questionnaire, most of the respondents tend to choose a higher score (3/ 4/ 5) for each item. It is expected then that the respondents will practice MHE regularly, because 1) they intensely feel about MHE, 2) enough information was given prior to the study period, and 3) the high attitude intensity has made it change resistant.

Other than cognition, attitude forms from the effect that stems from an emotional reaction to the attitude object. One can be said to have an affectively-cased attitude when either positive or negative feelings are evoked when considering the attitude object. As seen in Table 3, 4 and 5, most of the respondents have a positive/good attitude toward MHE (91.84% in total). Although most of the bad attitude was found to be in Surabaya (12.5%), the overall attitude was mostly positive/good. There are three primary ways in which attitudes might be formed on the basis of affect: operant conditioning, classical conditioning, and mere exposure. Without clear feelings or beliefs about a potential attitude object, one may still have had past experiences with it. The past behavior can be used to infer the attitude toward an object through self-perception (Nagengast, et al, 2011).

One of the reasons that attitudes are practically and theoretically important is because they have predictable and very powerful effects on behavior (Nagengast, et al, 2011). People care passionately about some attitudes and consider them to be deeply important, and they accord no particular significance to other attitudes. Determining which attitudes most accurately predict which behavior under what circumstances has turned out to be a highly complex enterprise. Some research has revealed that some kinds of individuals are more likely than others to act on their held attitudes (Singh, et al, 2012). In addition, some kinds of situation are more likely than others to promote attitude-congruent behaviors (Tang, et al, 2014). In addition to differences across people and across situations, there are also marked differences across types of attitude – some kinds of attitude are more likely than others to motivate and guide behavior (Eaton & Visser, 2008).

It is generally understood that a person's attitude has a primary influence on behavior. Banaji & Eiphetz (2009) stated that if attitude is a predisposition to act favorably or unfavorably, then the attitude that one has should predict one's behavior. From the 1930s on, however, studies have shown the weak prediction of behavior from attitude (Abidin, et al, 2011); there are situational factors whose influence is stronger than mere attitude. People's expressed attitudes hardly predict their varying behavior (Wicker, 2010). Behavior and expressed attitude differs because both are subject to other influences. On any occasion, it's not only inner attitudes that guide us, but also the situation that we are face with.

The attitude model suggests that how you feel about some person, object, or idea will influence your behavior toward that object. However, it is not uncommon for people to have feelings one way and to behave differently. This difference may lead one to raise question about the relationship between attitude and behavior. It is apparent that there are intervening factors influencing the attitude – behavior relationship: habit, social norms, and the expected consequences of behavior. Habits are automatic ways of behaving in appropriate situations with minimum thinking. Social norms include the role expectations of a certain behavior that members of a group, community, or society share. The expected consequences of a behavior produce an apparent inconsistency between what a person says and what a person does. Therefore, attitude is not always a good predictor of behavior (Tesser & Schwarz, 2001).

The information that a person has about an object will influence the attitude that the person holds about that object. Many beliefs may underlie a given attitude. Individuals also use attitudes to express their basic values and to portray to others the sort of persons that they are. Generally, people maintain a consistent relationship between their beliefs, values, and attitudes. Attitudes are also influenced by personal needs, such as the need for reward, defending the ego, and understanding the environment. These three basic personal needs which attitudes serve are very important. Often, a set of beliefs and values are used to provide reasonable justification for an attitude. However, the real

motivation for the attitude in question may be basic personal needs (Prasad, et al, 2011).

The attitude towards MHE in the elderly who are living with NCD, especially HT and/or DM, in Bangkok and Surabaya, was mostly positive/good and insignificantly different overall. Both Thailand and Indonesia are located in the South East Asia region, which is relatively similar regarding culture, habits, customs, and daily life. The beliefs, values, social norms, personal needs and expected consequences of behavior are also relatively similar in the study context. By way of this positive/good attitude regarding MHE expressed through the five items in the attitude questionnaire, the upcoming respondents are expected to practice MHE regularly on a daily basis so then its benefits for health can be assured.

CONCLUSION

The elderly attitude towards MHE was mostly positive/good in both sites. The elderly in Bangkok prefer to practice MHE more than in Surabaya. Overall, there was no significant attitude difference towards MHE between the elderly who are living with HT and/or DM in Bangkok or Surabaya. The implementation of MHE, especially using the SKT1 technique, in the elderly communities of Bangkok and Surabaya has the high possibility of being accepted on a personal level. Its effects on the various physical and psychological parameters involved in HT and DM management also possibly exist.

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Original Research

Grieving as an Internal Factor of Nurse-Patient Interaction in a Dialysis Unit

Ika Yuni Widyawati[1], Nursalam Nursalam[2], Kusnanto Kusnanto[2], Rachmat Hargono[3] and Pei-Lun Hsieh[4]

[1] Doctoral Student, Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia
[2] Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia
[3] Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia
[4] Chung Hwa University of Medical Technology, Taiwan

ABSTRACT

Introduction: The quality of the nurse-patient interaction is one factor that affects the patient adherence, but a study that provides an overview of factors in the nurse-patient interaction in improving or maintaining dialysis patient adherence has not been found. The aim of this study was to provide an overview of the various factors involved in the interaction process between nurses and patients undergoing dialysis in relation to their adherence to fluid and dietary restrictions.

Methods: A qualitative research design with an interpretive phenomenology approach was used in this study. The researcher intends to interpret the findings of the research, in this case the activity of the dialysis patients, in order to get a picture of the various factors involved in the process of interaction between nurse and dialysis patient. The unit of analysis used in this study was the disclosure or exposure of the internal factors of the nurse-patient interaction process, especially in relation to fluid and dietary restrictions. There were 15 participants who were selected based on the inclusion criteria. In-depth interviews, with field notes, were used in this study as the data collection method.

Results: The analysis of the theme based on the goal of the research includes grieving, needs and values/morals, but in this article, the researchers only describe one theme - grieving.

Conclusion: This result provides an overview of the findings on nurse-patient interaction factors that can serve as baseline data for the development of nursing care, both in nursing assessments and interventions aimed at improving dietary adherence and the fluid restriction of dialysis patients.

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CONTACT

Ika Yuni Widyawati
✉iy.widyawati@gmail.com
Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia

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INTRODUCTION

Dialysis is a treatment that can improve the quality of life of patients with End Stage Renal Disease (Chow & Wong, 2010; Elliott, Gessert, Larson, & Russ, 2014; Ginieri-Coccossis, Theofilou, Synodinou, Tomaras, & Soldatos, 2008) despite the high cost of the therapy (Klarenbach, Tonelli, Chui, & Manns, 2014). Dialysis has a wide range of consequences on various aspects of the patient's life, including physical, biological, psychological and social (Wijaya, 2005), and even death (Bradbury et al., 2007). According to Perkumpulan Nefrologi Indonesia (2014), renal replacement therapy haemodialysis has become the most common treatment with a percentage of 82%. According to the data, in Indonesia, the percentage of regular haemodialysis measures reached 95% (703,139 patients) and in East Java, there have been more than 90,000 haemodialysis patients in this time (PERNEFRI, 2014).

Patients on dialysis have to face many challenges in their life, where they have to recognise the disease

and the treatment that should be followed, as well as learning to cope with and adapt to all of the changes and new behaviours in their life (Royani, Rayyani, Behnampour, Arab, & Goleij, 2013). Various stressors are experienced, making the dialysis patients unable to accept the changes and causing them to feel as if they have no control over their lives (Warrior, 2015).

The inability of the patient to execute self-control behaviours affects patients who are not always in favour of the treatment process (Warrior, 2015; Wijaya, 2005). Patients with chronic diseases are expected to be the manager of themselves who are focused on the concept of patient-centered care. The failure of management and the treatment of dialysis patients is more often due to the non-adherence of patients (Addo, 2015). Adherence issues patients undergoing haemodialysis mainly focus on adherence to fluid restrictions, diet, medication and long (hours) implementation dialysis (Al-Khattabi, 2014; Al-Orabi et al., 2015; Denhaerynck et al., 2007; Park et al., 2014; Vardanjani, Parvin, & Shan, 2015). The non-adherence of patients on dialysis to program fluid restriction and diet has an impact on the occurrence of complications, promotes an increased length of stay, decreases productivity and can even cause death (Alikari, Matziou, Tsironi, Theofilou, & Zyga, 2015; Payne, Eaton, Mee, & Blount, 2013; Saran et al., 2003). The quality of patient health depends on the patient's adherence to the treatment regimens recommended (Martin, Williams, Haskard, & Dimatteo, 2005). Few interventions to improve adherence diet and fluid restrictions in dialysis patients have been conducted. The success of interventions to improve adherence depends on a series of factors, such as the realistic assessment of the knowledge and understanding of the patient on the regimen of therapy given and clear communication between the health professionals and patients, as well as fostering a sense of trust in the therapeutic relationship (Martin et al., 2005).

Nurses play an important role in this regard. In addition to providing care, nurses also provide additional assistance to patients in the form of support that is interpersonal that aims to help patients effectively cope with stress, improve their welfare, as well as accelerating the recovery of their health (De los Ríos Castillo & Sánchez-Sosa, 2002). The partnership and collaboration that exists between health professionals and patients can maximise compliance, foster patient satisfaction, and improve the health of the patients (Martin et al., 2005).

The nurse-patient relationship is a means of exchanging information and the ability to (Millard, Hallett, & Luker, 2006), therefore the interpersonal nurse-patient interaction should be an important element in patient involvement in care. It helps to determine the success of the patients' treatment, including the patients' adherence to their treatment recommendations (Chatwin, 2008; Nordby, 2007; Stoddart et al., 2012).

A study of the literature gives an overview of the research results outside Indonesia with different communication cultures. The results from the literature studies (from various national journals) show that some studies confirm that nurse-patient interactions contribute to patient compliance. The research conducted by Ningsih, Rachmadi, & Hammad (2012) revealed that the rate of patient compliance does not depend on demographic data, but on the quality of the interactions and other factors. Other studies showed that the factors affecting fluid intake include education, self-concept, the knowledge of the patients, the health professionals and family involvement (Kamaluddin, 2009). The research is quantitative in nature, while the interaction of the patient and nurse is a subjective process, so it is necessary to conduct the research using a qualitative design.

Qualitative research conducted prior to the topic interaction involving the factor of nurse-patient in patients with conditions of psychiatric disorder has been executed by Cleary, Edwards, & Meehan (1999). Qualitative research on the excavation of the factors that influence the communication aspects of the nurse-patient's family was conducted by Loghmani, Borhani, & Abbaszadeh (2014). Research that provides an overview of the nurse-patient interaction factors in relation to fluid-limiting and dietary adherence in dialysis units is relatively limited and needs to be done. The aim of this study is to provide an overview of the various factors in the interaction process of nurses and patients undergoing dialysis in compliance with fluid and dietary restrictions.

MATERIALS AND METHODS

This research uses a qualitative research design with the chosen approach being an interpretive phenomenology. This is because the researcher intends to interpret the findings of the research, in this case, the activity of the nurses and dialysis patients in order to get a picture of the various factors involved in the nurse interaction process with the dialysis patients. The unit of analysis used in this study is the disclosure or exposure of internal factors in the nurse-patient interaction process. In this study, the researcher used Interpretative Phenomenological Analysis (IPA) to clarify each participant's experience in detail and to find out any psychological meanings. The researcher choose IPA as the analysis method to examine the complex and emotionally laden topics. IPA is an useful methodology for examining that such topics (Smith & Osborn, 2015). The process of analysis includes reading and re-reading, initial notes, developing emergent themes, searching for connections across the emergent themes, moving case by case and finally looking for any patterns across the cases.

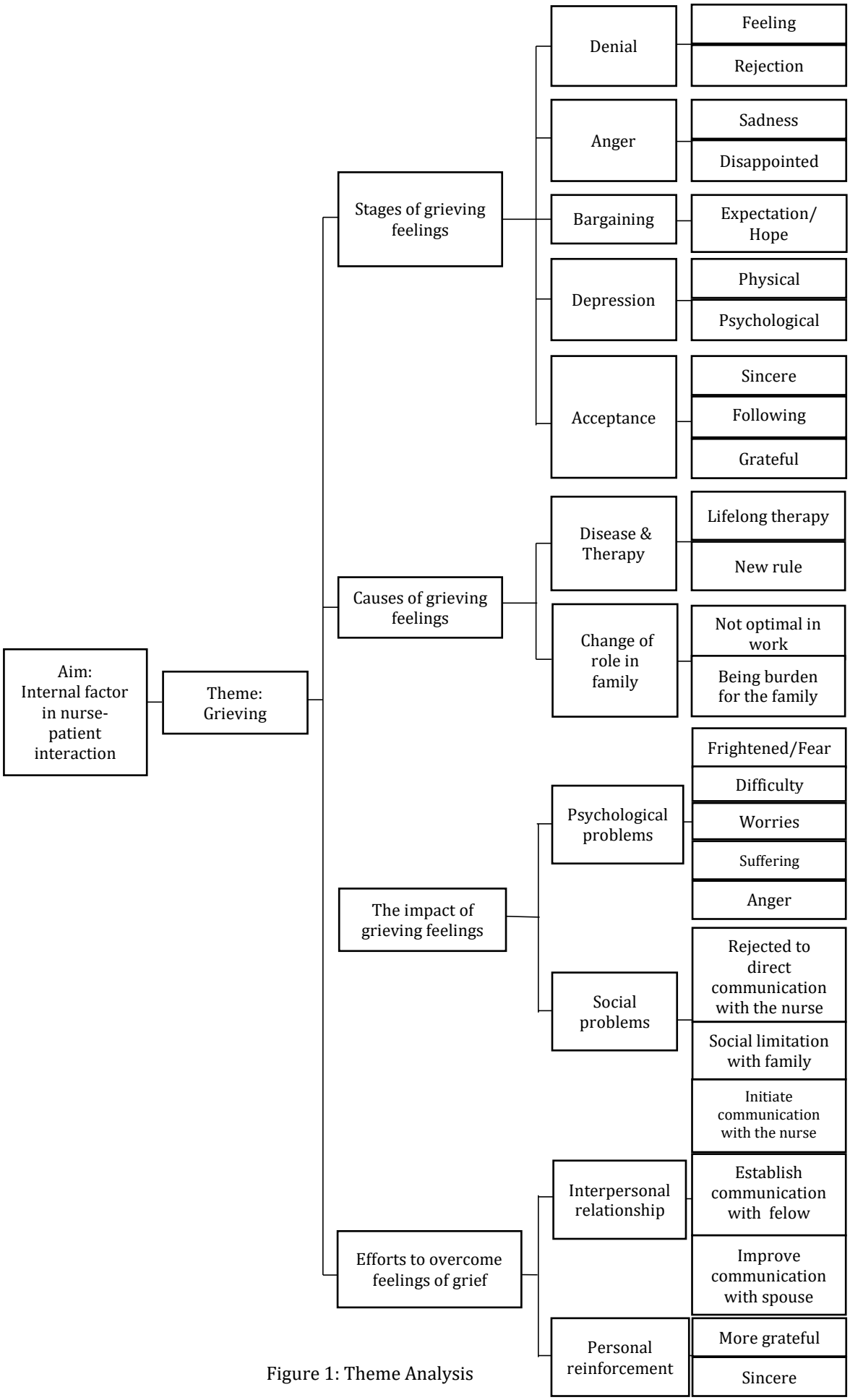

Figure 1: Theme Analysis

The inclusion criteria were that the patients had a minimum age of 18 years, were receiving similar dialysis therapy for at least 3 months, had a stable medical conditions (not currently in an acute condition requiring immediate medical treatment) and were not experiencing any psychological problems. As for the number of participants involved in the qualitative research, the method of selecting the participants in this study was not directed by quantity but based on the principle of conformity and adequacy until the number reached data saturation. The researcher reached data saturation when the information was repeated by the participants. The participants in this study included 15 patients who were selected based on the inclusion criteria and data that was saturated.

In-depth interviews complete with field notes were used in this study. The validity of the data was measured by validating the transcription of the interview results from the participants. Inter-researcher and theory triangulation were used to maintain data stability and to maintain the objectivity of the data. The aim of triangulating the data by involving fellow researchers was to enrich the findings, while the theory triangulation conducted by researchers using the theory of nurse-patient interactions from Imogene King was in order to have another perspective about what the nurse-patient interaction is. The research study was ethically approved by Medical Research Ethics Commission Faculty of Nursing Universitas Airlangga No.: 326-KEPK.

RESULTS

Characteristics of Participants

There were 15 participants involve in this study. All of the participants live in Surabaya. The gender of the participants was 7 women and 8 men. The age of the participants varied with the age of the youngest participant being 21 years old and the oldest, 63 years of age. The education level of the participants ranged from elementary school to holding a graduate degree. The type of the work that the participants did consisted of private employees, retired village officials, retired soldiers and housewives.

Theme Analysis

The mourning feeling became one of the themes that emerged as an internal factor of the nurse-patient interaction process. Feeling heartbroken was conveyed by several participants, and in this theme, there were several sub-themes, namely the stages of grieving, the causes of the grieving feelings, the impact of the grieving feelings and efforts undertaken to overcome the feelings of grief (Figure 1).

DISCUSSION

Grieving is a response of the neuropsychological experience of loss of an object or subject that has a meaning in the individual's life and is associated with the degree of suffering experienced (Bruce, 2007). The mourning feeling in this research consists of sub-themes that include the stages of grief, the cause of grief, the impact of grief and the overcoming of grief. This finding revealed a new theme in the influencing factors of the nurse-patient interactions in an effort to realise patient compliance with fluid and diet restrictions.

Other studies which focus on the factors that influence nurse-patient interactions take up the area of mental nursing as conducted by Cleary, Edwards, & Meehan (1999) and Sharac et al. (2010). The results of this study were different from the other mentioned two studies. In the research conducted by Cleary, Edwards, & Meehan (1999), patient factors lead to the increased severity of the disease, whereas in this study, it was found that the three themes in the internal factors of the patient involved was feeling sorrow, needs and norms / morals (which will be described separately). The differences that arose according to the researchers was due to several things. In this study, the researchers conducted in-depth interviews with the participants (dialysis patients) and their caregivers to gain an overview of the various things that affect the interaction of the nurse-patient within the setting of the room (a dialysis unit). In the research conducted by Cleary, Edwards, & Meehan (1999), the participants selected were nurses with patients with psychiatric disorders in a psychiatric unit setting. The research conducted by Sharac et al. (2010) was a research study that aimed to obtain a picture of the activity of the nurse-patient interaction in the psychiatry room by reviewing some of the research results.

The grief experienced by the patient has an impact on the nurse-patient interaction initiation process, which is indicated by the results of this study. The nurse-patient interaction is a fundamental aspect in the process of providing and receiving nursing care (Chatwin, 2008; Nordby, 2007; Shattell, 2004; Williams & Irurita, 2004). The expression of feelings by the patients refers to each stage of grieving, according to the theory of mourning conveyed by Kubler Ross (1969), quoted by Potter & Perry (2006). This result is consistent with the theory expressed by Bruce (2002), in that the mourning process begins at the stage of diagnosis due to changes in their experienced status which changes the trajectory of sadness to some degree.

Some of the participants said that in the initial phase of diagnosis, the participants felt like they had not been able to accept their condition, which was shown by the expression of denial, anger and depression. This study has not delved deeper into how the stages of grieving over a certain time frame, so it is not known whether the stages of grieving is an iterative process or a process that is stagnant and stops at a certain point in time. The researcher focused on the nurse-patient interaction process in the beginning (by having participants recall the

initial interaction process) to the continuous nurse-patient interaction process at the time of the meeting (which refers to the patient's continuation of their compliance with diet and fluid restrictions).

The causes of grief identified in this study include illness, action and the role change in the family. The verdict of the disease, the therapy to be followed, the suggestions to be followed and the physical changes experienced are important experiences for the participants and cause physical and psychological discomfort. The initiation of patient interaction and the interaction itself becomes fundamental to the development of the nurse-patient relationship (Stoddart et al., 2012). The nurse-patient relationship can be realised by the active involvement between individuals who both feel comfortable and in good condition or who are healthy (Hagerty & Patusky, 2003). Depression experienced by the participants and their perceptions of the impact of the disease experienced was an important response of the patients with end-stage renal disease (Kimmel, 2000, 2001), which needs to be considered by the nurses when initiating interactions with the patients.

Another cause of grief that was identified in this research was the change of role in the family. Categories that are in this sub-theme are that they are no longer optimal at work and become a burden on the family. The role change in the family became a unique finding of this study. Another study that has discussed the role-related changes in families that affects the interaction process has not been found by the researchers. It is important to realise that the stress and frustration that is felt when experiencing kidney failure as well as therapy and the rules to be followed is a real condition and it is difficult for those who experience it. For patients, this is a great crisis and it transforms a large part of their life. The patients undergo confusion and tension facing the disease, and they remain concerned about the process of the therapy or the health problems that can suddenly arise as a complication or consequence of noncompliance, even when it comes to distractions in everyday life. Kidney failure requires lifestyle changes. Routines and activities that require physical strength are more difficult for the patients to do, so their family or friends may have to take on additional responsibilities. This role change is also a burden felt by the participants of this study.

The effects of the grieving feelings that can be identified in this study include both psychological and social problems. Categories included in the psychological problems are the emergence of fear, distress, worry, and feelings of pain and anger. In patients with end-stage renal disease, those undergoing routine dialysis were upset because the disease had happened to them. There was also the fear of the possibility that they could die (for those who were not ready to face death). The patients feel helpless because they cannot do anything about the disease. This gives rise to feelings of frustration and anger against the health workers. Anger can arise due to their dependence on others (National Kidney Foundation, 2017). The participants' 6 examples convey that the initial pain and needing dialysis makes the participants feel afraid to start communicating with the nurses, their partner or their children. The six participants explained that the condition gradually began to change after the nurse continuously approached and provided an explanation of the various things brought into question by the participant and their family. This will be explained further in the internal factors (nurse) and externally, in the interaction process.

Feelings of grieving are actually a normal process, although sometimes the process can take a long time and be complicated (Bruce, 2007). In patients with chronic diseases, the feelings that arise because of the disease experienced (more predominantly, the existence of a negative perception) often causes conflict in their relationships with others (Wortman & Dunkel-Schetter, 1979). This conflict resulted in behavioural responses that inadvertently harmed the patient, including avoiding open discussion of the disease (Wortman & Dunkel-Schetter, 1979). Researchers classify this condition as a social problem, which is a behavioural response that impacts on any interpersonal relationship problems. Efforts to avoid open discussion of the disease were indicated by 9 participants who refused direct communication with the nurses, while 13 participants limited socialising with their family. Another study by Rogers (2002) also showed the same characteristics in the nurse-patient interaction, in that the patient will cooperate with the nurse when the interaction is considered beneficial and is done actively. The patient became uncooperative when the interaction was not considered beneficial for them. Thus, it should be an important concern of the nurses when interacting with patients.

Efforts to overcome the feelings of grieving shown by the participants in this study include strengthening their interpersonal relationships and personal factors. The results of this study have shown that every participant who experiences feelings of mourning (because of pain conditions, therapy and lifestyle changes) have different reactions. This is in line with the results of the research conducted by Silva et al. (2016), where the reaction to the disease and the strategies used by each individual can lead to treatment that focuses on emotion or focuses on the medical issue itself. Handling the focus on emotions in the study by Silva et al. (2016) is characterised by supporting their religion / faith, the search for family support, denial and avoidance. In this study, the treatment or remedy is indicated by communicating with fellow patients and improving communication with their partner. Both are forms of interpersonal relationship that lead to finding good support from family and their fellow patients (peers).

In the study by Silva et al. (2016), it reveals the countermeasures found by focusing on the problems that are represented by resilience as a way to give

new meaning to their experience, in order for them to realise the importance of adherence to therapy and their treatment in an effort to minimise the problem. In this study, the treatment or remedy is indicated by strengthening personal efforts where the individuals show reception prior to the problem they are facing and then look for a solution to the problem. The handling is an important factor that must be considered for health promotion and to improve the quality of life of the patients. Knowledge of countermeasures would allow the health care team to provide adequate support to prevent pessimism and despair in terms of living with the disease (da Silva et al., 2016).

CONCLUSION

Based on the research results, we were able to conclude that there are two factors that affect the nurse-patient interaction; internal factors and external factors. Feelings of mourning were one of the themes that emerged as an internal factors of the nurse-patient interaction process in the dialysis unit. Feelings of mourning in this study consisted of sub-themes, namely the stages of grieving, the cause of the feeling of mourning, grieving and feeling the impact of their efforts to overcome the feelings of grief. The results of this study are expected to be a material consideration in proper nursing care and the development of appropriate nursing interventions for each of the issues that arise in each phase experienced by the patient. This is as well as the materials for the professional development of the nurses and nursing quality improvement. The limitations of this study are based on the limitations of the supporting literature and other research results when discussing this topic in a specific area such as that of dialysis patients.

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Original Research

Predictors of Family Stress in Taking Care of Patients with Schizophrenia

Rizky Fitryasari[1], Nursalam Nursalam[2], Ah Yusuf[2], Rachmat Hargono[3] and Chong-Mei Chan[4]

[1] Doctoral Student, Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia
[2] Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia
[3] Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia
[4] Department of Nursing Science, University of Malaya, Kuala Lumpur, Malaysia

ABSTRACT

Introduction: Taking care of schizophrenia patients is challenging and causes stress for the family involved. The study was conducted to identify the predictors of family stress present when taking care of a patient with schizophrenia. The ABCX Stress Theory of Hill was used as the theoretical framework.

Methods: This study used a correlational design. The sample was 137 families who were caring for patients with schizophrenia at the Menur Mental Hospital, Surabaya, Indonesia. The sample was obtained by way of purposive sampling. The data was collected by a questionnaire and analysed by multiple regression to determine the relationship of the family's structure, family knowledge, the burden of care, stigma, social support, the patient's illness duration, the patient's frequency of relapse and the patient's severity level with family stress.

Results: The results showed that the family's stress was predicted by the family's structure (p=0.029), stigma (p=0.000), the burden of care (p=0.000), and the patient's frequency of relapse (p=0.005). The burden of care was the strongest predictor of family stress (Beta= 0.619).

Conclusion: The patient's frequency of relapse and stigma were other kinds of family stressor. The stressors stimulated a negative perception, called the care burden. Limited adequacy of the family structure-function will inhibit the family in using other resources, creating family stress. Nurses may develop an assessment format that consists of the family stress predictors in order to create a nursing care plan specific to reframing the techniques of family stress management.

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CONTACT

Rizky Fitryasari
risqiv@yahoo.com.sg
Faculty of Public Health, Universitas Airlangga, Surabaya, Indonesia

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INTRODUCTION

Schizophrenia is a chronic mental disorder and is a cause of morbidity. Schizophrenia is a persistent and serious brain disease that results in psychotic behaviour, concrete thinking difficulties, an inability to communicate, abnormal affection and difficulties in solving problems and meeting daily needs (Levine & Levine, 2009; G. Stuart & Sundeen, 2012). The prevalence of severe mental illness, including schizophrenia, according to Riskesdas (Kemenkes RI, 2013) is 1.7 per 1000 inhabitants, meaning more than 400,000 people suffer from severe mental disorders in Indonesia. The incidence percentage of schizophrenia in East Java was 0.22%, while in Surabaya, it was was 0.2%. The incidence rate of schizophrenia is difficult to decrease due to the high recurrence rates. Based on a preliminary study at the Menur Soul Hospital of Surabaya conducted February-April 2016, the number of inpatients reached 5,925 patients, where 90% had schizophrenia. The data showed that 80% of patients with schizophrenia had been treated in previous psychiatric care or had a relapse (Medical Record RSJ Menur, 2016).

Schizophrenia, not only cause suffering for the patients, but also for the people who are closest to the patient as well. Usually, the family is the most affected by the mental disorder. In the interviews with 10 families of patients during the preliminary study at Menur Hospital, 100% stated that the family experienced high tension during the treatment of the schizophrenic patients at home. The families feel anxious, sad, depressed and angry when faced with

uncontrollable patient behavior. The families also complained about being physically exhausted by having to keep up with the patient at all times. Additionally, 4 out of 10 families complained of frequent headaches, hypertension, and gastritis after more than 2 years of treating patients with schizophrenia. The families felt like there was a lack of time to do activities because they must always keep with the patients with schizophrenia every day. The situation experienced by families over a long period of time can cause the family to experience stress and anxiety (Biegel, 1995; Stuart & Sundeen, 2005). Suhita's (2015) study of 87 family members acting as the main caregiver in East Java's Kediri City stated that 75% had moderate to severe stress.

With the presence of schizophrenia patients being a stressor in the family system, 67.8% of them feel pressure (Darwin, Hadisukanto, & Elvira, 2013). Families, as the main caregiver, are susceptible to psychological problems, fostering family conflict and mutual abuse. 76.7% of families show negative symptoms, including depression and influencing family behavior when treating patients at home. The family often induces irritation due to their inability to cope with the burden. This is done by blaming the patient and disregarding the patient's condition (Brillianita & Munawir, 2014; Pharoah, Mari, Rathbone, & Wong, 2010).

Stress experienced by the family is caused by the high burden of care, including feeling worried about the patient's condition related to their health status, future, financial condition, and the fulfillment of their daily needs. The financial condition of the family experienced problems during the treatment of a 12-month schizophrenia patient, as a result of financing the treatment, the fulfillment of the patient's needs, hospital transportation and accommodation costs (Djatmiko, 2007; Ennis & Bunting, 2013; Hadryś, Adamowski, & Kiejna, 2011). The presence of schizophrenia patients makes the family face social stigma. Related to the stigma attached to both the patients and their families, 37.5% of the families had a negative perception of the illness suffered by the patients with schizophrenia. The families are embarrassed and often excluded from community activities involving all family members. The magnitude of the burden, the strength of the stigma both from the family and society, the lack of support for the family and the fluctuating condition of the patients may cause family stress. There are many obstacles faced by the family when taking care and living together with the schizophrenic patient. The lack of knowledge about schizophrenia, the social stigma and social alienation, the cost of treatment, the decrease of the families' health, anxiety, depression, and other things are a series of social problems encountered in the family with the schizophrenic patient (El Tantawy, Raya, & Zaki, 2010; Suhita et al., 2015). An insurmountable family stress situation creates an unfavorable environment and causes the schizophrenia patients to relapse. The inability of the family to control the emotions and the existence of a stressful family life causes issues and continuous criticism is a cause of patient relapse (Akbar, 2008; Amaresha & Venkatasubramanian, 2012; Fadli & Mitra, 2013).

ABCX Hill's Theory, stated by Rice (1987), is the theory that was used in this research study. The theory explains if the families facing uncomfortable situations represented by the letter A, they will make an adaptation effort by utilising social support and personal strengths of the family which are described as letter B. Letter C explains the family's perception during a stressful event, which includes how the family defines the uncomfortable events in their life. The letter X represents the degree of crisis experienced by the family as a result of the interactions between letters A, B, and C. Based on this model, families who care for schizophrenic patient have limited resources and have a negative view of the situation. They will experience a crisis or more severe stress than other families who are faced with the same pressing event who are better adapted.

The researcher, as a mental health nurse, tried to combine Hill's theory with the assessment stage of Family-Centered Nursing theory (Friedman, 2003). Family-Centered Nursing is a family theory with a nursing care approach. An important step in this theory is the nurse's ability to conduct a family situation assessment, which includes assessing the family and patient factors. The family factors are the strength of the family structure, their economic capacity and the level of family knowledge about schizophrenia. The patient factors are the frequency of relapse, the duration of illness and the illness severity. Based on Hill's theory, Family-Centered Nursing theory (Friedman, 2003) and some of the studies discussed above, the burden of care, stigma and social support for families has the potential to affect the stress experienced by the involved families. This study aims to analyze the influence of family structure, economic ability, knowledge level, the burden of care, stigma, social support, the frequency of relapse, the duration of the illness and the patient's severity level as the predictors of family stress. The results of the study are expected to contribute to nursing science in determining the stress's predictors on the families who care for patients with schizophrenia.

MATERIALS AND METHODS

Research Design

This study used a correlation research design that explained the relationship of the factors causing family stress when treating patients with schizophrenia. The study was conducted from June through to September 2017. The study involved 137 family members as respondents, who were obtained by purposive sampling. The inclusion criteria were the families being the primary caregivers of the patients, the patient being more than 20 years old

and them living in one house with the patient for at least one year. The patient should have been diagnosed with schizophrenia for at least three years (proven by medical records), and have already experienced at least one recurrence. The dependent variable was family stress, while the independent variables included family structure, knowledge level, care burden, stigma, social support, the patient's duration of illness, the frequency of relapse and severity.

Instruments

The data was obtained through of a questionnaire. The demographic data was assessed using a single item: age. Economic status was measured using a closed questionnaire with questions about the average family's fixed income in a month. The family's structural variables were adapted from the family assessment questionnaire as according to Friedman (2003). The respondents were asked what is their role was when related to the patient (mother, father, spouse, child or other family member).

Family knowledge about schizophrenia was measured using a questionnaire modified from McCubbin & Thompson (1991). Ten-item questions assessed the family knowledge related to the definition of illness, the effect on the family and the schizophrenia treatment. Each item was rated on a scale of 1 (strongly disagree) to 5 (strongly agree). The items were summed, with the higher scores indicating higher knowledge.

The burden of care variable instrument was prepared based on the Caregiver Strain Index questionnaire (Thornton & Travis, 2003) and the concept of burden according to the World Health Organization (2008) modified according to the condition of the family who cared for the schizophrenia patient. The instrument consisted of eight-item statements on subjective and objective burden measured using a Likert-scale ranging from 1 (never) to 5 (always). The stigma instrument was developed based on the stigma's dimension (Goffman, 1963) and the definition of stigma (Link & Phelan, 2001). The instrument consisted of ten-item statements asking about labelling, stereotyping, separation and discrimination. They were measured on a five-point scale (1: strongly disagree to 5: strongly agree). The social support variable was obtained by way of a modified instrument of the Social Support Index (H. I. McCubbin, Paterson, & Glynn, 1987). The instrument consisted of ten-item statements focused on emotional, informational, instrumental and award support. Frequency was measured on a five-point scale (1: never to 5: always).

The data from the patients was collected related to their illness history. The patient's duration of illness was explained as the first time that the symptoms of schizophrenia appeared up to the current date, expressed in years. The frequency of relapse referred to the number of recurrences and hospitalisations within a year. The severity of illness was measured using the modified Brief Psychiatry Rating Scale (BPRS) (Overall & Gorham, 1988) 1988). The questionnaire consisted of 18-item statements filled in by a doctor or nurse in charge, assessing the positive, negative and affective symptoms performed by the patient. Each item was rated on a scale of 1 (no symptoms) to 4 (severe). All items were added together, while ahigher score indicated higher severity symptoms.

The family stress variable was measured using a modified questionnaire using the Symptom Rating Test (Kellner & Sheffield, 1973). The questionnaire consisted of a ten-item statement on the psychological and physical symptoms felt by the family over the last three months, rated in 5-point of scale ranging from 1 (never) to 5 (always). All items are totalled, with a higher score indicating a higher severity of family stress. All of the instruments had been already tested for validity and reliability, in a pilot study consisting of 25 respondents. Each item in the statements reached validity ($r>0.514$) and each questionnaire reached reliability as well (>0.8).

Data Analysis

Descriptive analysis was used for the respondents' characteristic and for the variable description (Table 1 and 2). We used multiple regression analysis to identify the predictors of family stress during the treatment of patients. We created a p-value table between the independent variables and the dependent variable (Table 3). Based on this table, we removed economic status, family knowledge and social support from the regression model because these three independent variables have a p-value <0.25. Further testing was performed to determine which variables are valid for being a family stress predictor. A regression test was done until all of the variables had a value< 0.05. Valid variables that can be used as a predictor of family stress are family structure, maintenance burden, stigma and the frequency of relapse. The four variables have been able to prove the existential assumptions (mean: 0.000, SD: 5.824), interdependence assumptions (Durbin Watson: 1.913), linearity assumptions ($p = 0.000$), homoscedasticity (norms of data spreads along or zero) data (normal distributed data and on PP Residual Plot of data spread around the diagonal line) and the multi-collateral assessment (VIF <10). The four independent variables were used in simultaneous regression analyses. The level of statistical significance was set at $p <0.05$.

Ethical clearance

The respondents were families who accompanied patients to the outpatient unit of the Mental Hospital of Menur. The participants were recruited on the basis of ethical principles. The participants involved in the study had previously received a written explanation of the purpose of the research, and the procedures, rights and obligations, benefits and

disadvantages involved in the study. Only the participants who had been given informed consent were involved in the study. This study was given ethical approval from the Ethical Committee of Menur Mental Hospital, number 423.4 / 72/305/2017.

RESULTS

Characteristics of the respondent

The characteristics of respondents have been presented in Table 1. The majority of respondents were between the ages of 46 to 65 years old. A lot of them were the mother of a patient with schizophrenia. The others were made up of their siblings, relatives, children, spouse and father. Almost half of the monthly family income was more than 4.000.000 IDR. Most of the patients had been diagnosed with schizophrenia for more than ten years and almost half of them were experience relapse one to three times each year.

Variables description

The variables' description has been explained in Table 2. The average of family knowledge was 37.93 (SD= 3.843). The family-felt burden of care average was 23.39 (SD=7.792). The family also experienced stigma from the environment, which averaged 25.09 (SD= 6.358). The family receiving social support had an average of 31.10 (SD= 5.721). Schizophrenia patients had a level of severity of 28.11 (SD 6.954). The overall family experiencing stress had an average of 27.08 (SD=10.524)

Variables' correlation

Pearson's correlation was computed between the family's stress and all of the research variables (table 2). The result of testing on the nine research variables showed that there was a strong relationship between burden of care (r = 0.804; p = 0.00) and stigma (r = 0.677; p = 0.00) on family stress. Subsequently, there was a weak correlation between the patient's duration of illness (r = 0.193, p = 0.024), the patient's frequency of relapse (r = 0.392, p = 0.00) and the level of severity (r = 0.267, p = 0.002) with family stress. The variables of economic status, family structure, knowledge and social support are not related to family stress during the care of patients with schizophrenia.

Predictors of family stress

As shown in Table 4, the higher the burden of care (p = 0.000; Beta = 0.619), the more frequent the patient's frequency of relapse (p = 0.005; Beta = 0.145), the higher the perceived family stigma (p = 0.000; Beta = 0.194) and the lower functioning of the family structure (p = 0.029; Beta = -0.106). The aforementioned will increase stress in the family. All of the independent variables may explain the variation of family stress as 69.4% (R2=0.694). The variable that has the greatest role as a predictor of family stress is the burden of care (Beta = 0.619).

Table 1. Characteristics of the respondents

Variable	Frequency	Percentage
Age (years)		
26-35 years old	19	13,9
36-45 years old	20	14,6
46-55 years old	34	24,8
56-65 years old	43	31,4
>65 years old	21	15,3
Family's structure		
Father	11	8.0
Mother	41	29.9
Spouse	13	9.5
Child	18	13.1
Siblings	30	21.9
Relatives	24	17.5
Family monthly income		
<3.500.000 IDR	54	39.4
3.500.000 – 4.000.000 IDR	20	14.6
> 4.000.000 IDR	63	46.0
Patient's duration of illness (years)		
3 years	16	11.7
>3-5 years	18	13.1
>5-10 years	31	22.6
>10 years	72	52.6
Patient's frequency of relapse (times)		
1-3 X	63	46.0
>3-5 X	41	29.9
>5 X	33	24.1

Table 2. Variables' description

Variable		Mean	SD
Dependent	Knowledge	37.93	3.843
	Burden Care	23.39	7.792
	Stigma	25.09	6.358
	Social Support	31.10	5.721
	Level of severity	28.11	6.954
Independent	Family Stress	27,08	10,524

DISCUSSION

Stress experienced by the family in assisting and treating patients with schizophrenia can be predicted using the variables burden of care, stigma from the environment, the patient's frequency of relapse and the functioning within the family structure. The results of this study are in line with family stress according to Hill (Rice, 1987), which mentions that family stress is caused by the interaction between stressors, family perception, and the resources owned by the family. The patient's frequency of relapse and the stigma from the environment is a stressor for the family. Stressors cause a negative perception for the families in the form of care burden. A lack of adequate functioning in the structure of the family means that the family cannot utilise the resources they own, so then the

Table 3 Inter-correlation of the variables

	Family structure	Knowledge	Burden of care	Stigma	Social Support	Patient's duration of illness	Patient's frequency of relapse	Level of severity	Family's stress
Monthly family income	0.311**	0.481**	0.085	0.125	0.163	0.208*	0.098	-0.107	-0.093
Family structure		0.492**	0.046	0.010	0.132	0.195*	0.016	0.038	-0.074
Knowledge			-0.072	-0.102	0.291**	0.070	-0.019	-0.134	-0.159
Burden of care				0.731**	0.027	0.173*	0.330**	0.189*	0.804**
Stigma					-0.093	0.072	0.221**	0.234**	0.677**
Social Support						0.086	0.027	0-.037	-0.027
Patient's duration of illness							0.507**	0.174*	0.193*
Patient's frequency of relapse								0.603**	0.391**
Level of severity									0.267**

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4. Regression of the family's stress on family structure, care burden, stigma and patient's recurrence

Independent Variables	Dependent Variable: Family stress	
	Beta	p-value
Family structure	-0.106	0.029
Burden of care	0.619	0.000
Stigma	0.194	0.007
Patient's frequency of relapse	0.145	0.005
R2=0.694;Adjusted R2 =0 .684 ; (p= 0.000)		

families experience stress when caring for patients with schizophrenia.

The stressors perceived by the family comes from within the family, namely the patient's frequency of relapse. The other stressors come from outside the family, including stigma. The findings of the study showed that out of all of the family members with schizophrenia, 46 % experienced a relapse at least one to three times and the others, more than three times. If repeated relapse continues in patients with schizophrenia, it can have negative consequences for the caregivers (Rexha, Jose, Golay, & Favrod, 2006). Recurrent schizophrenic patients exhibit uncontrollable behavior, such as being angry without cause, and suspicious excessive and unnatural behavior. The behavior is often exhibited not only at home, but also within the environment, which causes unrest in the community. An unpleasant response from the environment related to the patient's behavior is the stigma towards patients with schizophrenia and their families (Ariananda, 2015).

Stigma becomes a stressor for the families. Stigma is the assessment of a situation or object that is considered to be a bad thing, so their value is lower than that of a normal person. This assumption causes the family to experience discrimination and thus to lose the opportunity to engage in activities that are important in life. Stigma keeps the family impeded from the activities of daily life (Goffman, 1963 in Heatherton, 2003). The dominant stigma felt by families in this research study were discrimination and separation. The local community treats the family differently, with them being disallowed from participating in community activities involving all of the family members. Community concerns about the uncontrollable behavior of schizophrenia patients cause people to distance themselves from the patients and their families during joint activities. Neighbours who live near the family also rarely visit and avoid communicating with the patients. The results of this study are in accordance with the research of Ariananda (2015), which conveyed that the community avoids interactions involving the presence of patients and their families. Stigma causes the family to have negative perceptions, affects their emotions and causes stress (Raguram, Raghu, Vounatsu, & Weiss, 2004; Singh, Matto, & Grover, 2016). The high amount of stigma and the patient's frequency of relapse are stressors for the family, and affect the family's perspective of caring for schizophrenic patients at home.

The stress experienced by the family is influenced by the family's perception of the perceived stressors. The results showed that the families, in treating patients with schizophrenia, felt various forms of care burden. The perceived burden is the result of the perceptions regarding the presence of the schizophrenia patients and high stigma from the community. Treatment burden occurs as a result of the family interaction process with the sick family member in order to provide treatment. The burden

felt is both subjective and objective (Chou, Fu, & Lin, 2011). The treatment and care of schizophrenic patients takes a long time. The family, as the closest environment, should be able to accept the fact that sick family members should be helped to achieve better conditions for the patient. In line with the opinion of Chou (2011), this explains that the caregiver's perception of an objective burden is influenced by a number of care needs that must be met by the caregiver. The state of the schizophrenia patient is less independent and has many needs that must be fulfilled, both in relation to the needs of treatment and daily needs. This situation requires the family to provide time, energy, thought and funds. This situation creates an inconvenience for other family members. Families limit the time they have to work and interact with the social environment because they have to treat the patients with schizophrenia. Several studies have concluded that the suffering experienced by schizophrenia patients also interferes with the caregiver's comfort because they feel burdened by the regular and continuous care (Fitrikasari, Kadarman, & Woroasih, 2012; Maldonado, Urizar, & Kavanagh, 2005; Ochoa et al., 2008). The prolonged course of the disease, uncertain patient behaviour and family incompetence to care for the disease causes discomfort and affect the family's perspective. This study proves that the burden of patient care in relation to schizophrenia one of the predictors of family stress. The burden felt by the family is perceived negatively by the family as it is an uncomfortable situation and poses a threat to the stability of family life. Negative perceptions that continue to grow and that are not managed properly will cause the family to fall into a stressful situation.

The process of stress in the family is also influenced by the resources owned by the family. The results showed that one family resource, namely the family structure, has a role in reducing family stress. The family structure is the strength that is owned by the family to arrange their values, communication patterns and family role as a lifestyle so then the family is able to perform its function properly (Friedman, 2003). The dominant family structure in this study was the role of the mother as the primary caregiver of the schizophrenia patients (29.9%), followed by sibling and child. The situation is influenced by the cultural structure of Indonesia that still holds true to strong family ties, so if there is one family member who is sick, then the nuclear family will take on the caregiver role to provide care. Parents or children as part of the nuclear family is a family structure that plays an important role in providing long-term care to family members who experience chronic disease, such as mental disorders (Karp, 2001; Sapin, Widmer, & Iglesias, 2016).

This situation is also in line with the research conducted in India, in that the core family in Asian families is strong enough that the family members consider caregiving as their moral obligation (Kate, Grover, Kulhara, & Nehra, 2012). Families have a tendency to regulate their family structure when they know that one member of their family is experiencing schizophrenia. Mothers who act as the household manager will have a greater parenting role compared to the fathers, who have to work for a living. Similarly, siblings, only when the family has no parents, become the managers of the household and will therefore be selected as the primary caregivers for the familial schizophrenia patient. Effective role sharing will help the families accept reality more quickly so as to reduce the stress experienced. An important role in the family when caring for a sick family member involves the process of making the decision to seek immediate solutions and to begin the treatment process (Carpentier, 2013; Sapin et al., 2016). However, it is possible for there to be a conflict within the family due to an imbalance of role sharing within the family structure (Sapin et al., 2016; Widmer, 2010). The primary caregiver feels a heavier burden than the other family members who do not accompany the patient. Therefore, the family needs resources from outside of the family, such as social support from the environment. The social support received by families is a positive indicator of the family burden during the care of patients with schizophrenia (Chow, 2013 in Poegoeh & Hamidah, 2016). The results of this study found that social support is not a predictor of family stress. According to Widmer (2010) and Sapin (2013), social support sourced from the environment (community and extended family) is very effective and necessary for the families caring for schizophrenia patients early in their treatment that does not impact on long-term care. Sadath (2017) explained that social support is not one of the factors that determines the emotional expression of families that have been predicted to experience family stress. This is because families have limited access to social support while caring for patients. Families who treat patients with schizophrenia tend to limit themselves in order to take advantage of the social support provided by the surrounding environment. The family assumes that the existence of the patient is a disgrace to the family (Hawari, 2009), so the family feels that they do not want to tell anyone about the illness. In addition to these assumptions, families who have tried to ask for support from neighbours and their extended families, do not feel the benefit, so the family feels isolated and discriminated against by the environment. As a result of resource utilisation in reducing stress, families choose to optimise the family structure when caring for schizophrenic patients and do not use social support from the environment.

Research implications

The research findings reinforce the ABCX theory according to Hill (Rice, 1987). The frequency of patient relapse and the stigma experienced by the family were stressors. The presence of stressors is interpreted by the family as a burden of care.

Families try to optimise the family's strength, called family structure, as a resource for managing stressors, but if the family may think that if the stressors are threatening to the family stability, then this may result in a family burden. This situation brings families into stressful situations. Nurses, as health professionals who are willing to interact directly with the family, can develop family nursing interventions, especially in relation to stress management. Nurses can do stimulations that helps the families to modify the family perceptions of the stressor, which was originally considered to be a challenge in treating patients with schizophrenia.

The findings of the study have proven that the patient's frequency of relapse, stigma, the burden of care, and family structure can predict the stress experienced by the families during the care of schizophrenic patients. Based on the theory of family centre and nursing (Friedman, 2003), the results of this study have implications for nurses. This is as they seek to conduct a family assessment which pays attention to the patient factors, especially the frequency of patient relapse. The nurses also must be attentive to the family factors, namely family structure and the family perceptions related to burden and stigma. The nurses should be able to identify the patient's relapse frequency, family structure, the burden of care and stigma as the family's stress indicators, so they can help the family to manage stress.

Research limitation

This research has several limitations. The sample of the study was obtained from the families who accompany the patients to the outpatient unit. The perception of stress experienced by the family was strongly influenced by the situation and the acute condition of the patient at that time. This caused less access to the social support that was used. Another limitation is that the results of this study has a limited potential for generalisation, especially for the family's stress when the patients are hospitalised.

CONCLUSION

The stress experienced by the family when taking care of patients with schizophrenia is determined by the family's perception of the stressor. Family stress can be predicted based on the patient frequency of relapse, the stigma felt by the family, the large burden of care and the family structure, which may not function optimally. Nurses as health care providers can develop an assessment format that focuses on the family stress predictors, helping them to develop family stress management that focuses on establishing positive perceptions and enhancing the functioning of the family structures, enabling them to manage the burden of care and stigma experienced.

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Original Research

Differences Between NRS-2002 and MUST in Relation to the Metabolic Condition of Trauma Patients

Oktaffrastya Widhamurti Septafani[1], Suharto Suharto[2] and Harmayetty Harmayetty[1]

[1] Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia
[2] Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Introduction: Flow phase with high cardiac output and increased metabolic conditions. When metabolic conditions are not stable there will be a long duration of complications until death. One of the benefits of Nutrition Risk Screening (NRS-2002) is reliable inpatient care for critical patients. While the Malnutrition Universal Screening Tool (MUST) shows speed in the classification of nutritional disorders.

Methods: This study used the observational design method. The sampling technique in this study used Consecutive sampling in accordance with the criteria consisting of 31 respondents. This was to determine the specificity and sensitivity values of NRS 2002 and MUST using contingency table analysis and for the Area Under Curve (AUC) using Receiver Operating Characteristic (ROC) curve analysis.

Results: The sensitivity values in MUST was predicted for metabolic conditions which was higher than when using NRS 2002, but the specificity and value of AUC (Area Under Curve) was higher using NRS 2002 than using MUST when it came to predicting metabolic conditions.

Conclusions: There were differences in effectiveness between use of Nutritional Risk Screening (NRS-2002) with the Malnutrition Universal Screening Tool (MUST) in relation to changes in metabolic conditions of trauma patients. NRS-2002 is more effective than MUST. NRS 2002 has the ability to identify patients more precisely who are likely to have a negative outcome.

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CONTACT

Oktaffrastya Widhamurti Septafani
✉oktaffrastyaws@gmail.com
Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

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INTRODUCTION

Trauma is the most common cause of death in the productive age group of 16-44 years old worldwide (MacLeod, 2005). The metabolic response to human trauma has been defined as having 3 stages: ebb phase or decreased metabolic rate in the early shock phase, flow phase or catabolic phase, and the anabolic phase. The ebb phase begins immediately after the injury or trauma and lasts for 0-48 hours. The ebb phase is characterised by tissue hypo-perfusion and decreased overall metabolic activity. The flow phase, which includes a catabolic phase characterized by high cardiac output and increased metabolic conditions. Typically, the peak flow phase is about 3-5 days, and this will drop in 7-10 days. Late death is when the patient dies several days or weeks after the trauma. The prevalence of trauma deaths occurring in this period is 10% -20% (Sobrino & Shafi, 2013). Increased metabolic conditions include the hyper-dynamic characteristics of heart rate, increased energy expenditures, increased solubility of glycogen and protein, and a loss of muscle mass and weight, leading to delayed wound healing and immune system depression (Lee, Benjamin & Herndon, 2005). If the metabolic condition is not handled properly then it will lead to a longer period of treatment, complications and death. So far predicting metabolic condition is based on laboratory results by looking at the magnitude of plasma proteins, nitrogen balance and the result of immunological function tests. However, there are often errors in the pre-analytic stages of laboratory examination when it comes to initial preparation compared to errors in the analytical phase (Plebani, 2012). As a result there are still some specimens received by the laboratory experiencing hemolysis, so it cannot be checked according to clinical request.

In a study conducted by Chen et al., the sensitivity (94.5%) of Nutritional Risk Screening (NRS-2002) was high when it came to identifying nutritional disorders compared to Routine Clinical Laboratory Measurements (RCLMs) (Chen et al., 2015). For nutrition risk screening in adult patients, the European Society for Clinical Nutrition and Metabolism currently recommend Nutritional Risk Screening (NRS-2002) as the screening tool of choice (Kuppinger et al., 2013). NRS-2002 showed superior performance (higher sensitivity and specificity for predicting complications) compared to other screening tools such as the Malnutrition Universal Screening Tool (MUST). The study comparing MUST with NRS 2002 showed that MUST is significantly associated with complications in postoperative patients. with a sensitivity value of 23.1% and a specificity of 86.8% (Lomivorotov et al., 2013).

The results of nutritional screening can determine the patient's status and detect some of the complications of critical illness (Al Kalaldeh & Shahin, 2014). Based on the recommendation of the British Association of Parenteral and Enteral Nutrition (BAPEN), simple and easy nutrition observation devices can be used to demonstrate the risks of nutritional problems in patients requiring comprehensive advanced examination. Every nutritional screening device should have the property of being easy and fast to use and interpret, be valid and have a good level of acceptance so each patient can subsequently receive a nutrition care pattern that is appropriate to their condition (Weekes, Elia, & Emery, 2004). Currently, many nutrition observation devices in hospitals have been developed for various purposes, such as to adjust the measured population, or to find new methods that are faster and easier to use. One of the recommendations of the European Society for Parenteral and Enteral Nutrition (ESPEN) is Nutrition Risk Screening (NRS-2002) which assesses patients based on two components, malnutrition and the severity of disease with no category, mild, moderate, and severe being in the result categories respectively. The NRS-2002 device is also known to be valid and easy to use in European trial populations (Kondrup, et al., 2003). In some studies, it showed Nutrition Risk Screening (NRS-2002) has a high specificity and sensitivity value compared to other nutritional screening values.

BAPEN developed the Malnutrition Universal Screening Tools (MUST) that performs an examination with 3 main criteria: current weight, a large amount of unwanted weight loss, and the presence of acute illness. The score each criterion is between 0, 1, or 2. Based on the MUST assessment, patients are classified as low, moderate, and high risk (Malnutrition Advisory Group, 2003). In Jayawardena et al.'s study (2016), there is a Malnutrition Universal Screening Tools (MUST) relationship to the patient's clinical situation. The study demonstrated the high specificity of Malnutrition Universal Screening Tools (MUST) in predicting outcome value of patients with heart failure.

The purpose of this study was to explain the difference in effectiveness between the uses of Nutritional Risk Screening Instruments (NRS-2002) with the Malnutrition Universal Screening Tool (MUST) in relation to changes in metabolic conditions in trauma patients.

MATERIALS AND METHODS

The Committee of Ethical Approval in the Faculty of Nursing Universitas Airlangga has carefully reviewed the research proposal presented and approved this research study by way the full board method. This study used an observational design. Observational studies are an alternative to experimental studies. An observational study is sometimes termed a natural experiment. The study subjects were classified into groups with the presence or absence of a disease respectively, which is called a case-control study. In this design, an observation or posttest measurement was performed. Diagnostic analysis by examination of albumin and hemoglobin were gold standard. The population in this study was made up of all trauma patients who were treated at Petrokimia Gresik Hospital. The patients who became part of sample must have meet the inclusion criterion. The establishment of the inclusion is criteria as follows: (1) Treatment of trauma > 2 days (in flow phase). (2) Patients who are trauma by serious trauma. Severe trauma based on AIS (Abbreviated Injury Scale). The while the exclusion criteria that the researchers set include (1) Patients with hyperthyroid disease; (2) Patients with heart failure; (3) Hypertensive patients on beta-blocker therapy; (4) The patient is pregnant; (5) Patients with diabetes and (6) Patients with impaired renal function. The independent variables were the Nutritional Risk Screening (NRS-2002) and the Malnutrition Universal Screening Tool (MUST). Dependent variable was metabolic condition measured by blood urea and blood sugar. Gold Standard nutritional status was measured by the albumin and hemoglobin blood levels of the trauma patients. Each respondent recorded the results of the blood urea examination, blood sugar and the examination of albumin and hemoglobin was done as standard by seeing the patient's medical record. If there was no data in their medical record, then a blood test was done.

According to Leuenberger (2010), NRS 2002 devices have been accepted and widely used in Europe. The device uses four pre-screening statements to separate patients at lower risk of malnutrition from those with a higher risk. This include forms of disease severity, making this device capable of covering patients in all categories of illness in hospitals. NRS 2002 is a device that is easy to use and fast (its use takes only 2-3 minutes). Based on screening conducted with this method, the patients are classified in the normal category (score

= 0), mild category (score = 1), moderate category (score = 2), or weight category (score = 3).

There are 5 step to perform when screening using MUST, i.e. [1] the collection of anthropometric data collection such as height, weight, and BMI, [2] the scoring of malnutrition risk based on undesirable weight loss, [3] if there is an acute illness which affects the risk of malnutrition, and then the score plus 2, [4] the summation of the scores based on measurements, where the score 0 = low risk, score 1 = medium risk, or score ≥2 high risk malnutrition, and [5] is the last step where planning measures are undertaken thet are appropriate to the patient's malnutrition risks.

To determine the specificity and sensitivity of Nutritional Risk Screening (NRS-2002) and the Malnutrition Universal Screening Tool (MUST) in relation to metabolic conditions (the values of urea and blood sugar levels) and standard nutritional status (albumin and hemoglobin values) using contingency table analysis, and for the Area Under Curve (AUC) using Receiver Operating Characteristic (ROC) curve analysis.

RESULTS

Based on the analysis of Table 1, it was found that the sensitivity value of NRS - 2002 in relation to the risk of malnutrition seen in the results of laboratory test was 62.5%. NRS-2002 has the ability to screen trauma patients who are at risk of malnutrition which was 62.5%. The specificity value of NRS - 2002 against the risk of malnutrition as seen from the laboratory results was 100%. NRS-2002 has the ability to detect negative results in trauma patients, so the ability of NRS-2002 to screen trauma patients with absolutely no risk of malnutrition was 100%. Positive predictive value a / (a + b) × 100 = 5 / (5 +0) × 100 = 100%. This indicates that the true proportion of trauma patients included in the category of malnutrition risk was 100%. The negative predictive value d/(c + d) × 100 = 17 / (3 +17) × 100 = 85%. This indicates that the proportion of trauma patients who are not actually included in the malnutrition risk category was 85%.

Based on the analysis of Table 2 it was found that the MUST sensitivity value in relation to the risk malnutrition risk seen laboratory result was 75%. MUST has the ability to screen trauma patients who are at risk of malnutrition standing at 75%. MUST specificity value against malnutrition risk seen from laboratory result was 64.7%. MUST has the ability to detect negative outcomes in trauma patients, so the ability of MUST to screen trauma patients with absolutely no risk of malnutrition was 64.7%. Positive predictive value a / (a + b) × 100 = 6 / (6 + 6) × 100 = 50%. This suggests that the true proportion of trauma patients included in the category of malnutrition risk was 50%. The negative predictive value d/(c + d) × 100 = 11 / (2 + 11) × 100 = 84%. This indicates that the true proportion of

Table 1. The results of the test validity (specificity and sensitivity) in relation to the use of Nutritional Risk Screening (NRS-2002) used to calculate the risk of malnutrition as seen from the laboratory test (albumin and hemoglobin)

NRS 2002	Malnutrition risk (Low albumin and hemoglobin levels)	Normal (Normal albumin and hemoglobin levels)
	n	n
Malnutrition risk	5	0
Normal	3	17
	Se = 62,5 %	Sp = 100 %

Table 2. The results of the test validity (specificity and sensitivity) on the use of the Malnutritional Universal Screening Tool (MUST) used to calculate the risk of malnutrition as seen from the laboratory test (albumin and hemoglobin)

MUST	Malnutrition risk (low albumin and hemoglobin levels)	Normal (normal albumin and hemoglobin levels)
	n	N
Malnutrition risk	6	6
Normal	2	11
	Se = 75%	Sp = 4.7 %

Table 3. The result of the test validity (specificity and sensitivity) on the use of Nutritional Risk Screening (NRS-2002) in relation to metabolic response as seen from laboratory test (BUN and blood glucose)

NRS 2002	Metabolic response (High BUN and blood glucose levels	Normal (Normal BUN and blood glucose levels)
	n	N
Malnutrition risk	4	0
Normal	11	7
	Se = 26.7%	Sp = 100 %

Table 4. The results of the test validity (specificity and sensitivity) on the use of the Malnutritional Universal Screening Tool (MUST) in relation to metabolic response as seen from laboratory test (BUN and blood glucose)

NRS 2002	Metabolic response (High BUN and blood glucose levels	Normal (Normal BUN and blood glucose levels)
	n	n
Malnutrition risk	7	3
Normal	8	4
	Se = 46.6%	Sp = 57.1 %

trauma patients not included in the malnutrition risk category was at 84%.

Based on the analysis of Table 3, it was found that the sensitivity value of NRS - 2002 in relation to metabolic response as seen results of laboratory results was 26.7%, which means that NRS-2002 has the ability to screen trauma patients who actually enter a metabolic response condition at 26.7% . The specificity value of NRS - 2002 to metabolic response as seen from laboratory result was 100%. The ability of NRS-2002 to screen trauma patients who are completely excluded from metabolic conditions was 100%. Positive predictive value a / (a + b) × 100 = 4 / (4 + 0) × 100 = 100%. This indicates that the true proportion of trauma patients included in the metabolic condition was 100%. The negative predictive value d / (c + d) × 100 = 7 / (11 + 7) × 100 = 38%. This suggests that the proportion of trauma patients actually excluded from entry into metabolic conditions was as much as 38%.

Based on analysis of Table 4, it was found that MUST's sensitivity value in relation to metabolic response seen in the result of laboratory test was 46.6%. MUST has the ability to screen trauma patients who actually experience entry with metabolic conditions at 46.6%. The specificity of MUST was 57.1%. MUST has the ability to detect negative outcomes in trauma patients. The ability of MUST to screen trauma patients who are completely excluded from metabolic conditions was 57.1%. Positive predictive value a / (a + b) × 100 = 7 / (7 + 3) × 100 = 70%. This suggests that the true proportion of trauma patients included in the metabolic condition was as much as 70%. The negative predictive value d/(c + d) × 100 = 4 / (8 + 4) × 100 = 33%. This suggests that the proportion of trauma patients who are completely excluded from metabolic conditions was 33%.

DISCUSSION

Comparing specificity, sensitivity and AUC (Area Under Curve) on the use of Nutritional Risk Screening (NRS-2002) in relation to metabolic response in trauma patients and gold standards of nutrition

Based on the analysis of Table 3, it was found that the sensitivity value of NRS - 2002 in relation to metabolic response s seen in laboratory results was 26.7%, which means that NRS-2002 has the ability to screen trauma patients who actually enter at metabolic response condition at 26,7%. Based on the analysis Table 1, it was found that the sensitivity value of NRS - 2002 used to calculate the risk of malnutrition as seen in the laboratory test was 62.5%. NRS-2002 has the ability to screen trauma patients who are actually at risk of malnutrition: the result was 62.5%. It can be seen that the sensitivity of NRS-2002 in relation to metabolic response was low compared to the gold standard. However, the NRS-2002 sensitivity value against the standard was still low, when compared to the research conducted by Ansari, et al. (2014). In the study conducted by Ansari, et al. (2014), obtaining a sensitivity score against the gold standard was 82.4%. This is in contrast to research conducted by Simanjuntak (2010), which obtained a sensitivity value of 53.7% against the standard. This suggests that the higher albumin and hemoglobin levels the lower the NRS-2002 score, which means that there is less risk of malnutrition.

High sensitivity is required if the disease is highly lethal and early detection can significantly improve prognosis (Richard, et al., 2003). The purpose of screening itself is to prevent disease or disease by identifying individuals at a point when the disease process can be changed through intervention. Since the NRS-2002 sensitivity rating for metabolic conditions is low, it cannot be said that the higher the metabolic response value of BUN and blood glucose, that the NRS-2002 score is also small. This is although the metabolic response is associated with the risk of malnutrition.

Low sensitivity values indicate a high false negative value, which occurred in as many as 11 patients. This was where the patients experience a metabolic response characterised by increased BUN and blood glucose but no risk of malnutrition. The risk of malnutrition is strongly related to the total amount of protein taken in per day (William, et al., 2004). This is because it is directly related to albumin and blood hemoglobin levels. In this study, the majority of patients were elective surgery patients, but here the researchers did not classify which patients were due elective surgery and which were not. In a study conducted by Azizah (2010), it showed that a high intake of daily protein will increase BUN and blood glucose.

The specificity value of NRS - 2002 in relation to metabolic response as seen from the laboratory test was 100%. The ability of NRS-2002 to screen trauma patients who were completely excluded from having a metabolic conditions was 100%. The specificity value of NRS - 2002 used to calculate the risk of malnutrition as seen from the laboratory results was 100%. NRS-2002 has the ability to detect negative results in trauma patients, so the ability of NRS-2002 to screen trauma patients with absolutely no risk of malnutrition was 100%. Here the specificity value of NRS-2002 in relation to metabolic response was very high. This is consistent with Richard, et al.'s study (2003) who state that if you want to get a specificity value of 100% then the value of sensitivity should be less than 100%. An increase in sensitivity will cause a decrease in specificity, and vice versa. NRS-2002 obtains a perfect specificity value because a false-positive value is equal to 0.

The value of AUC between NRS - 2002 in relation to BUN and blood glucose levels was 58% and 59% with 95% confidence interval. The value of AUC between NRS-2002 on relation to albumin and hemoglobin levels was 77.3% and 64.3% with 95% confidence interval. NRS-2002 has a moderate value of accuracy to calculate the risk of malnutrition, but

NRS 2002 has a weak accuracy to relation to metabolic conditions. The research conducted by Ansari, et al. (2013), it showed that get an AUC's value of 58.3% to calculate albumin levels.

Comparing specificity, sensitivity and AUC (Area Under Curve) on the use the Malnutrition Universal Screening Tool (MUST) in relation to metabolic conditions in trauma patients and gold standards of a nutrition

Based on the analysis of Table 4 it was found that the sensitivity of MUST in relation to the metabolic response as seen results of the laboratory test was 46.6%. MUST has the ability to screen trauma patients. Based on the analysis conducted on Table 2, it was found that the MUST sensitivity value against malnutrition risk as seen in laboratory test was 75%. MUST has the ability to screen trauma patients who are actually at risk of malnutrition at 75%. This suggests that the MUST sensitivity value of the metabolic response is lower when compared to the MUST sensitivity of the risk of malnutrition.

The specificity of MUST on metabolic response as seen from the laboratory test was 57.1%. MUST has the ability to detect negative outcomes in trauma patients. The ability of MUST to screen trauma patients who are completely excluded from metabolic conditions was 57.1%. MUST's specificity value on malnutrition risk as seen from the laboratory test was 64.7%. MUST has the ability to detect negative outcomes in trauma patients, so the ability of MUST to screen trauma patients with absolutely no risk of malnutrition was 64.7%. This suggests that MUST's specificity value for metabolic response is lower than that of MUST and the risk of malnutrition. The low specificity of the specificity is not a problem, since most of the trauma patients in this study were post-operative patients, there may be various complications (Lomivorotov et al., 2013). Malnutrition itself still means thet there are less extensive and different understandings of the nutritional risks, which can be interpreted as a change in nutritional status for the better or worse because the results of the disease or post-trauma, depending on the actual or potential nutrients and metabolic status (Sun, et al 2015). The theory between trauma, metabolic response and death is related (Simsek, et al, 2014). The body responds to trauma with a state of tachycardia, an increased use of oxygen, increased respiratory rate, an increase in body temperature as well as an increase in the negative nitrogen balance of, for example catabolism. The flow phase, also called catabolism, can occurs more than 2 days post-trauma. The flow phase is an early period of catabolism that provides a compensatory response to early trauma and volume replacement, except in the case of most minor injuries. In this phase, the metabolic response is directly related to the supply of energy substrates and proteins to protect the repair of tissue damage and the function of critical organs. The increased body oxygen consumption and metabolic rate is among these responses. In the early catabolic stages, catecholamine (adrenaline) is responsible for increased production and energy consumption. High plasma urea is one of the abnormal features of the protein catabolism process accompanied by a negative nitrogen balance.

In the research conducted, not all patients have increased BUN. According to Simsek, et al. (2014) elective surgery and minor surgery may show decreased protein synthesis and protein degradation. Increased levels of nitrogen urine and negative nitrogen balance can be detected early after surgery and the peak is on the 7th day. Protein catabolism can last for 3-7 weeks. All patients were measured on day 2 so not all patients showed an increase in BUN. After trauma lipolysis increases and fat is used as a source of energy. Lipoprotein lipase is attached to the capillary endothelium which will convert triglycerides into glycerol and free fatty acids. Heparin will release the lipoprotein lipase enzyme into the circulation resulting in intravascular hydrolysis. In trauma lipoprotein lipase muscle activity increases but in adipose tissue decreases in contrast to sepsis this lipase activity in muscle decreases. Surgery affects metabolism and substrate utilization. Post-operation, glucose utilization decreases as insulin time becomes resistant with elevated triglycerides and free fatty acids. Insulin resistance post-operatively is prevented in elective surgery, e.g. the administrations of carbohydrates prior to surgery (Soop, et al., 2007). In this study, the majority of patients were elective surgery patients, but the researchers did not classify between patients who were undergoing elective surgery and who were not.

The value of AUC between MUST to BUN and blood glucose levels was 56.8% and 46.1% with 95% confidence interval. While the AUC value between MUST to albumin and hemoglobin levels was 64.3% and 64.3% with 95% confidence interval. MUST has a moderate value of accuracy to calculate the risk of malnutrition, but MUST has a very weak accuracy value in relation to metabolic conditions.

Differences in the effectiveness of using Nutritional Risk Screening (NRS-2002) and the Malnutrition Universal Screening Tool (MUST) in relation to metabolic conditions in trauma patients

According to Schieccer, et al. (2008), a higher 2002 NRS score was found to be quite predictive of the risk of complications and death. In Raslan, et al. (2011) which compared the Area Under Curve (AUC) between NRS 2002 and MUST, it shows that NRS 2002 is better than MUST. A study conducted by Ozkhalanli, et al (2009), NRS showed good predictive validity for the occurrence of post-operative complications.

MUST was originally designed to not only determine nutritional status, but also to predict outcomes in adults, as well as the elderly inpatients. In the study conducted by Henderson, et al. (2008)

MUST with NRS 2002 was used to predict mortality in older patients who were inpatients, in which the studies examined indicated less mortality, so MUST therefore has poor predictive validity. Further study of MUST's predictive validity in the elderly population is needed. In 2006, the Association Dietician Indonesia (AsDI) began introducing the Proses Asuhan Gizi Terstandar (PAGT) adopted from the Nutrition Care Process, created by the American Dietetic Association (NCP-ADA). The PGAT was prepared as an effort to provide quality nutritional care. The process supports and leads to individual nutritional care. The Standard Nutrition Care Process consists of 4 steps ranging from nutritional assessment, nutrition diagnosis, nutritional intervention, monitoring and evaluation. The advantage of this study, is that it can quickly and easily predict the trauma patient's nutritional condition. so the risk of metabolic conditions can be treated early. A limitation of this study was not examining the hormone levels, during the biochemical examination. This is because the metabolic response is strongly influenced by the hormone levels of trauma patients. In hospitals, the NRS-2002 instrument is better suited to predicting the presence of metabolic conditions in trauma patients than MUST.

Nutrition screening is an entry into the PAGT cycle, with the goal being to obtain sufficient information to identify any relationships with nutritional problems. Patients who are identified as malnourished need nutritional care through screening and referral. Nutrition screening should be a simple and quick process that can be done by nurses and medical staff (Barendregt, 2008). The assessment of the nutritional status of hospitalised patients will result in better accuracy when it comes nutritional interventions so as to enhance biochemical and clinical indicators. This has an impact on the outcome of hospitalisation, accelerating the disease and reducing the complication of disease, so that it can shorten the length of hospitalisation and preventing the malnutrition of the hospital patient. Nutrition services in hospitals are the right of everyone, and require a guideline to obtain quality service results. Quality nutrition services in hospitals will assist the patient's healing process, which means shortening the length of their stay, which can save medical expenses.

CONCLUSION

There is a significant difference in effectiveness between the uses of Nutritional Risk Screening (NRS-2002) with the Malnutrition Universal Screening Tool (MUST) in relation to change in the metabolic conditions of trauma patients. The use of the NRS-2002 instruments is more effective than the MUST for measuring changes in the metabolic conditions of trauma patients. NRS 2002 has the ability to identify patients not in metabolic negative state, and the value of NRS 2002 accuracy is higher than MUST.

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Original Research

Demographical Factors, Not Lifestyle Factors, Associated with the Increase of Random Blood Glucose in Coastal Areas

Nilam Yusika Sari, Susy K. Sebayang, Septa Indra Puspikawati, Desak Made Sintha Kurnia Dewi, Ayik M. Mandagi and Erni Astutik

Faculty of Public Health, Universitas Airlangga, Banyuwangi, Indonesia

ABSTRACT

Introduction: Blood glucose is an important component in the body produced by the consumption of carbohydrates, proteins, and fats. A blood glucose imbalance causes an increase in the blood glucose level in the body. The occurrence of economic changes due to tourism may lead to a change in diet that can lead to increased blood glucose levels. This study aims to analyse the factors related to random blood glucose in people living in coastal tourism areas in Banyuwangi

Methods: The study used a cross-sectional survey. A total of 112 respondents were recruited using the random sampling method, using two-stage cluster sampling techniques taken from the Head of household data in multiple villages. The factors studied included demographic, socioeconomic, lifestyle, and family health history.

Results: The results showed that men had 28% higher random blood glucose compared to woman. People living in Bangsring had 31% higher random blood glucose compared to those in Buluagung.

Conclusion: Local health care services should put extra effort into include men and those living in Bangsring in programs to prevent Diabetes Mellitus in coastal areas.

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CONTACT

Erni Astutik
erniastutik@fkm.unair.ac.id
Faculty of Public Health, Universitas Airlangga, Banyuwangi, Indonesia

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INTRODUCTION

Diabetes Mellitus is now a serious health problem in the community. This disease has become a burden on a global level. Since 2000, the World Health Organisation (WHO) estimated that Asia would become the continent with the world's largest number of Diabetes Mellitus sufferers, reaching 82 million people. The number would continue to increase for the next 25 years (Sucipto, 2012). Meanwhile, Diabetes Mellitus prevalence in Indonesia had increased by 1% from 2007 to 2013. The three provinces with the highest frequency of Diabetes Mellitus are Yogyakarta, Jakarta and North Sulawesi (Fehni et al., 2017).

People with random blood glucose are at a higher risk of developing Diabetes Mellitus. Uncontrolled Diabetes Mellitus disease can have both long-term and short-term effects that are harmful to overall health. Long-term effects that may occur include the emergence of other degenerative diseases, such as heart disease, stroke, nerves, kidneys, and other health disorders. Meanwhile, in the short term, Diabetes Mellitus causes visual disturbances, fatigue, frequent thirst, and increased urination (Arif, 2014). In addition, this disease can affect quality of life. Efforts to manage living with Diabetes Mellitus are not easy and can even cause stress, triggered by the fear of complications (American Diabetes Association, 2000).

The increase of Diabetes Mellitus is not only happening in urban areas, but also in rural, coastal and tourism areas. Tourism indirectly affects the health of the community living near to the tourism destination. Influential factors such as age, sex, education, occupation, lifestyle, and health history play an important role. This needs to be resolved and a solution found in order to maintain optimal public health status.

There are many items of literature that have analysed the determinants of high blood glucose. A study conducted by Sudaryanto (2014) states that those with a family health history of high blood glucose levels had a 25-fold chance of the incidence of Type II Diabetes Mellitus in the working area of the community health centre of Nusukan, Banjarsari. In addition, there was also a relationship between age and the incidences of Diabetes Mellitus in the community health centre of Nipah Panjang East Jabung regency, with those aged > 45 years having the highest risk (Erris, 2015). A study conducted by Wicaksono (2011) showed that those who were overweight respondents had double, those with smoking habits had triple, and those with bad dietary pattern had double the risk of developing type II Diabetes Mellitus.

However, studies on the determinant of high blood glucose level in coastal tourism areas in Indonesia are scarce. This has become an important problem, considering the increasing number of coastal tourism destinations. Economic improvements in the coastal tourism areas may change dietary patterns and lifestyle, and thus increase the overall blood glucose level of the community. Therefore, this study assessed the determinants of elevated blood glucose levels in people living in coastal tourism areas in Banyuwangi, which included demographic, socioeconomic, lifestyle, and family history factors.

MATERIALS AND METHODS

This study analysed the data taken from the results of a cross-sectional survey that assessed the factors related to Metabolic Syndrome in people living in coastal tourism areas in Banyuwangi. The survey was conducted from September to November 2016. The survey was approved by the Ethics Committee of the Faculty of Public Health, Universitas Airlangga.

Sampling

Two-stage cluster sampling was employed in order to select the participants. Participating sub-districts included all of the 5 sub-districts with coastal tourism destinations in Banyuwangi. Of the 52 villages in the participating sub-districts, 22 villages had a coastline and thus fell within the selection criteria. Based on this, 5 villages were randomly selected to become the study locations: Kampung Mandar (Banyuwangi Sub-district), Ketapang (Kalipuro Sub-district), Grajagan (Purwoharjo Sub-district), Bangsring (Wongsorejo Sub-district), and Buluagung (Siliragung Sub-district). A sample of 112 respondents were randomly selected from a list of Heads of the household. The inclusion criteria were that the participants were within the age range of 18 – 59 years old, and looked healthy. The number of samples was sufficient enough to detect a 67% difference in the proportion of the determinants of elevated blood glucose levels with a 5% error, 90% power, 2 design effects and 25% rejection probability (Lemeshow et al, 1990).

Data Collection

The data was collected by trained officers consisting of students with a Public Health Science background who had taken at least 3 semesters of university-level education. Blood collection was done by a trained nurse using Accu Check. Anthropometric measurements were performed by the students using SECA 213 for stature and SECA 869 for the scales. The participant's mental and emotional status was measured using a Self-Reported Questionnaire used by the National Survey in Indonesia (Basic Health Research, 2007). The research questionnaire was tested for validity and reliability in Kepatihan Village in Banyuwangi District on October 1st, 2016. The Cronbach alpha was 0.72. The questionnaire was found to be valid as the r count was greater than the r table.

Data Analysis

The dependent factor in this study was random blood glucose. This was transformed using log transformation because the distribution was skewed to the right. The independent factors consisted of demographic factors (age, sex, location), socioeconomic factors (education level, occupation, socioeconomic status), lifestyle factors (smoking habit, stress level and nutritional status) and family health history, which included any one of the three following diseases: Diabetes Mellitus, high blood pressure, and obesity.

The demographic factors included age, sex, and location. Age was categorised into: young (<43 years) and old (≥43 years) based on the median value. Sex was divided into men and women. The location of the research were the five aforementioned study locations. The socioeconomic factors included levels of education: low (no school, not finished primary school, finished primary school), medium (finished junior high school or high school), and high (had higher education). Occupation was categorised into not working and working. Wealth status was obtained using a Principal Component Analysis of the respondent's asset ownership and was grouped into very poor, poor, medium, rich, and very rich. Lifestyle factors included smoking habits (smoking and non-smoking), as well as mental-emotional status score: low (value <6) and high (value ≥6); and nutritional status: normal (BMI <24.9) and overweight (≥25). Family health history was divided into their relatives having at least one history of disease and not having any history of hypertension, obesity, and Diabetes Mellitus.

Bivariate and multivariate analysis was done using a Linear Regression Test. The factors that have an association with blood glucose level with $p < 0.25$

Table 1. Characteristics of Respondents

Factor	Frequency	Percentage (%)	Means (log Blood Glucose)
Demographic Factors			
Age			
Young < 43 years	53	47.3	4.63
Old ≥ 43 years	59	52.7	4.79
Sex			
Female	67	59.8	4.60
Male	45	40.2	4.89
Location			
Buluagung	18	16.1	4.56
Kampung Mandar	19	17	4.80
Ketapang	21	18.8	4.78
Bangsring	30	26.8	4.77
Grajagan	24	21.4	4.64
Socio-Economy Factors			
Level Of Education			
Low	27	24.1	4.64
Medium	69	61.6	4.70
High	16	14.3	4.92
Work			
Not Working	46	41.1	4.70
Working	66	58.9	4.73
Social Economy			
Very Rich	20	17.9	4.62
Rich	21	18.8	4.70
Medium	26	23.2	4.75
Poor	21	18.8	4.77
Very Poor	24	21.4	4.76
Life Style Factors			
Smoking			
Smoking	21	18.8	4.72
Non-Smoking	91	81.3	4.69
Stress Level			
High >=6	29	25.9	4.69
Low <6	83	74.1	4.72
Nutritional Status Based On IMT			
Normal	42	37.5	4.70
Overweight	70	62.5	4.72
Family Health History Factors			
With History	28	25.0	4.70
No History	84	75.0	4.72

were included in the multivariate analysis. The final regression model was selected using a backward elimination technique. The assumption for regression was also tested.

RESULTS

The study was conducted with the participation of 112 respondents, 99.1% of which had breakfast before their blood was drawn.The results showed that 52.7% of the respondents were ≥ 43 years old. More than half of the respondents were women (59.8%) and the largest number of respondents came from Bangsring (26.8%). The least number came from Buluagung (16.1%). Most of the respondents had a medium level of education, i.e. they had attended junior and senior high school (61.6%) and most of the respondents worked (58.9%). For the lifestyle factors, most of the respondents did not smoke (81.3%) and 25.9% had a high-stress level. In addition, most of the respondents were overweight (80.4%). When viewing the family health history, 75% of the respondents did not have any history of health problems associated with increased blood glucose in their family (Table 1).

Based on the bivariate analysis, age, gender, location, education, and social economy were associated with random blood glucose with a p-value <0.25. After backward elimination was conducted in the multivariate analysis, sex and location had a significant relationship with increased random blood glucose. Age was maintained in the final model because of its confounding with gender. When we used age as a continuous variable, the association remained insignificant. After adjustment for the covariates, the male respondents had 28% higher blood glucose levels than the women (95% CI: 10.5 – 49.2, $p < 0.001$).The respondents in Bangsring had 31% higher blood glucose levels than those in Buluagung (95% CI: 5.1 – 61.6, $p = 0.02$).

DISCUSSION

Our study showed that there was a significant relationship between increased random blood glucose levels and the demographic factors

Table 2. Determinants of Increased Random Blood Glucose Levels

Factors	Category	Coef.	95% CI	P Value	Adjusted Coefficient	95% CI	P Value
Demographic Factors							
Age	< 43 years	**Ref**			**Ref**		
	≥ 43 years	0.17	0.02 – 0.31	0.03	0.12	-0.04 – 0.27	0.13
Sex	Female	**Ref**			**Ref**		
	Male	0.29	0.15 – 0.43	0.00	0.25	0.10 – 0.40	0.00
Location	Buluagung	**Ref**			**Ref**		
	KampungMandar	0.24	-0.01 – 0.49	0.06	0.23	-0.10 – 0.46	0.06
	Ketapang	0.22	-0.03 – 0.47	0.08	0.20	-0.03 – 0.43	0.08
	Bangsring	0.20	-0.02 – 0.43	0.08	0.27	0.05 – 0.48	0.02
	Grajagan	0.08	-0.16 – 0.32	0.50	0.07	-0.15 – 0.29	0.54
Socio-Economy Factors							
Level of Education	Low	**Ref**					
	Medium	0.06	-0.11 – 0.24	0.49			
	High	0.29	0.05 – 0.53	0.02			
Work	Not Working	**Ref**					
	Working	0.02	-0.13 – 0.17	0.80			
Social Economy	Very Rich	**Ref**					
	Rich	0.08	-0.15 – 0.32	0.49			
	Medium	0.13	-0.09 – 0.35	0.24			
	Poor	0.16	-0.08 – 0.39	0.19			
	Very Poor	0.13	-0.09 – 0.38	0.28			
Life Style Factors							
Smoking	Smoking	**Ref**					
	Non Smoking	0.05	-0.15 – 0.24	0.64			
Stress Level	High >=6	**Ref**					
	Low <6	0.03	-0.13 – 0.20	0.69			
Nutritional Status Based On IMT	Weigt	**Ref**					
	Overweight	0.02	-0.13 – 0.17	0.80			
Family Health History Factors							
	With History	**Ref**					
	No History	0.03	-0.15 – 0.20	0.77			

represented by sex and the location of the study, but not with socioeconomic status, lifestyle, or family health history. The male respondents had higher random blood glucose levels compared to women, and those living in Bangsring village had higher random blood glucose levels than those living in Buluagung.

Our results showing that men had more elevated blood glucose levels compared to women, which is not in line with the research conducted by Wicaksono (2011) and Tjekyan in the Palembang Municipality (2010). Another study showed that women experience more dramatic changes in relation to hormones and their bodies due to the reproductive factors that fluctuate over the duration of their lifetime. Therefore, women have higher blood glucose levels than men (Willer, et al., 2016). In addition, another study focused on the coastal area of India showed that women had a 1.4 times greater risk of mild diabetes (Rao et al., 2010), which is different from our results. However, in line with our study, Ohtaet al. (2014) showed that increased levels of blood glucose characterised by hyperglycemia occurred faster in male compared to female rats.

We cannot offer an explanation as to why men had higher blood glucose level compared to women in our study, other than the possibility of having a higher food intake during breakfast. Those living in Bangsring had higher blood glucose levels compared to Buluagung. Although not statistically significant, those living in Ketapang and Kampung Mandar also had similar estimates to Bangsring. Two possible explanations for this was that people in these villages depend more on fishing and have a lower socioeconomic status. The lack of association between random blood glucose and lifestyle may indicate that the lifestyle factors may not have changed much within this particular community.

To date, this is the first study on random blood glucose level focused on the coastal areas of Banyuwangi. The advantages of this study are that we assessed various determinants, including the demographic, social economy, lifestyle, and family health history factors. The study, however, did not measure fasting and two hours post-prandial blood glucose level. Therefore, it is not known with certainty the tendency for Diabetes Mellitus. However, random blood glucose tests were been used

to screen for Diabetes Mellitus. In addition, the study did not measure food intake and thus, we could not take into account this important factor as a possible determinant.

The results showed that men and those living in Bangsring Village may need extra attention when it comes to Diabetes Mellitus prevention programs. A previous research study showed that more women in the community sought access to the available health care services compared to men (Sebayang, 2017). The large number of men with potential Diabetes Mellitus may neglect their health, and this must be addressed immediately. One thing that can be done is to optimise the implementation of Posbindu PTM (Integrated Non-Communicable Disease Management Post) for both women and men with anthropometric measurements, blood pressure measurements, blood glucose checks, cholesterol checks and health counselling regularly and periodically, especially for those living in Bangsring. Future studies need to look for changes in food intake in this community and to assess its possible impact on health.

CONCLUSION

Research conducted in the coastal tourism areas of Banyuwangi showed that demographic factors had a significant association with elevated random blood glucose levels in the male respondents. Those living in Bangsring also had a higher random blood glucose. The health care system should make an extra effort to include men and those living in Bangsring in their Diabetes Mellitus prevention program.

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Original Research

The Effectiveness of Spiritual Emotional Breathing Towards Respiratory Function and Immune Response of Tuberculosis Patients

Kusnanto Kusnanto, Joni Haryanto, Tintin Sukartini, Elida Ulfiana and Made Mahaguna Putra

Faculty of Nursing Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Introduction: Tuberculosis is one cause of infectious death worldwide. In relation to the healing of pulmonary tuberculosis in Indonesia, there are still certain areas where the cure rate is still low. This study aims to identify the effect of spiritual emotional breathing (SEB) on the quality of respiratory function and the modulation of immune response in tuberculosis patients.

Methods: The study used a quasi-experimental design with two groups of pre-post-test design. The population was 34 patients with tuberculosis in East Perak's primary health care. The independent variable was SEB (spiritual emotional breathing). The dependent variables were peak expiratory flow rate (PEFR), pulse, oxygen saturation, breath frequency, breath sound, stiffness complaints, human IL-2, human cortisol, IgG.

Results: The results showed that there was a significant difference in PEFR, pulse, oxygen saturation, respiratory rate, respiratory sound, stiffness, human IL-2, human cortisol, IgG.

Conclusion: SEB can improve the quality of respiratory function and the modulation of immune response in tuberculosis patients. The emotional spiritual approach is part of the science of energy psychology that aims to turn the negative energy in a person into positive energy that can help the healing process. This therapy is performed as a complementary therapy for TB patients to improve their quality of life and the control of symptoms.

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CONTACT

Kusnanto Kusnanto
✉ kusnanto@fkp.unair.ac.id
Faculty of Nursing Universitas Airlangga, Surabaya, Indonesia

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INTRODUCTION

Tuberculosis is one cause of infectious death worldwide (WHO, 2008). The healing of pulmonary tuberculosis in Indonesia is still low in certain areas. The disease is chronic, and can affect the quality of life of the sufferer. Patients living with tuberculosis (TB) experience the significant disruption of their social life and are exposed to both stigma and discrimination. Pulmonary tuberculosis poses serious problems, relating to the concept of quality of life consisting of the aspects of physical, psychological, social, and environmental health (Kusnanto, Pradanie and Karima, 2016). TB is a common cause of death in people with HIV. The duration of the treatment for tuberculosis is prolonged, and is at least 6 months for drug-prone TB and 18-24 months for multi-drug resistant TB (MDR-TB), which does not respond to the two most effective anti-TB drugs, isoniazid and rifampicin. Long-term treatment, adverse drug reactions during the TB treatment, stigma and financial burden contribute to poor treatment and treatment outcomes. In addition, ensuring patient adherence to treatment through a direct facility for observation therapy (DOT) competes with patient-centered services, adding to the involved finances. The costs come from out-of-pocket and there are indirect costs associated with the treatment. This is even though anti-TB drugs are given free of charge in most countries. Rapid healing of the symptoms of TB at the onset of treatment also contributes to improper patient care (i.e. people who are lost to follow-up) as competing interests are prioritised. Poor treatment obedience and the negligence of follow-up increases the morbidity, mortality, and risk of developing drug resistance, and can lead to prolonged TB transmission (Hoorn et al., 2016).

EFT (emotional freedom technique) is one of the therapeutic groups that is referred to as

psychological energy (Church et al., 2012). EFT is a mild and non-invasive form of emotional acupressure by using an acupuncture meridian called "acupuncture without needles". Tapping the meridian point on the upper body releases the energy blockage ("energy therapy") and reinforces the patient's cognitive change for them to take full responsibility for their own health and well-being (Bougea et al., 2013). In addition, there is a repetition of self-acceptance statements, which are suggested to contribute to cognitive restructuring, a well-known psychotherapeutic technique, in which individuals identify and correct negative thoughts (Patterson, 2016). The effectiveness of SEFT (Spiritual Emotional Freedom Technique) lies in the merging of Spiritual Power with Energy Psychology. Spiritual Power contains the five main principles of sincerity, confidence, gratitude, and patience. Energy Psychology is a set of principles and techniques utilising the body's energy system to improve the state of the person's mind, emotions, and behaviour. Chemical imbalances and energy disturbances in the human body can cause emotional distress, including depression. SEFT intervention in the body's energy system can change the chemical conditions in the brain (neurotransmitter), which can further change the emotional condition of a person, including the condition of depression. In addition, SEFT is effective, easy, fast, cheap, the effect can be permanent and there are no side effects. It is universal and empowers the individual (so they are not dependent on the therapist), and it can be explained scientifically (Astuti, Yosep and Susanti, 2015).

Spiritual Emotional Breathing (SEB) is a therapy using the Spiritual Emotion Freedom Technique (SEFT), which is then followed by breathing exercises. The emotional spiritual approach is a part of the science of energy psychology that aims to turn the negative energy in a person into positive energy that can help the healing process. (Zainudin, 2006). This approach is done using the body's energy system to cure patients, as in acupuncture or acupressure, but with simple techniques. The process consists of three stages, namely the set-up, the tune-in and the tapping. The set-up aims to ensure the proper flow of bodily energy. The tune-in aims to direct our mind to the pain and to feel the pain that we experience. The tapping is a light tap on certain points that neutralises emotional and pain disorders (Zainudin, 2006).

In improving the immunological factor, our study shows that EFT can increase lymphocyte proliferation. There is the assumption that greater proliferation is associated with more effectiveness when it comes to an immune response (Aggarwal and Gurney, 2002). Furthermore, EFT can increase IL-17 in the peripheral blood of chemically and pulmonary injured veterans. IL-17 is a pro-inflammatory cytokine produced by activated memory T cells, that has a key role in the host's defence against microbial infections such as mycobacterium tuberculosis (Jovanovic et al., 1998). It has a key role in the initiation and maintenance of inflammatory responses (Zhang et al., 2012). The cells that produce IL-17 have an important role in controlling both immune and inflammatory reactions (Lutgendorf and Costanzo, 2003). Many studies have shown that stress can affect the function and number of immune cells (Carlson et al., 2004), the production of many cytokines, like IL-4, IFN-γ, L-10 and the reduction of lymphocyte proliferation (Lengacher et al., 2013). The main objectives of this study were to analyse changes in breath frequency, PEFR, oxygen saturation, breath sound, congested, cortisol, IL-2, and IG. The second goal was to explain the relationship between the variables.

MATERIALS AND METHODS

This research was a quasi-experimental research study with a non-randomised (purposive sampling) Control Group Pre-test and Post-test Design. The sample in this study was made up of 34 people with the inclusion criteria of 1) positive acid-resistant bacteria TB patient, 2) productive age and 3) got standard therapy from primary health care. The exclusion criteria in this study were that they were TB patients with complications. The independent variable in this research was SEB (Spiritual Emotional Breathing), while the dependent variables in this research were cortisol, IL-2, IgM, PEFR, Oxygen Saturation, Respiratory Rate (RR), Pulse, Complaints, and breath sound.

First, we selected patients who met the inclusion criteria from each group in the first part of the study, and we enrolled those patients into the second part of the study. The patients were divided into 2 groups of 17 patients, and they were trained using an original program. The patients were also instructed to practice daily exercise at home. Before the exercises, the patient was trained beforehand and given guidance. Compliance with daily exercise was assessed weekly using an observation sheet filled in with the patients at home. The assessments were repeated 12 weeks after the beginning of the SEB program. SEB involves focusing on the situation identified as causing distress and tapping on specific meridian points of the body with breathing retraining, which consisted of relaxation, pursed lip breathing, and slow-deep breathing with training occurring in both the supine and sitting positions using the classic method of Miller (Miller, 1954), with slight modifications. Intervention was performed once a day. The control group was given treatment according to the standard of care in the primary health care centre. The respondent's sampling was done by the purposive sampling method. The sample was taken by a nurse in primary health care. The samples were then analysed at the Institute of Tropical Diseases.

The place of study was East Perak primary health care, January - February 2015. The instrument used

was a peak flow meter to measure PEFR. Pulse oximetry was used to measure SaO2. Salivary Cortisol ELISA was used for the cortisol examination. The lowest detectable level of cortisol that can be distinguished from the Zero Standard is 0.537 mg/mL or 0.0537 µg/dL at the 95% confidence limit. Legend Max Human IL-2 Elisa used for the human IL-2 examination, and the minimum detectable concentration of IL-2 is 4 pg/mL. Gen Way Mycobacterium IgG was used for the examination of IgG, with a clinical sensitivity of 100%. The salivary cortisol and IgG concentration were determined using an enzyme-linked immunosorbent assay. The collected data was analyzed using a paired t-test. The instrument used in the research was made in Japan. The analysis was conducted using SPSS with Paired t-test ($p \leq 0.05$). The ethical considerations were met, as the participants signed an informed consent form. Moreover, their privacy, confidentiality, and voluntary participation was ensured. The study was approved by the Health Research Ethics Committee Faculty of Nursing Universitas Airlangga (No. 57-KEPK).

RESULTS

Based on Table 1, the number of the intervention and control group respondents was 17 people. The number of male respondents in the intervention group was 76.47% and in the control, it was 52.94%. The female respondents in the intervention group were 23.52% and 47.05% respectively. The mean age of the respondent intervention group was 41.17 years and in the control group, it was 47.76 years.

The mean human value of IL-2 in the intervention group before intervention was 30.95, and after intervention, it was 45.52. The mean values of the human cortisol group before and after intervention were 156.64 and 137.60 respectively. The mean IgG groups of before and after intervention were respectively 10.75 and 14.58.

Table 1 Demographic and Baseline Characteristics

Characteristics		Intervention	Control
Gender			
Male		13 (76.47%)	9 (52.94%)
Female		4 (23.52%)	8 (47.05%)
Age (year)		41.17	47.76
Breathing Pattern			
Pre test	Dyspnea	12 (70.59%)	10 (58.82%)
	Normal	5 (29.41%)	7 (41.18%)
Post test	Dyspnea	0 (00.00%)	12 (70.59%)
	Normal	17 (100.00%)	5 (29.41%)
Breathing Sound			
Pre test	Vesicular	11 (64.71%)	13 (76.47%)
	Not Vesicular	6 (35.29%)	4 (23.53)
Post test	Vesicular	17 (100.00%)	15 (88.24)
	Not vesicular	0 (00.00%)	2 (11.76)

DISCUSSION

Based on Table 2, there was an SEB effect on human IL-2, human cortisol, and Ig G. In improving immunologic factors, (Babamahmoodi et al., 2015) shows that EFT may increase lymphocyte proliferation. It is assumed that greater proliferation is associated with a more effective immune response. Furthermore, EFT may increase IL-17 in chemically-injured veteran's peripheral blood. IL-17 is a pro-inflammatory cytokine produced by activated memory T cells and has a key role in host defense against microbial infections, such as Mycobacterium tuberculosis. It has a key role in the initiation and maintenance of the inflammatory response. The cells that produce IL-17 have an important role in controlling immune and inflammatory reactions. Many studies have shown that stress can affect the function and number of immune cells, the production of many cytokines, such as IL-4, IFN-γ, L-10 and the reduction of lymphocyte proliferation. Furthermore, stress management intervention can reduce the immunosuppressive effects of stressors. There are many papers on the effect of other stress management techniques such as mindfulness-based stress reduction (MBSR) on immunological factors, but no studies of EFT and immunity. In Table 2, it can be seen that the decrease of the cortisol in the control group occurred because the respondent was able to manage the stress. Cortisol can be associated with emotions, and can cause long-term physiological effects (Trial, 2012).

The exercise of the respiratory muscles and chest muscles can increase lung capacity. The results showed a strong correlation between the diffusion capacity of vital pulmonary capacity. Exercise in the form of breathing exercises such as deep breathing exercises can be done by healthy people or lung problem sufferers in order to increase lung volume and capacity. The lung function status is identified by the ability of gas exchange to provide oxygen to the alveoli, so it is mutually sustainable to determine the oxygen saturation value. Doing deep breathing exercises can help in the process of oxygenation so that the saturation levels can persist within the normal range (Priyanto, 2010).

Deep breathing will reduce sympathetic reactions to improve respiratory patterns and decrease inspiratory and expiratory muscle contractions (Yadav, Singh and Singh, 2009). Shortness of breath may decrease as the breathing pattern changes from the rapid rate, which is under the control of the involuntary respiratory centre of the brain stem, and the pattern thus becomes more controlled. (Nusdwinuringtya, 2000). Our study had some limitations. To elucidate the effectiveness of SEB on non-TBC patients, a prospective, randomised, controlled study is necessary. Another limitation of our study was the difficulty of proving statistical equivalence. In general, to prove statistical equivalence, there needs to be a large sample size.

Table 2 Statistical Analysis

Variable	Intervention (Mean)		P value	Control (Mean)		P value
	Before	After		Before	After	
Human IL-2	30.95	45.52	0.00	32.75	44.06	0.01
Human Cortisol	156.64	137.60	0.01	131.02	43.52	0.79
IgG	10.75	14.58	0.00	8.29	3.48	0.10
PEFR	221.18	254.71	0.00	236.47	242.94	0.28
Heart rate	87.29	79.64	0.00	87.41	91.29	0.00
Saturation O2	98.29	95.70	0.00	87.41	95.94	0.00
Respiratory Rate	22.70	17.94	0.00	21.29	23.11	0.03

CONCLUSION

Spiritual Emotional Breathing (SEB) can decrease human IL-2, human cortisol, and Ig G. Using an emotional spiritual approach is a part of the science of psychological energy that is capable of improving the immune system. This therapy is performed as a complementary therapy for TB patients to improve their quality of life and the control of their symptoms. It is used as a therapy that supports major treatment therapies.

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Original Research

The Development of Model Family-Centered Empowerment on Caring for Children with Leukemia

Yuni Sufyanti Arief[1], Nursalam Nursalam[1], I Dewa Gede Ugrasena[2],Shrimarti Rukmini Devy[3] and Eileen Savage[4]

[1] Faculty of Nursing, Universitas Airlangga, Kampus C Mulyorejo, Surabaya, Indonesia
[2] Faculty of Medicine, Universitas Airlangga, Jl. Prof. Dr. Moestopo 47, Surabaya, Indonesia
[3] Faculty of Nursing, Universitas Airlangga, Kampus C Mulyorejo, Surabaya, Indonesia
[4] School of Nursing and Midwifery, University College Cork, Cork, Ireland

ABSTRACT

Introduction: Children with leukemia desperately need serious attention, commitment and it is a hard struggle for family members. Powerlessness experienced by the family will affect the ability of the families to provide care for their children. Many factors can affect the empowerment of families in providing care to their families

Methods: The purpose of this study was to develop a family-centered empowerment model related to the family's ability to care for their child suffering from leukemia. The research design used was an explanation survey. The sample consisted of 140 families with children suffering from leukemia in the pediatric ward of Dr. Soetomo Hospital.

Results: The family-centered empowerment model was formed from the family factor, patient factor and nurse factor. The greatest effect was on the nurse factor, with the T statistic value = 6.590.

Conclusion: Family factors and nurse factors need to be taken into account in family-centered empowerment. The patient factor has little influence on family empowerment in relation to caring for children. More research is needed on family-centered empowerment models in relation to their ability to care for children with leukemia. For example, a nurse providing a nursing intervention, especially a pediatric nurse, in relation to empowering a parent at the time of caring for their child with leukemia.

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CONTACT

Yuni Sufyanti Arief
✉yuni_sa@fkp.unair.ac.id
Faculty of Nursing, Universitas Airlangga, Kampus C Mulyorejo, Surabaya, Indonesia

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INTRODUCTION

Every child with a chronic illness such as leukemia grows and develops in a unique family and cultural environment with many different variations. With children with chronic health conditions, it is often assumed that meeting the health needs of the children and sustaining their family life are two major challenges faced by the families (Deatrick & Knafl, 1990; Dunst, 2011; Wuest & Stern, 1991).

Families and children with chronic health conditions often feel helpless when trying to meet their child's health care needs and when trying to sustain their family life (Popp, Conway, & Pantaleao, 2015). Based on the results of the interviews with mothers whose children were being treated for leukemia, related to the needs of childcare, the mothers stated that much of the daily health care advice is time-consuming, unpleasant, and that it felt burdensome. Family empowerment is an intervention that nurses can use to help families (Wright & Leahey, 2000). These interactive interventions are designed to help the family through a process of empowerment, consisting of several stages that can increase trust and family decision-making to allow them to work better with health professionals (Johansson, 2006). Activities are based on assumptions that everyone has the power,

capability and capacity to grow and become more competent.

Family empowerment is influenced by several factors such as the demands of care, family factors, patient factors and health care factors (Jones, Winslow, Lee, Burns, & Zhang, 2011). The constituent attributes of family empowerment can be assessed using self-efficacy, motivation, acceptance of threats, responsibility, respect, and care. The expected outcomes for families with such empowerment include the ability to negotiate with health professionals, minimising the effects of chronic conditions on children and their siblings, rearranging the family roles and responsibilities, satisfying their child's health care needs, and lowering their use of health care and costs (Chiu, Wei, Lee, Choovanichvong, & Wong, 2013).

Integrated and holistic cancer prevention should involve all of the components of the family factor because the needs of pediatric patients with cancer are complex, including the need to be pain-free, the need for attention, and the need for psychological support (Elcigil & Conk, 2010). To help people with cancer thoroughly, it takes serious effort and the family role is very important. Therefore, it is important to consider whether the Family-Centered Empowerment Model can improve the family's ability to treat children with leukemia.

MATERIALS AND METHODS

This research used an explanatory survey research design and was conducted in the Pediatric Ward of Dr. Soetomo Hospital Surabaya in the period June to September 2017. The population in this study consisted of families that have children suffering from leukemia in the pediatric ward, with a large sample of 140 respondents The sampling technique in this study was the consecutive method. The selection of samples was according to the criteria. The inclusion criteria in this study was mothers of pre-school-aged children with leukemia > 1 year who were undergoing chemotherapy treatment and mothers directly treating the child suffering from leukemia. The exclusion criteria of this study were unhealthy mothers and mothers who could not read and write.

The variables in this research were the family factor (motivation, cognition, perceived threat, structure & family function, stress, coping, social support, care receiver impairment, competing role demands, caregiving activities), nurse factor (empowering, enabling, supporting) patient (age, child status, duration of illness, disease severity). The data was collected through questionnaires. The questions in the questionnaire used in this study have been tested for their validity and reliability. The validity of each item was done by the Pearson Correlation test using a significance level of 0.005. The reliability of the items was tested using Cronbach's Alpha.

The questionnaire in this study was developed based on the concept of supporting theories. The indicator instrument of the family factor was developed based on the supporting theoretical concepts. Data related to motivation was measured using a Likert scale questionnaire, made by the researchers themselves based on the indicators of Abraham Maslow's theory. Cognitive data collection was measured based on the family's trust in the ability to treat childhood leukemia. The instrument used to collect the confidence data was done using a Self Efficacy instrument from Albert Bandura. Data relating to perceived threats was measured using a self-made questionnaire by the researchers based on the concept of the Health Belief Model (HBM). Data relating to family structure and function were measured using a FAD (Family Assessment Device) questionnaire. Data related to stress was measured using the Zung Self-Rating Anxiety Scale (SAS / SRAS). Data relating to family coping was measured using a checklist list of variables contained in the Family Coping Index (FCI) Nursing Service and Johns Hopkins School of Hygiene and Public Health, which includes the competence of the family in the care of their sick family members. Data related to social support was measured using a self-made questionnaire by the researchers based on the Friedman & Marylin family assessment concept (2003). Data relating to the parenting demands was measured using the caregiver reaction assessment.

Data collection related to the nursing factor (empowering, enabling, supporting), which can influence family empowerment, was measured using a self-made instrument by the researcher based on the family centre care concept on nursing care in children and a modification of the Family Empowerment Scale questionnaire. Data relating to Filial Value was measured using a filial value scale. Data related to the family's ability to treat children with leukemia used a revised Caregiving Appraisal Scale (RCAS) questionnaire consisting of 27-items in a self-administered questionnaire, using a 4-point Likert scale for item responses (Lee, Friedmann, J.Picot, Ann Thomas, & Ja KIm, 2007). Data relating to Perceived Health was measured using the Questionnaire Health Status Questioner (HSQ-12). Data relating to personal growth measurements was measured using the Personal Growth Initiative Scale (PGIS) questionnaire from Cristhine Robitschek (Robitschek, 1999). Data relating to the Existential Well Being measurements was measured using the Spiritual Well Being Scale (SWBS) questionnaire from Ellison.

The development of the Family-Centered Empowerment (FACE) model was done through focus group discussion activities with informants who played a role in the formation of the FACE model, including the families caring for children with leukemia, and nurses. The data was collected and analyzed using SmartPLS. An ethical test was conducted by team ethics RSUD Dr. Soetomo number 385 / Panke.KKE / V / 2017 dated: May 30, 2017.

Table 1 - Validity test results showing the development of the model for family-centered empowerment on the family ability of caring for children with leukemia.

No	Variable	Factor	Outer Loading	Description
1	Family Factor	X1.1 Motivation	0.692	Valid
		X1.2 Cognition	0.799	Valid
		X1.3 Perceived Threat	0.870	Valid
		X1.4 structure & family function	0.325	In Valid
		X1.5 Stress	-0.188	In Valid
		X1.6 coping	0.596	Valid
		X1.7 Social Support	0.767	Valid
		X1.8 Care receiver impairment	0.672	Valid
		X1.9 Competing Role Demands	0.589	Valid
		X1.10 Caregiving activities	0.645	Valid
2	Patient Factor	X2.1 Age	0.817	Valid
		X2.2 Child Status	0.789	Valid
		X2.3 Duration of illness	0.133	In Valid
		X2.4 Disease severity	0.856	Valid
3	Nurse Factor	X3.1 Empowering	0.899	Valid
		X3.2 Enabling	0.875	Valid
		X3.3 Supporting	0.879	Valid
4	Filial Value	X4.1 Responsibility	0.914	Valid
		X4.2 Respect	0.883	Valid
		X4.3 Care	0.831	Valid
5	Family Appraisal	X5.1 Challenge	0.924	Valid
		X5.2 Stressor	0.706	Valid
6	Caregiver outcome	Y1.1 Perceived Health	0.866	Valid
		Y1.2 Personal growth	0.869	Valid
		Y1.3 Existential wellbeing	0.687	Valid
7	Child Indicator	Y2.1 Nutrition Status	0.801	Valid
		Y2.2 Secunder Infection	0.893	Valid
		Y2.3 Frequecies of Bleeding	0.746	Valid

Table 2 - Reliability test result on the development of the model for family-centered empowerment on the family ability of caring for children with leukemia.

No	Variable	Chronbach Alpha	Composite Reliability	Description
1	Family Factor	0.508335	0.8905	Valid
2	Patient Factor	0.675922	0.8621	Valid
3	Nurse Factor	0.776507	0.9125	Valid
4	Family Appraisal	0.676337	0.8041	Valid
5	Filial Value	0.768920	0.9088	Valid
6	Child Indicator	0.664848	0.8555	Valid
7	Caregiver outcome	0.650083	0.8461	Valid

Table 3 -Hypothesis test results in relation to the development of the model for family-centered empowerment on the family ability to care for children with leukemia.

No	Variable	Path Coefficient	Standar Deviation	T Statistic	Explanation
1	Family Factor -> Filial Value	0.315307	0.082952	3.8011	Significant
2	Family Factor -> Caregiver outcome	0.083559	0.075237	1.1106	No significance
3	Patient Factor -> Filial Value	0.054482	0.077104	0.7066	No significance
4	Patient Factor -> Caregiver outcome	-0.164653	0.065742	2.5046	Significant
5	Nurse Factor -> Filial value	0.464863	0.070538	6.5903	Significant
6	Nurse Factor -> Caregiver outcome	0.053407	0.091932	0.5809	No significance
7	Family Apprasial -> Caregiver outcome	0.232694	0.083830	2.7758	Significant
8	Filial value -> Family Apprasial	0.497954	0.072752	6.8445	Significant
9	Filial value -> Caregiver outcome	0.340145	0.086861	3.9159	Significant
10	Caregiver outcome -> Indicator	0.288713	0.075624	3.8177	Significant

RESULTS

In this study, the outer model test was evaluated by performing the validity and reliability test on the outer model evaluated by the statistical T score. The validity of the test of the model can be seen from the value of outer loading in Table 1. Table 1 shows that there are 2 invalid indicators (Structure and function of family = 0.325, Stress = -0.188, illness length = 0.133) and 25 valid indicators with outer loading values >0.5. The value of outer loading in the family factor consists of motivation (0.692), cognition (0.799), perceived threat (0.870), coping (0.596), social support (0.767), care receiver impairment

(0.672), competing role demands (0.589) and caregiving activities (0.645). The factors of the patient consist of the indicators of age (0.817), child status (0.789) and disease severity (0.856). The nurse factor consists of empowering (0.899), enabling (0.875) and supporting (0.879). Filial value consists of the indicators of responsibility (0.914), respect (0.883), and care (0.831). Family appraisal consists of the challenge indicator (0.924) and stressors (0.706).

Table 2 shows the reliability test results of the model. The reliability test results can be seen from the Cronbach's Alpha and composite reliability values. The construct or variable is said to be reliable when the value of the composite variable > 0.7. The value of Cronbach's lpha > 0.6. (0.862), nurse factor (0.912), filial value (0.908), family appraisal (0.804), family ability (0.846) and child indicator (0.855) were all satisfied.

Table 3 shows the results of the hypothesis test. It is said that there is an influence if the value of variable T> 1. Based on Table 3, it can be seen that there is a significant influence between the family factors and filial value (T = 3.801), there is influence from the patient factor on caring ability (T = 2,504), there is an influence from the nurse factor on filial value (T = 6,590) family appraisal on nursing ability (T = 2.776), filial value on family appraisal (6,844), filial value on caring ability (T = 3.92)), and caring ability towards the child indicator (T = 3.82). An analysis of the test results of the model development can be seen in Figure 1.

The recommendations of the FGD results are as follows: (1) to increase family motivation in caring for children with leukemia by providing assistance to the family; (2) teaching the family to form positive coping methods when giving care to children suffering from leukemia; (3) to enhance communication between nurses and families to remind one another in terms of the actions that are always performed when caring for children with leukemia; (4) providing family health education on psychospiritual needs to increase family confidence in caring for children with leukemia; 5) preparation of guidelines for nursing interventions in providing assistance to the family for family empowerment in caring for children leukemia and (6) health education about specific things that must be known by the family when treating childhood leukemia that is easy to understand by the family. All of the results of this study were integrated into a module as a guide to improve family empowerment when treating childhood leukemia.

DISCUSSION

Family factors forming family empowerment

Family factors in the application of family-centered care are formed by the indicators of motivation, cognition, perceived threat, coping, social support, care receiver impairment, competing role demands, and caregiving activities. The family is the main source of the child's support when providing stability to children in times of childhood trauma. Family-to-family support can benefit the mental health status of the mothers of children suffering from chronic diseases (Academy, Pediatrics, & Care, 2018; Ireys, Chernoff, Devet, & Kim, 2015). Alhani et al (2003) explained that in order to empower families in improving optimal health, any response must involve the 3 dimensions of motivation, cognition, and the basic properties of the individual. Intrinsic motivation involves the positive and valuable experience that individuals derive directly from a task. Individuals try to motivate themselves by establishing confidence in the action that is to be taken, and planning the action to be realised. Motivation is needed to improve family empowerment when treating child leukemia.

Another dimension in the family factors that makes up family-centered care is cognition. Cognition, in this case, is the family knowledge of treating childhood leukemia. Knowledge is the result of knowing, and this occurs after the person senses a particular object. Sensing occurs through the human senses of the sense of sight, hearing, smell, taste, and touch. Much of human knowledge is obtained through the eyes and ears (Notoadmodjo, 2003). Knowledge can also be defined as the facts or information that we think is correct based on thoughts involving empirical testing (the thought of phenomena being observed directly) or based on other thought processes such as giving logical reasons or problem-solving (Hidayat, 2007). Family knowledge can provide information for the family to improve its ability to care for children with leukemia.

The perceived threat dimension (perceived threat) is also one of the basic family building factors involved in fostering empowerment. Families perceiving threats to the severity of the condition of childhood illness can be a matter of increasing the ability of the family to care for children with leukemia. Threats encourage individuals to take preventive or cure measures, but too much of a threat creates fear that impedes action by the individual feeling helpless (resigned). It supports this research that perceived threat (perceived threat) by the family is an indicator of the formation of a sense of empowerment in the family, in improving the ability of the families to treat childhood leukemia. Another indicator of empowerment is family coping. Family coupling in relation to treating patients with chronic disease is the family adaptation ability in the face of severe and long-term stressors (chronic) due to one family member suffering from chronic illness. According to Mc Cubbin (2001), when a family member suffers from chronic illness or disability, including mental disorders, the family should provide long-term care and must continue to support the patient to perform their daily routine activities.

Family support is the attitude, action, and acceptance of the family to its members. Family members are seen of as an integral part of the family environment (Friedman & Marylin, 2010). Family support is the verbal information, targets, real assistance or behaviour provided by people who are

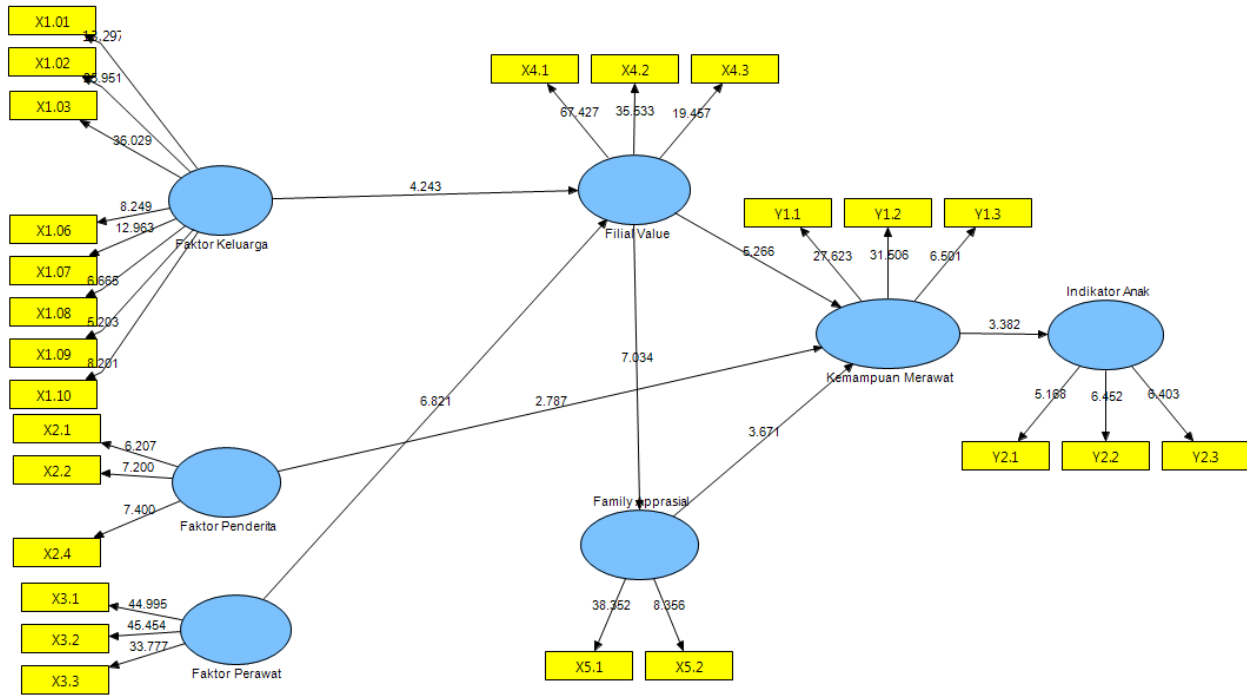

Figure 1: Analysis test results on the development of a model for family-centered empowerment on the ability of the family to care for children with leukemia.

familiar with the subject in their social environment or in the form of attendance and things that can provide emotional support or influence the behaviour of acceptance. Low social support is the support of families of people with chronic diseases that can affect individual behaviour, such as increased stress, helplessness and despair. These things ultimately reduce health status. Decreased health status means a decrease in the quality of life of the patient (Antari, 2013).

Caregiver demands is another dimension of family factors as an indicator of the formation of family-centered empowerment, consisting of care receiver impairment, competing for role demands, and caregiving activities. The demands of family care in this study were mostly in the moderate category, indicating that family reactions in providing care to children with leukemia are still complex. This is in accordance with the opinion of Given (1992) in that the family reaction to caring for sick family members is complex and may vary over time. The caregiver's reaction results from an effective assessment of the existing parenting tasks, the effort being made, the status or needs of the patient and the care environment. Age, gender, cultural background, ethnicity, socioeconomic status, educational level, personal health, and family dynamics work together as an integral factor in predicting caregiver reactions to demanding roles (Baider & Bengel, 2001; Hagedorn et al, 2000; Langer, Abrams, & Syrjala, 2003; Northouse et al, 2000). The results of Govina et al. (2015) also explain that the burden of family-perceived care is related to mood, the difficulty of parenting, family status, employment status and past experience. The nurturing burden that the family perceives in treating the child with leukemia becomes an intervention that should be done by empowering the family in order to increase their ability to caring for their child suffering from leukemia.

Patients factors forming family empowerment

Family-centered care is formed by the indicators of age and child status, the duration of treatment and the severity of the disease. The results of this study are consistent with the study by Pott & Mandleco (2012), who suggested that the experience of suffering from an illness is very confusing for children, especially for children who have cognitive development skills that are not enough to understand and help children to respond to stress. The presence of the stress of hospitalisation that occurs in children will affect the parents. Research by Franck et al. (2015) explains that the hospitalisation process causes stress for the elderly. Anxiety and depression in the elderly that occurs during hospitalisation is associated with negative coping mechanisms and post-traumatic stress symptoms.

If the child is sick, the parents also feel the pain experienced by the child (Wong, Hockenberry, Winkelstein, & Wilson, 2009). The well-being of the caregiver depends on the patient's condition and the individual characteristics of the caregiver (Weitzner et al, 1999). Families who care for children with leukemia should be able to know about the condition of their children so that the families are more vigilant in caring for children with chronic pain conditions.

Nurse factors forming family empowerment

The nurse factor in the application of family-centered care is formed by the indicators of empowering, enabling, and supporting. A nurse is a member of a health team working with both the children and their parents (Supartini, 2004). Florence Nightingale (in Priharjo, 2008) stated that a nurse is concerned with maintaining the patient's condition in response to the health problems that he or she is experiencing. According to Ellis & Hartley (1980, in Priharjo, 2008), a nurse is a person who cares for and protects the sick, elderly and wounded. A major focus in nursing services is the promotion of health and disease prevention in relation to family-focused and therapeutic care. The concept underlying the cooperation between the family and the nurse is that the nurse facilitates the family in remaining active in the nursing care of their child in the hospital and empowers the family's knowledge and skill related to the care of the child in the hospital (Supartini, 2004). Family-centered nursing explains that nursing skills are needed to provide family nursing care, thus enabling family members to achieve improved health of all family members. This leaves the families able to address health problems (Friedman & Marylin, 2010). This is in accordance with the results of this study, in that the nurse indicator becomes the determining factor in growing the family's basic values (filial value) so then the family can finally empower themselves in treating the child's chronic condition, in this case, leukemia.

Family-Centered Empowerment (family filial values) on family appraisal

The results of the statistical tests show that filial value (base value) as a form of family-centered empowerment significantly affects family appraisal (family assessment) in the ability to care for children with leukemia. Family filial values are indicators of the formation of empowerment within the family, which consists of the indicators of responsibility, respect and care. Empowerment is an ongoing process to improve people's ability and independence in improving their standard of living. The process is done by generating their empowerment, in order for them to improve their lives on their own strengths. Gibson defines empowerment as a social process; recognising, promoting and enhancing people's ability to find their own needs, solving their own problems and mobilising the resources needed to control their lives (Graves, 2007). Family empowerment is a mechanism that enables the transformation of the family capacity as a positive impact of family-centered nursing orders, health promotion measures and cultural suitability that influences treatment and family development (Graves, 2007). Empowerment is defined as the process of discovery and the development of the personal capacity to be responsible for their life because they have the necessary knowledge and resources to acquire and apply reasoned decisions and sufficient experience to evaluate the effectiveness of decisions (Masoodi et al., n.d).

The indicators of family appraisal formed in this study are challenges and stressors. The family assessed whether the treatment of a children with leukemia was a challenge or if it became a stressor for the family. Family disease assessment is defined as the family's trust when assessing and treating illness (Doherty, 2002). The family has an important role in the process of disease assessment and treatment. Family assessment establishes the value, purpose, and priority of the family members in response to disease.

The above supports the results of this study, in that the basic values of a family as a form of family empowerment can empower families further when providing a positive family appraisal.

Family-Centered Empowerment (family filial value) and the family ability to care for childhood leukemia

Family filial values as a family-centered empowerment builder significantly affect the ability of the families to care for children with leukemia. Filial values are the attitudes and beliefs about parental responsibility on the health of their children. Confidence and commitment to maintaining traditional values can influence the caregiver's motivation to provide care to their child. There are 3 dimensions in measuring filial value: 1) a sense of parental responsibility when caring for the child; 2) respect and admiration of the parents towards their children and 3) the desire of the parents to care for their children. These three dimensions of filial value are expected to: 1) alter how parents value the demands of parenting, whether as a challenge or stressor; 2) contribute to the resources available to overcome the sense of purpose and strong meaning associated with giving back to the parents; 3) influence access to family resources and the use of community resources and 4) indirectly affect the resource outcomes and assessments (Jones et al., 2011).

People are able to change previous behaviours and display their abilities according to the situational needs (Popp et al., 2015). The Calgary intervention in the cognitive domain is one of the enabling factors of behaviour formation. Knowledge and attitude also plays a role as a predisposing factor (Notoatmodjo, 2003). Knowledge of successful cancer treatment will bring out a response in the respondents in the form of a positive attitude. A positive attitude will be reflected in the individual's behaviour when applying the cancer treatment. The act of care from the families with good cancer treatment being conducted in the family is in line with the concept of cybernetics, and the ability to organise themselves through the feedback process. Intrapersonal systems can be seen in the feedback that occurs due to the behaviour of a person that influences and is influenced by the behaviour of another. Actions in family cancer care can also be influenced by the availability of the

facilities owned by the family and the family motivation in applying care.

The family's ability as an indicator of child health status

The results of statistical tests showed that the ability of the family significantly influences the indicator of child health status. The family's ability, in this study, includes the indicators of family care outcomes in relation to treating children with leukemia, which in consists of the indicators of perception about healthy, personal and family growth, and the existence of prosperous conditions. In this study, most of the respondents were in the medium category. The indicators of child health status in this study were the nutritional status of the child, the incidence of secondary infection, and the occurrence of bleeding. The results showed that most of the child health indicators were in the medium category. This indicates that the health indicators of children with leukemia can be seen from the increased ability of the families in treating children leukemia. Family ability in this study includes the indicators of family care which consists of perceived health, personal growth, and existensial well-being. The ability of families to care for children with leukemia increases in line with the increase in family appraisal when giving an assessment of themselves, in relation to caring for children with leukemia being a challenge for them, as they want to be able to do their best for the health of their child. Family-centered empowerment will improve the family's ability to provide an appraisal. Family-centered empowerment is the process of parental involvement to improve their ability to care for their child (Olin et al., 2010). The family's ability to care for a child with leukemia requires an effort by the health care provider so then the family's ability to care for their child with leukemia increases and the child's health indicators can be improved.

CONCLUSION

The family's ability to care for their child with leukemia can be enhanced by fostering a sense of empowerment. Family-centered empowerment can be maximised to improve their positive outcomes, which in turn will improve the indicator of health status in relation to the child with leukemia. Based on the results of this study, the family factors, patient factors and nurse factors have a direct influence on family empowerment (responsibility, respect, and care) when treating children with leukemia.

The existence of a sense of empowerment in the family can increase certain behaviours when doing a family appraisal of their ability to care for their child with leukemia. The importance of family appraisal has a role in the efforts undertaken to improve the ability of families to treat children with leukemia. This is evidenced by its role in facilitating family empowerment before establishing positive care outcomes. It is known that if the family filial values are strong, then it will affect the family appraisal so that ultimately, the ability of the family to care for their child with leukemia increases. Increased family ability will affect the child's health indicators.

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Original Research

Implementation of Discharge Planning in Hospital Inpatient Room by Nurses

Asmuji Asmuji[1], Faridah Faridah[2] and Luh Titi Handayani[1]

[1] Faculty of Health Science, University Muhammadiyah of Jember, East Java, Indonesia
[2] Bachelor of Nursing Program, Insan Unggul Health Science College Surabaya, East Java, Indonesia

ABSTRACT

Introduction: Discharge planning is still become a problem for health services in hospital in-patient rooms. Discharge planning commonly is only done when the patients leave hospital by giving them an explanation about the content of the controlling card. Discharge planning is a routine activity that must be done by nurses in order to give information to the patients about their condition and any actions can or should be undertaken by them. In fact, the importance of discharge planning is not yet balanced, nor effectively applied in field. This research was conducted to find out about the implementation of discharge planning by nurses in one of the hospital in-patient rooms at the hospital of study.

Methods: This research was a qualitative research study conducted with the phenomenological approach. The informants were 6 patients and 6 nurses in first, second and third class nursing wards. The instruments used in this research were the researchers themselves with interview guidance, field notes and a tape recorder. The data was collected through an in-depth interview.

Results: There were three themes found through the analysis, which were 1) the information dimension involving room orientation, rights and obligations, and patient health problems as the sub-themes; 2) the understanding dimension with knowing and understanding the discharge planning as the sub-themes; 3) the implementation dimension with the time of implementation and content of discharge planning as the sub-themes.

Discussion: Complete information given to the patients will bring about a positive impact, so then they can help themselves in relation to their curing time at home. A lack of and unclear information will bring about negative impacts such as mistakes when taking drugs, poor diet, neglecting activity while staying at home

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CONTACT

Asmuji Asmuji
asmuji@unmuhjember.ac.id
Faculty of Health Science, University Muhammadiyah of Jember, East Java, Indonesia

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INTRODUCTION

The important elements involved when providing health-care services to patients does not only focus on the adequacy of the infrastructure facilities that can be used as a mirror of quality services, but it is about the fulfilment of the rights of the patient from the beginning of entry until their discharge from the hospital. One of the inherent rights of the patients and their families when admitted to hospital for treatment is to get comprehensive information about their health when it comes to discharge planning. Delgado-Passler et al (2006) explained that discharge planning should be done comprehensively.

Discharge planning services are the responsibility of all health-care professionals in hospital, such as nutritionists, pharmacists, doctors and nurses, as the perpetrators of the 24-hour service that accompany patients during hospitalization. The discharge planning program is focused on providing health education to patients covering nutrition, activities or training, medicine and special instructions on the signs and symptoms of the disease that the patient has (Perry et al, 2006). Before discharge, patients and their families need to know how to manage their condition and/or recovery. Teaching the patients and their families is the duty of the nurses as part of an innovative strategy that is at the forefront of patient care (Bastable et al., 2002). Both patients and their families need a health-care system that enables them to meet their needs, facilitated by self-care services (Mullen et al, 2006).

The process of discharge planning is used to prepare the patient to leave the hospital (Goodman et al, 2013). Nurses have an importance role in discharge planning (Holliman et al, 2003; Sturdy et al, 2010; Kerr, 2012), so as it can reduce re-visits for patients (Jha et al, 2009; Bailey, 2012; Holland et al, 2012; Mathews et al, 2014; Goodman, 2016).

Patient discharge programs, also known as discharge planning, in hospitals must have standard operational procedures. This is so then each patient gets a discharge program of equal standard regardless of who gives it. Discharge planning that is not good can be one factor that prolongs the duration of healing at home. Patients are declared ready for discharge if the patient is aware of their treatment, signs of harm, activities that need to be performed, and can conduct follow-up care at home (The Royal Marsden Hospital, 2004).

An effective discharge plan should include an ongoing assessment to obtain comprehensive information about any changing patient needs, nursing diagnostic statements and extensive planning to ensure that the patient needs are met according to what healthcare provider they can access (Kozier, 2004). It can be said that discharge planning is a broad and complex process (Durstenfeld et al, 2014).

Field studies have found that a discharge plan can still become a problem for health services in hospital in-patient rooms (Kraft, 2013), where discharge planning is commonly only done when the patients leave the hospital by giving them an explanation about the content of the control card. Popejoy (2008) stated that bad discharge planning could cause serious consequences for the patient. The research done by Lindo et al (2016) at three hospitals in Jamaica showed that discharge planning was done 72 hours after hospitalization. Joanne (2006) stated that the nurses did not have the education and experience needed to provide complex health care to the patients.

MATERIALS AND METHODS

The design of this research was qualitative with a phenomenological approach, which aimed to dig into the subjective experiences presented and to gain better perspective awareness (Moleong, 2010) of the patients and nurses involved related to the implementation of discharge planning in the inpatient room of one of the hospitals. This research was conducted from March to June 2017. The population in this study were patients and nurses in class I, II, and III inpatient rooms. The informants of this research study were 6 patients/families and 6 nurses chosen via purposive sampling with the criterion being the that the patient was an adult aged 21 - 60 years old or a paediatric patient represented by a parent who accompanied them during the time in the hospital. The informants in the nursing element were chosen with the criteria that they had been working for at least one year in the hospital, had a diploma-level of education and that they were Ners-qualified. The determination of the number of samples or informants was that it should be between 5 and 25 people (Creswell, 2009). There were 6 people for each sample group (Mason, 2010), since the researchers obtained saturated data by the sixth informant. The research instrument was the researchers themselves, with the help of a question guide, field notes, and a video or tape recorder. The methods of data collection was an in-depth interview with a duration of time between 45 and 60 minutes. The data analysis of this research used the stages proposed by Colaizzi in 1978: 1) describing the phenomenon; 2) collecting the description of the phenomenon on based on the information submitted by the informants; 3) reading the entire description of the phenomenon obtained from the informants; 4) re-reading the transcripts, further reciting any significant statements; 5) attempting to decipher the meaning of each significant statement; 6) organising the set of meanings formed into groups of themes; 7) writing a complete and in-depth description; 8) returning to the participants to obtain validation of the description of the results and 9) validating the results of the analysis directly to the informants (Speziale et al, 2007). As an effort to protect the respondents from any violations of ethics, the research planning study was evaluated by the ethics team in addition to its' application in the field. The researcher gave an informed consent form to each candidate about the advantages, possible risks of the research, and kept the confidentiality of the respondent's name.

RESULTS

Informant Characteristics

The informants in this research were patients consisting of 6 people; 4 people of the female sex, and 2 male. The informant's age was between 19 and 60 years old. The education level of the informants consisted of elementary school students (4 people), senior high school students (1 person) and a university student (1 person). The treatment period is between 2-4 days. The nurses who were on duty at the time of the data collection amounted to 6 people. Out of the total, 5 people were female, and there was 1 male aged between 25-45 years.

Analysis Results

1. Patient Informants

The following questions were asked: "How was your experience while hospitalized here?" and "What kind of service do you want?"

After passing the recommended stages, then came the discovery of the themes of the analysis. The analysis results obtained the main theme and sub-themes as follows.

Table 1. Results of the interview analysis with the patient informants or the patient's family

Theme	Sub-theme
Information dimension	Room orientation Rights and obligation Health issues

Table 2. The results of the interview analysis from the nurse informants obtained two themes

Theme	Sub-theme
Knowledge dimension	Knowing of discharge planning About discharge planning
Discharge planning implementation dimension	Discharge Planning Time Content of discharge planning

Information Dimension

The results of the interviews with the patient informants or the family of the patients found a poor level of expression that led to incomplete information being received by the patients from their first time getting to the inpatient room until leaving the hospital. This certainly can cause the patients and their families to not understand what they should do during the treatment period. The information dimension consists of the sub-themes of room orientation, rights and obligations, and health issues.

Room Orientation

The interviews related to patient orientation and family orientation were found to have no spatial orientation upon first admission.

…I want, when I enter here, I get information where is my room directly (P1)
… in order to enjoy when get nursing care here, is needed to know the name of the room (P2)
…I never introduced before (P1, P3, P4, P5, P6)
…. if the information about the room yes ... I was not introduced (P1)
... the explanation of the room, there is no such thing, sir. (P3)
"Delivered here ... moved to bed, that's all" (P4)
"I just know the name of this room.... After my second days here (P5)
"My family got the wrong room .... because they did not know" (P6).

Patient Rights and Obligations while an In-patient

Keywords found in this sub-theme were:

I want to know what might be done (P3, P4, P5)
…I afraid to ask (P1, P2, P6)
I don't know, I only obey it (P1)
"The nurse only conveys to obey the rules to be obeyed" ..... but did not tell the rules (P1)...
.. it seems that there is taped-stick on the wall ...., but not explained (P2)...
... Afraid of mistaken, I am as villager mistakenly disobeying '(P6)

Health Issues Faced by the Patients

Keywords on the health issues faced by the patients were:

…….I want to know about my condition? (P2, P3, P4, P5)
"Nurses do not tell ... if they did not asked. they just told me"(P2)...
….they explain only when asked (P3, P4, P5)

2. Nurse Informants

The following questions were asked of the nurse informants: "How about your experience in discharge planning?" and "What kind of service that you want?"

Knowledge Dimension

The results of the interviews with the nursing informants obtained findings about the inappropriate discharge planning in place. Some of the nurses said that they did not know the term 'discharge planning'. If nurses do not know the term 'discharge planning', then they will automatically not be able to do it properly.

Knowing Discharge Planning

Keywords in this sub-theme were:

…What….discharge planning is? (P1)
…What Sir, because I've been one year here (Nurse1)
…Not yet, sir because I've been only one year here (Nurse 1)
…I know a little, if not mistaken when I was in college, but now I forget it, sir (Nurse 5)

About Discharge Planning

Keywords in this sub-theme were:

..... I don't really understand. What I know is that it is the plan for the patient going home (Nurse 2, Nurse 3)
"I did not know about discharge planning ... Is it a kind of resume nursing? (Nurse 5)

Implementation Dimension

The results of the interviews with the nurse informants about the implementation of discharge planning led to the discovery of discharge planning not being as suitable as it should be. The implementation dimension obtained two sub-themes, namely implementation time and discharge planning content.

Discharge Planning Time

Keywords in this sub-theme were:

…yes…when the patients get permission to leave the hospital (Nurse 2)
..... When the patient has been discharged from the hospital (Nurse 2)
..... Patients who will go home, right sir? (Nurse 1)
"I do it when the patient wants to go home, not at other times" (Nurse 4)
..... give it only when the patient will go home (Nurse 3)
"If that's usually done when taking-over, sir" (Nurse 5)"
I once gave discharge planning when the patient was going home..." (Nurse 6)

The Contents of Discharge Planning

Keywords in this sub-theme were:
... The contents of discharge planning are just about drugs and control dates only ... (Nurse 1)
... Which must be done are call the patient, give the drug schedule, home care, schedule control, risk prevention and diet (Nurse 2)
"Control schedule, take-home medicine, time for control, how to go home" (Nurse 3)
The activities are….related with explanation about giving medicines, control date, day and control time…like that (Nurse4)
"Its activities are related to drug administration, control dates, days and hours of control" (Nurse 4)

DISCUSSION

Information Dimension

The results of this research are based on in-depth interviews with the informants, which indicate some problems in the discharge planning performed by nurses. The informant stated that at first admission, they were not given an explanation of the room where they were to be hospitalised and an explanation of their rights and obligations as the patient. The explanation about the patient's health problem was done by the nurse when asked by the patient or family. The discharge time, according to Berry et al (2014), was the transitional time usually experienced by the patients regarding some of the problems in understanding the instructions.

Whereas, before discharge, the patients and families must know how to manage their condition at home. Teaching the patients and their families is the duty of the nurses as an innovative strategy that is at the forefront of patient care (Bastable et al., 2002). The patient and their family needs a care system for health that allows them to meet their own care needs (Mullen et al, 2006). Thus, the method of re-teaching (Sawin et al, 2017) should always be done by the nurse. Brooten et al (2002) demonstrated that the teaching should begin as soon as possible during hospitalisation and frequently repeated to ensure the success of patient learning.

Information is the data that has been processed into a form that has meaning for the recipient and is useful for current or future decision-making (McLeod et al, 2001). In the activity of providing nursing care, information for the patients is needed from the beginning of them becoming an inpatient up to the time of discharge. Thus, the discharge planning should begin as soon as possible after the patient is admitted to the inpatient unit (Haber, 1992). This process can help the patients achieve stable health at home, a smooth recovery, and to see improvement in their quality of life (Backer et al, 2007).

The information needed at the beginning of hospitalisation is not only about the patient's health condition, but also information about the room and hospital where the hospitalisation takes place. The provision of early information about anything related to hospitalization can be useful to building the trust between nurses and patients. Simple, clear, and informative information will give the patients and their families an understanding of the hospital and hospitalisation, their health condition and their rights and responsibilities. The provision of information will also improve patient compliance and reduce errors during inpatient care, and later, their time of recovery.

The adherence of patients to the medical advice provided is also strongly influenced by the important role of health communication. There are two things that affect the patient's compliance with accepted medical advice, namely that the patient must first understand the health issues or health problems faced. For that, he must be able to interpret and understand all of the health information communicated by the medical personnel on him. The patient should be able to remember (and memorise) the medical advice provided. When communicating information about the health of the patient, the medical experts should not use medical terms that are difficult to understand and ensure that the information provided is not too complicated. That way, the patient can easily recall all of the health information (medical advice) that has been submitted for him. For example, how many doses for each drug and so on (Rahmadiana, 2012).

The provision of incomplete and unclear information will affect the patient's understanding of their condition. The impact is the mistakes involved from acting, behaving and making decisions based on misunderstanding. This is certainly very dangerous for the life and health of the patients. McBride (2002) said that the failure to communicate health information to patients and their families could result in the patient's lack of understanding of the outcomes of the tests (Rahmadiana, 2012).

Providing incomplete and unclear information could have an influence on the patients' understanding about their condition. Discontinuity in providing information could cause health results that are worse (Wang et al, 2008). This condition is very dangerous for the patient's health and their life. Rahmadiana (2012) stated that failure to communicate the health information to the patient and their families can cause the patients to misunderstand their test results.

Providing suitable health information is an important part of disease prevention and health promotion. Health communication is also considered to be relevant to several contexts in the field of health, including 1) the relationship between medical experts and patients; 2) the reach of individuals in accessing and utilising health information; 3) individual compliance with the treatment process that is to be followed and compliance with advice on the medicines received; 4) conveying health advice and health campaigns; 5) the dissemination of information about health risks to individuals and the population and 6) an overview of health profiles in the mass media (Rahmadiana, 2012).

The value of information that is closely related to the decision to be made, whereas if there is no choice or decision, then information will not be required. Decisions can range from simple recurring decisions to long-term decisions (Alandari, 2013). Incomplete health information may cause patients and their families to be incorrect in making decisions, whether they are taking medication, working on a set diet and other allowable or prohibited actions.

Communication between the patient and nursing staff is a key component of effective health care and lays the foundation for a safe and comfortable nursing environment (Williams et al, 2001). McCormack, (2003) also underscored the importance of patient-centered communication functions. With this in mind, it is important for the nursing staff to take part in planning the discharge of patients to communicate useful information. This is as well as fostering the attitude of sharing knowledge, experiences, hopes and concerns to resolve and describe the work routine for discharge planning.

Health information is not only addressed to the patients. Their families are a part of the inseparable environment of the individual, and have a very important role in realising the individual's health and them being someone who needs emotional support, education, and follow up (Purdy et al, 2015). The family as a support system should always be involved in efforts to solve health problems in individuals. The Medical Mutual of Ohio (2008) stated that patients and all of their family members should be informed of all discharge plans. Smith et al (2013) said that the provision of information to the patients and their families enables them to focus on discharge planning.

Dimension of the Nurse's Knowledge on Discharge Planning

The results of the interviews with the nurse informants found surprising data, as there were informants who said that they were not familiar with the term discharge planning. As a nurse, the term discharge planning should not be a strange thing. How can a nurse perform the activities related to discharge planning correctly, if they do not know the term? Knowing something is the first step to action. A deeper introduction enables a person to understand, and if it is already understood, then they can act or apply it.

Sparbel et al (2000) stated that the problem of understanding related to a better health care continuity could help to ensure the delivery of high quality of health care services for all patients. The problem about the lack of nurses' knowledge related to discharge planning is not only happening in Indonesia, but also occurs in other countries. Chaboyer et al (2002), in a survey of 58 nurses working in an intensive care unit, obtained that 43% lacked an understanding of return planning processes, and only 14% stated that the doctors trusted them enough for the nurses to plan the discharge. 14% stated that the doctors had given enough referrals for the nurses to design the discharge planning.

Dimension of Discharge Planning Implementation by the Nurses

Discharge planning for patients should be made from the beginning of their admission to the hospital (Rudd et al, 2002). Some research results abroad also showed the same information. Goodman's (2010) study obtained data from nurse respondents stating that the patient's discharge planning should begin at the pre-admission clinic or when they are admitted to the hospital. Morris (2012) also obtained data stating that nearly 80% of respondents agreed that the planning for at-home patients should be started upon their entry to the health care unit. Watts et al, (2005) found from most of the notations in their study that discharge planning was initiated from admission when the patients hospitalized up until they were discharged.

Based on the data above, the planning of patient discharge is not only done when the patient is in the process of being discharged, but Haber (1992) said that it must be done from the beginning when the patient goes the treatment room. It can be said that discharge planning starts from the orientation of the room, an explanation of the rights and obligations of the patient, when conducting a comprehensive assessment, formulating the nursing diagnosis correctly, creating an appropriate nursing plan, performing the planned nursing actions, and evaluating both short and long term treatment plans.

However, looking at the above interview results leading to the timing and content of the discharge planning, it was found that the nurse's understanding of discharge planning was lacking. The nurse informant said that the implementation of discharge planning is the time before discharging the patient, while the content is to provide an explanation of the contents of the control card. Chaboyer et al. (2004), in his research, found that 54% of nurses stated that the implementation of discharge planning was conducted just before the patient leave the service unit. There is concern, as many nurses do not know how to do discharge planning properly.

The implementation of discharge planning information that is important to be delivered to the patient is the possibility of the date of discharge (Lees et al, 2006; Rudd et al, 2002). The provision of this information at the treatment time will be able to provide them with motivation and the spirit to heal. Morris (2012) stated that it is important to remember that most patients want to know how long they are likely to remain in the hospital. But the reality is different, according to Lees (2003), who said that where the patient is not always given information about the possible date of discharge, their motivation was lower.

The implementation of discharge planning in health services in this research area could not be released from the control card. This can be seen from the results of the interviews that say when talking about discharge planning, then in the mind of the nurse, the purpose is to give and explain the control card to the patient. There was even a nurse informant who said that they gave the control card without any explanation of its contents. Kozier (2004) stated that discharge planning is a starting process of the patient to getting health care, followed by a continuity of care, both in the process of healing and in maintaining their health status until the patient feels ready to return to his environment.

The discharge planning in health services that is still not understood by most of the nurses has become homework that must be completed soon. This fact is not only the responsibility of the nurses, but it should be the joint responsibility of various parties, including the management of the health services and hospitals. Hospital policy related to discharge planning must be enforced, by making standard operating procedures (SOPs). The Department of Health (2010) said that hospitals should make and distribute guidance about the patient discharge planning process. The policy, coupled with a SOP for discharge planning, will strengthen the position of its implementation. Rudd et al (2002) also noted that the nurses should be pushed into being more active in performing patient discharge planning based on the given standard.

CONCLUSION

The implementation of discharge planning in one of the hospital's inpatient rooms in Jember found that the results led to incomplete information being received by the patients from the first time entering the inpatient room up to leaving the hospital. Another finding is that there are nurses who are not familiar with the term discharge planning, and who do not understand about the implementation of discharge planning both in terms of time and the content. Based on the conclusions above, the researchers have suggested that the management develop the human resources side of nursing by conducting socialization and discharge planning training. In addition, management should issue a policy in the form of a decree on the implementation of discharge planning and standard operational procedures (SOPs).

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Original Research

Predictors of Mortality among Patients Lost to Follow up Antiretroviral Therapy

Putu Dian Prima Kusuma Dewi and Gede Budi Widiarta

STIKES Buleleng, Bali, Indonesia

ABSTRACT

Introduction: The death of HIV/AIDS patients after receiving therapy in Bali is the seventh highest percentage of deaths in Indonesia. LTFU increases the risk of death in PLHA, given the saturation of people with HIV taking medication. The level of consistency in the treatment is very important to maintain the resilience and quality of life of people living with HIV. This study aims to determine the incidence rate, median time and predictors of death occurring in LTFU patients as seen from their sociodemographic and clinical characteristics.

Methods: This study used an analytical longitudinal approach with retrospective secondary data analysis in a cohort of HIV-positive patients receiving ARV therapy at the Buleleng District Hospital in the period 2006-2015. The study used the survival analysis available within the STATA SE 12 software

Results: The result showed that the incidence rate of death in LTFU patients was 65.9 per 100 persons, with the median time occurrence of 0.2 years (2.53 months). The NNRTI-class antiretroviral evapirens agents were shown to increase the risk of incidence of death in LTFU patients 3.92 times greater than the nevirapine group (HR 3.92; p = 0.007 (CI 1.46-10.51). Each 1 kg increase in body weight decreased the risk of death in LTFU patients by 6% (HR 0.94; p = 0.035 (CI 0.89-0.99).

Conclusion: An evaluation and the monitoring of patient tracking with LTFU should be undertaken to improve sustainability. Furthermore, an observation of the LTFU patient's final condition with primary data and qualitative research needs to be done so then it can explore more deeply the reasons behind LTFU.

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CONTACT

Putu Dian Prima Kusuma Dewi
✉ dian_pkd@yahoo.co.id
STIKES Buleleng, Bali, Indonesia

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INTRODUCTION

The epidemic and mortality rate of human immunodeficiency virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) infections are still a global health problem. Globally, with the presence of antiretroviral (ARV) therapy, new infections and deaths are reported to have declined up to 2011 by 86% and 18%, respectively. Contrary to the ARV coverage, only 50% were treated and mostly adults were at a loss to follow up (LTFU). This condition indicates a gap in the access to antiretroviral therapy (UNAIDS, 2013a). The retention rate for people taking antiretroviral therapy (ART) has declined over time, from about 86% at 12 months to 72% at 60 months (UNAIDS, 2013a).

The death of HIV / AIDS patients after receiving therapy in Bali is the seventh highest percentage in Indonesia. This figure is still below the national death rate (18.04%), but is still far from the target of zero AIDS-related deaths (ASEAN, 2011). The number of cumulative AIDS cases in Bali is 4,261, with Denpasar City having the highest number 2,113 (49,59%), second the Regency of Buleleng 593 (13,92%), and third, the Regency of Badung 550 (12,91%) (Kemenkes RI, 2014). The data shows Buleleng District as the second highest district for HIV / AIDS cases in Bali with a higher cumulative number of LTFU patients compared with Denpasar and

Badung regencies, at 211 (26.08%) out of 1394 PLHAs with ARV therapy up to November 2013. This occurs considering that the area of Buleleng is large with limited access to therapy. It is only available in Singaraja Town, namely RSUD Buleleng. Buleleng is a high spot for HIV/AIDS cases with considerable access, such as to the Gerokgak and Sawan sub-

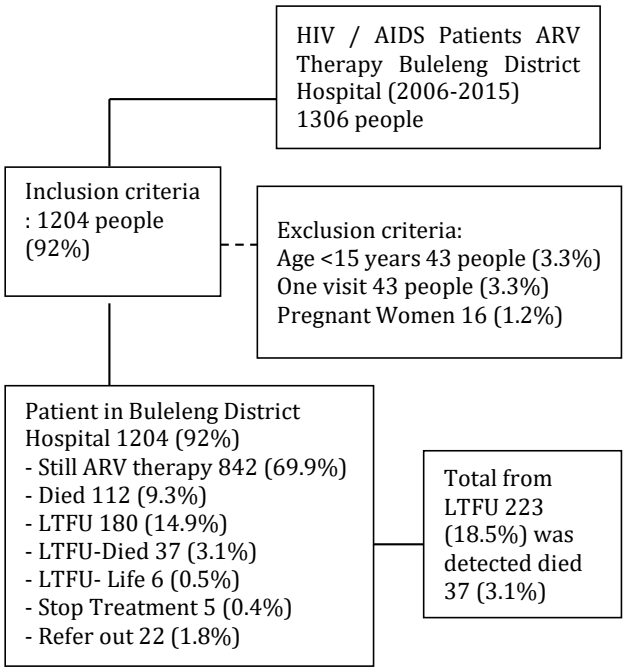

Figure 1 Flow chart of Respondents

districts (www.bulelengkab.go.id). The limited access make conditions and the discipline level of PLHA sufferers become strategic points that need to be studied, with the intention of reducing the risk of death and LTFU of PLHA.

ARV therapy requires high adherence and monitoring to suppress viral replication, to improve immunology and clinical outcomes, to reduce the risk of ARV drug resistance, and to reduce the risk of HIV transmission (WHO, 2013). The level of consistency and adherence of PLHAs remains a problem in Indonesia, including Bali where there is a good HIV prevention program. However, little is known about the predictors of death in LTFU patients.

Data related to the death rate of LTFU patients has not been reported on yet, although the data is important in order to know the last condition of LTFU patients while they are undergoing therapy. Death is the most common reason recorded for 233 (47.94%) of those experiencing LTFU (Wubshet et al, 2013). LTFU increases the risk of death in PLHAs (Alvarez-Uria et al, 2013). LTFU incidence continues to increase every year, given the saturation of PLHAs consuming drugs. The level of consistency in treatment is very important to maintain the resilience and quality of life of PLHAs. The incidence of LTFUs in patients receiving antiretroviral therapy varies, according to several studies other countries indicating that the longer the antiretroviral therapy is received, then the incidence and percentage of LTFU is also greater (Kate et al. 2014; Mugisha et al., 2014). Studies in African, European, American and Asian countries reporting on the predictors of death in HIV/AIDS patients still show inconsistent results in relation to some of the variables. These variables include age (Alvarez-Uria et al., 2013), gender (Odafe et al., 2012) and medication companion (Lamb et al., 2012).

Longitudinal research is important to determine the success of the ARV therapy programs that have been taking place. The LTFU indicator of the health facility setting of government hospitals is generally less than optimal for outreach programs, compared to private clinics. Most of the population are local residents. This research is expected to identify the predictors of deaths in LTFU patients undergoing ARV therapy in the general population in Bali, especially Buleleng District, which has not been done previously. This study will later contribute to practitioners and program holders on monitoring and evaluating the success of ARV treatment of PLHIV patients, especially in government hospitals.

MATERIALS AND METHODS

This study aims to determine the incidence rate, median time and predictors of death occurring in LTFU patients as seen from the sociodemographic and clinical characteristics. The method of study was an analytical longitudinal study with retrospective secondary data analysis in a cohort of patients receiving ARV therapy at the District General Hospital of Buleleng District from 2006 to 2015. This study used secondary data from the medical records of PLHA patients receiving ART and ARV registers contained in the VCT Polyclinic of Buleleng Hospital. Surveys via telephone and home visits were made for special patients with LTFU accompanied by field officers from NGOs. The survey aimed to check on the status of the LTFU patients recorded in the medical record, so that then we could more accurately know the person's last condition (outcome) such as death, still live or loss. The extracted medical records, used as the study sample, were the patients receiving ART in the period January 2006 to December 2015.

The first step taken before the data extraction was to complete the permit application sent to the Buleleng District Hospital. The first step involved was to draw up a permit for research in Buleleng District Hospital, including the recommendation of research to the National Unity and Politics Board Buleleng District and the Ethical Clearance process of the Ethics Commission Faculty Of Medicine Udayana University/Sanglah Hospital Denpasar. The number-letter of the permit for research in Buleleng District Hospital is No: 070/1958/SDM/VI/RSUD/2017, the number of recommendation from the National Unity and Politics Board Buleleng District is No.070/279/BKBP/2017 and the number of the ethical clearance was No.2611/UN.14.2/KEP/2017.

The data as shown in the figure 1 was collected by extraction from the medical records and the ARV registers of each PLHA antiretroviral period from 2006 to December 2015 at the VCT service Edelweies Buleleng District Hospital, to form the inclusion criteria. Next, the data was written in hard copy form and then made into a soft copy (in the form of Microsoft excel).

This research study was conducted in the VCT Eldeweies clinic of Buleleng District Hospital from

April 2017 to November 2017. The dependent variable was death in LTFU patients who had undergone ARV therapy with the event date as the date or month of the last visit of the LTFU patient declared dead through the data on their medical records, ARV registers and survey results (tracking) via telephone and home visits. The independent variable consisted of their sociodemographic and clinical characteristics. The characteristics of sociodemography consist of age, sex, work status and if they were a drug conservator (PMO). The clinical characteristics included their CD4 cell count, WHO stage, type of NRTI ARV, and NNRTI ARV type. The total population in the study up to July 31, 2014 was 1,013 patients. This population was limited via the inclusion criteria to HIV/AIDS patients receiving ARV therapy under LTFU. The exclusion criteria established in this study were pregnant women, <15 years of age and non-random identities.

The study will be limited to a specific timeframe from 2006 to 2014, and the recruitment of the study subjects was performed early with those receiving antiretroviral therapy as the baseline (initial observation). Based on the large sample calculations, some of the most commonly found variables had links with those who had died in LTFU. It showed a minimum sample of 70 people with assumptions on the dead group (70 exposed groups) and the non-dead (control group) group of 70 people. However, the sample to be used in this study consisted of all of the samples that met the inclusion criteria; as many as 1,204 patients with 223 patients included in LTFU so then the minimum sample size was met. All of the samples used were with consideration to the use of the secondary data to avoid incomplete data being available. Consideration needed to be given as to the use of a larger sample. The samples used in the study met the inclusion criteria bearing in midn the consideration of avoiding incomplete or missing secondary data.

The secondary data was in the form of a cohort of LTFU patients receiving ARVs in the 2006 to 2015 period recorded in the medical records. The primary data was obtained through survey results (home visits and via telephone), assisted by field officers to determine the condition of the patients with LTFU. All of the samples that met the inclusion criteria were included as the study sample. This selection was done not to reduce the strength of research due to missing data that can be found in the patient's medical record but so then the missing data was not focused on the same variable in each patient. Patients who had started ARV therapy and met the inclusion criteria were included as the study sample.

The analysis conducted in this study used survival analysis, using STATA SE 12 software. Univariate analysis was used to obtain the incidence rate of death rate per 100 person according to a years and hazard ratio, in addition to the median time of LTFU occurrence from the beginning of the year of the patient using ARV until the end of the observation year. The bivariate analysis resulted in a p value and survival rate that was used to see the significance of the differences between the respective groups. The value of the crude Hazard Ratio (HR), p specific, and p of HR crude from each independent variable to LTFU were performed using Cox Proportional Hazard Modified with a 95% confidence level. The parm test was used when the nominal independent variable was for three or more categories and we used a test for the trends when the ordinal data or intervals were in two or more categories.

Multivariate analysis with Cox Regression with the chosen selection method used was the backward method where one by one, the insignificant variables were removed from the model until the final model was obtained. The proportional hazard test was performed on the last multivariate model which aimed to check the proportional model produced when the model was said to be proportional, with a p > 0,05.

RESULTS

The results achieved from this study in accordance with the research objectives were as many as 1,306 patients treated in the period 2006 to December 2015. The data recorded until December 2015 descriptively analysed as many as 223 people (18.5%) patients with LTFU. The results of the study through the ARV registery data and the survey conducted together with the field officer found that LTFU patients who died was as many as 37 people (3.1%), LTFU without further information was 180 people (14, 9%), and detected LTFU patients who were still alive but did not continue their treatment was as 6 people (0.5%). The data obtained was then input into the Excel form in accordance with the predetermined variables for subsequent analysis using the STATA SE 12 software.

The number of patients on antiretroviral therapy in Buleleng District Hospital from 2006 up to

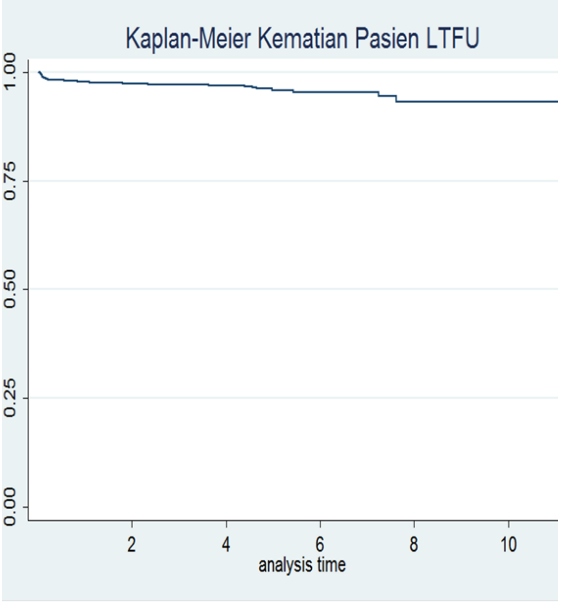

Figure 2 Kaplan Meier Graphic of LTFU Patient Death

Table 1. Sociodemographic and Clinical Characteristics of Died in LTFU Patients and No Died in LTFU Patients

Sociodemographic	Died in LTFU Patients (N=37) n(%)	Not Died in LTFU Patients (N=1167) n(%)	Total n(%)
1	**3**	**2**	**4**
Median of Age (IQR)*	33 (30-38)	31 (27-37)	31(27-37)
Sex			
Female	13 (2.9)	433 (97.1)	446 (100)
Male	24 (3.1)	734 (96.8)	758 (100)
Adherence support			
Yes	30 (2.9)	1002 (97.1)	1032 (100)
No	7 (4.1)	165 (95.9)	172 (100)
Fungtional Status			
Bed	8 (2.3)	334 (97.7)	342 (100)
Ambulatory	19 (3.8)	475 (96.1)	494 (100)
Working	9 (3.5)	245 (96.5)	254 (100)
NRTI			
Tenofovir	11(5.5)	191 (94.5)	202 (100)
Stavudine	5 (5.4)	87 (94.6)	92 (100)
Zidovudine	21 (2.3)	881 (97.7)	902 (100)
NNRTI			
Evapirens	12 (4.1)	277 (95.9)	289 (100)
Nevirapine	25 (2.8)	881 (97.2)	906 (100)
WHO Stage			
Stadium 1 & 2	8 (3.7)	206 (96.3)	214 (100)
Stadium 3 & 4	27 (3.2)	811 (96.8)	838 (100)
CD4	26 (17-50)	65(23-165)	64.5 (23-164.7)
Weight	47.5 (38.5-55)	50 (45-57)	50 (44-55)

* test normality spahiro-wilk not normally distributed so used median (IQR)

December 2015 was 1,306 people. The number of samples meeting the inclusion criteria were 1,204 people (92%) who received therapy and had a minimum of two visits, while those not meeting the inclusion criteria consisted of 43 people (3.3%) with one visit, 16 people (1.2%) who were pregnant an 43 people (3.3%) under the <15 years old. The characteristics of the study subjects were described based on their sociodemographic and clinical characteristics. The sociodemographic and clinical characteristics was the data collected at the beginning of the observation. The related descriptions of the sample's characteristics have been presented in tabular form, comparing the LTFU patient's death to each characteristic as in Table 1.

The number of PLHAs experiencing deaths in LTFU patients in Buleleng District Hospital was 37 people (3.1%). The incidencerate of death in LTFU patients was 65.9 per 100 people with a median time (50%) occurrence of 0.2 years (2.53 months). More than half of the respondents earned less than 2.4 million rupiah per month; 55.3% in the intervention group and 57.3% in control group. In terms of the relationship with the students, both groups were almost similar in that the respondents were taking care of their biological children, with the data showing 89.3% in the intervention group and 90.3% in the control group respectively

Kaplan Meier's analysis in Figure 2 above shows that for all of the PLHAs receiving antiretroviral therapy, 50% were at risk of death among the LTFU patients in the first year of therapy or around 2.53 months. This can be seen from the curve drawing of the median time for observation

Bivariate analysis of the nine variables at the beginning of observation in the table 2 showed that only two of the variables, weight and the group of NRTIs (zidovudine), were statistically related. Each 1 kg increase in weight reduced the risk of death in the LTFU patients by 6% with HR = 0.94; 95% CI 0.89-0.99; p = 0.02). Patients taking zidovudine-type ARVs reduced their risk of death in LTFU patients with HR = 0.32; 95% CI 0.15-0.69; p = 0.01). HIV-positive people who did not have a PMO were 1.57 times more at risk than those with a PMO (HR = 1.57; 95% CI 1.01-2.45; p = 0.045). Furthermore, HIV-positive people who did not have a PMO were of the male gender 1.1 times more than the average, their functional status being ambulatory was 1.37 times greater and had a 1.47 times greater chance of death, but statistically, it showed no meaning.

Multivariate analysis was needed to look at the most powerful and significant relationship to death among the LTFU patients concerning several variables related to the bivariate analysis. The variables included in the multivariate analysis were the variables having p <0.25 and the correlated variables found through the reference studie,s which were age, body weight, gender, medication control, Cd4 level, clinical stage, NRTI class and NNRTI group.

Table 2. Predictor of Death in Loss to Follow Up Patient

Variable		crude HR	95 % CI	p	aHR	95% CI	p
1	2	3	4	5			
Median of Age (IQR)*		1.02	0.98 -1.06	0.175			
Sex	Female	1.00 (reff)					
	Male	1.1	0.56-2.17	0.76			
Adherence support							
	Yes	1.00 (reff)					
	No	1.37	0.60-3.14	0.44			
Fungtional Status							
	Bed	1.00 (reff)					
	Ambulator	1.37	0.60-3.13	0.45			
	Working	1.47	0.56-3.81	0.43			
NRTI							
	Tenofovir	1.00 (reff)					
	Stavudine	0.70	0.23-2.12	0.53			
	Zidovudine	0,32	0.15-0.69	0.01*			
NNRTI							
	Nevirapine	1.00 (reff)			1,00(ref)		
	Evapirens	1.37	0.86-3.49	0.118	3.92	1.46-10.5	0.01
WHO Stage							
	Stadium 1 & 2	1.00 (reff)					
	Stadium 3 & 4	0.83	0.37-1.84	0.66			
CD4		0.99	0.99-1.00	0.43			
Weight		**0.94**	**0.89-0.99**	**0.02***	**0.94**	**0.89-0.99**	**0.035**

*p-value <0.25

Before doing the multivariate analysis, a collinearity test was conducted in order to know the effect of multi-collinearity. Collinearities can be discovered if there is a variable that has a correlation coefficient of more than 0.6 (r> 0.6), which means that there is a strong correlation between the variables (Sugiyono, 2011). In this analysis, there were no variables having a correlation> 0.6, so all covariate variables that met p <0.25 could be included in the multivariate analysis.

Certain types of NNRTI-class antiretroviral evapirens have been shown to increase the incidences of death in LTFU patients 3.92 times greater than that of nevirapine (HR 3.92; p = 0.007 (CI 1.46-10.51). Each 1 kg increase in body weight can reduce the risk of death in LTFU patients by 6 % (HR 0.94; p = 0.035 (CI 0.89-0.99)

DISCUSSION

The incidence rate of death in PLHAs experiencing LTFU within nine years at RSUD Buleleng was 65.4 per 100 people. This incidence rate is higher than that of 34.6 per 1,000 people over a period of five years (Bekolo et al., 2013). The risk of death in LTFU patients was 20 times higher than that of out-patientss (aHR 22.03; 95% CI 20.05-24.21) (Cornell et al., 2014). The incidence rate in this study was lower compared to the TAHOD data covering 18 sites in the Asia Pacific region of 21.4 per 100 PY, but it was higher than the rate in Southeast Asian countries such as India (7.1 per 100 PY) and Vietnam (8.9 per 100 PY) (Zhou et al., 2012; Alvarez-Uria et al., 2013; Tran et al., 2013). Similarly, it can be compared with developed countries that tend to have lower incidence rates such as France (4.3 per 100 PY) and Europe (3.272 per 100 PY) (Lebouche et al., 2006; Mocroft et al., 2008). This difference is also due to the different cut-offs in defining LTFU i.e. one year from the last visit. A comparison with countries in Africa with the same cut off (≥ three months from the last visit) showed that the incidence rate for the findings in this study were lower, at 25.1 per 100 PY (Western Kenya) (Ochieng-Ooko et al. 2010), 51.1 per 100 PY (Guinea Bissau) (Hønge et al., 2013) and 94.6 per 100 PY (Cameroon) (Bekolo et al., 2013).

The results of this study indicate that the LTFU patient death predictor that is statistically related to LTFU is NNRTI weight and the group of evapirens. Weight is a common reference used to assess nutritional status. LTFU PLHA deaths increased with a weight of 45 kilograms (Somi et al., 2012). People with HIV who start ARV therapy with a higher body weight will have a better health conditions. PLHAs with this condition tend to retain ARV therapy because they have benefited from the therapy. People with HIV who start therapy weighing less than 45 kg are more at risk of death and attrition. Losing weight> 10% is a common symptom experienced when infected with HIV (Dalal et al., 2008).

Other health conditions that can be used as a measure other than weight is BMI (body mass index). BMI (body mass index) ≤ 18.5 kg / m2 indicates poor health condition that may decrease the patient's

confidence in therapy so that LTFU is greater (aHR 1.51; 95% CI 1,23-1,87), supporting also the incidences of oral candidiasis with a low BMI (HR 1.36 95% CI 1.02-1.82) (Hønge et al., 2013; Evans et al., 2013). In contrast, the increase in the BMI of each person decreased the incidence of LTFU (aHR, 0.97, 95% CI 0.88-1.03) but did not otherwise show a significant relationship. Predictors among LTFU patients included BMI <17.5 (HR 2.4; 95% CI 1.8-3.1) (Fox, Brennan, Maskew, MacPhail, & Sanne, 2010). This is in line with the Ethiopian study which stated that PLHAs who weighed ≥60 kg had a 76% lower risk for LTFU than those with a weight <40 kg (AHR 3.47 95% CI 1.02-11.83). Those with a normal weight had confidence in their treatment and maintained it well (Haile & Mekelle, 2014).

The ARV regimen consists of nucleoside reverse transcriptase inhibitors (NRTIs) and non-nucleoside reverse transcriptase (NNRTI). Groups that include the NRTI regimen are zidovudine (AZT), stavudine (d4T), lamivudine (3TC), didanosine (ddl), abacavir (ABC), tenofovir (TDF) and emtricitabine (FTC). The NNRTI regimens are nevirapine and efavirens. There is also a second line of protease inhibitor (PI) regimens such as lopinavir or ritonavir. ARV regimens related to drug characteristics, side effects and easy access to ARVs have an impact on the adherence of PLHAs (MoH RI, 2011a). Research conducted in Cameroon said that the use of the NNRTI nevirapine (NVP) regimen significantly reduced the risk of LTFU (aHR 0.75 CI0.57-0.99 p = 0.04), as well as on the use of the stavudine NRTI regimen (aHR 0.55 CI 0.42- 0.71) and zidovudine (AZT) (aHR 0.59 CI 0.45-9.77) (Bekolo et a, l., 2013). In contrast to studies in Ethiopia, the use of AZT increases LTFU risk by three times compared to the d4T regimens (Haile & Mekelle, 2014).

HIV-positive people who received a substitution of their antiretroviral regimens during the treatment period were at a greater risk of LTFU (HR 5.2, 95% CI 3.6-7.3). This is similar to studies in India who reported that substitution could be a risk factor for ART failure (Alvarez-Uria et al., 2013; Berheto et al., 2014). The majority of regimen substitution cases are caused by drug reactions, such as when patients may become concerned about the side effects and effectiveness of the new drugs.

CONCLUSION

The correct and complete recording of patient addresses and phone numbers, and reviewing the patient relationship with their PMO, was the most important part of recording for tracking purposes related o patient absence during scheduled visits. An evaluation and the monitoring of patient tracking with LTFU should be undertaken to improve sustainability. Furthermore, an observation of the LTFU patient's final condition with primary data and qualitative research needs to be done so then it can explore more deeply the reasons behind LTFU. This is to know how to anticipate LTFU. Observation time with the secondary data also needs to be added to better know the success of therapy.

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Original Research

Factors Correlated with the Intention of Iron Tablet Consumption among Female Adolescents

Riri Aprianti[1], Gadis Meinar Sari[1] and Tiyas Kusumaningrum[2]

[1] Faculty of Medicine Universitas Airlangga, Surabaya, Indonesia
[2] Faculty of Nursing Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Introduction: Anaemia in female adolescents tends to have a negative impact that is likely to later arise in pregnancy, labour and childbirth. The prevalence of iron deficiency anaemia in female adolescents in Indonesia is thirty percent. Indonesia runs an iron tablet program for female adolescents. However, with the running of the program, it is not clear what factors are correlated with the intention of iron tablet consumption among female adolescents. The purpose of this study was to analyse the factors correlated with the intention of iron tablet consumption among female adolescents.

Methods: This research used a cross-sectional design. The sample consisted of 100 students in senior high school in Surabaya, chosen by proportional random sampling. The independent variables were parent income, knowledge, perceived susceptibility, perceived seriousness, perceived threats, perceived benefits, perceived barriers, and perceived self-efficacy. The dependent variable was female adolescent intention related to consuming iron tablets. The data was collected using a questionnaire and analysed by a chi square test with a level of significance $\alpha<0.05$.

Results: There was a significant correlation between perceived threat (p=0.02), perceived benefit (p=0.01), perceived barrier (p=0.02) and perceived self-efficacy (p=0.00) and female adolescent intention related to consuming iron tablets. There was no correlation between parental income, adolescent knowledge, perceived susceptibility, and perceived seriousness with the intention to consume iron tablets.

Conclusion: From this research, it has been concluded that the factors related to the intention to consume iron tablets in female adolescents were perceived threat, perceived benefit, perceived barrier and perceived self-efficacy. Increasing the confidence of female adolescents in association with the importance of avoiding anaemia by consuming iron tablets is crucial so then they can maintain their health and prevent diseases due to anaemia later on.

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CONTACT

Tiyas Kusumaningrum
✉ tiyas-k@fkp.unair.ac.id
Faculty of Nursing Universitas Airlangga, Surabaya, Indonesia

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INTRODUCTION

Young women are a human resource that will give birth to the future generations of the nation. A phenomenon occurs in Indonesia where there is a high prevalence of iron deficiency anaemia in adolescent girls, at 30% (WHO 2011). Anaemia is a problem that must be overcome in young women, because if it continues until pregnancy, labour and childbirth, then it can increase the risk of bleeding in maternal labour and postpartum women. It can also directly increase the risk of maternal mortality (KEMENKES RI 2017). The high prevalence of iron deficiency anaemia in Indonesian young women has resulted in Indonesia being mandated by the World Health Organisation (WHO) to run an anaemia prevention program. The program provides iron tablets for girls aged 12-18 years old[9] (KEMENKES RI 2014). The provision of iron tablets is at the minimum dose of 60 mg elemental iron and 0.4 mg of folic acid at a dose of once a week, increasing to once a day during menstruation (KEMENKES RI 2014). One of the main targets of the National Medium-Term Development Plan (RPJMN) 2015 -

2019 in Indonesia is an indicator of community nutrition improvement, one of which is the provision of iron supplements (TTD) for young women with a target of 30% by 2019 (Kementrian PPN/BPPN 2014). The access to the program by girls in school (junior high school and senior high school) is a good alternative choice (WHO 2011). An anaemia prevention program in Surabaya senior high school has been implemented since October 2017, however it was not known how far the intention was of the young women willing to consume the tablets. According to the Health Belief Model (HBM) theory, human intention for their personal health behavioural action is a result of a combination of individual beliefs (perceived susceptibility, perceived seriousness, perceived threat, perceived benefit, perceived barrier, and self efficacy), modifying factors (socioeconomic, knowledge, age, gender, ethnicity and personality), and cues for action (Glanz et al. 2015). This study aims to analyse the factors associated with the intention of female adolescents to consume iron tablets as an anaemia prevention effort by using the theory of the Health Belief Model.

MATERIALS AND METHODS

The design used in this research study was a cross-sectional approach. The research was done in a high school located in central Surabaya. This high school is one of the high schools that have implemented an anaemia prevention programs for female students. This research used the proportional random sampling technique. The sample size was based on calculations, resulting in 100 participants. There were 20 classes in the senior high school where the research was conducted, so the proportion of the total samples related to each class resulted in 5 people. The independent variables in this study were the parents' income, knowledge, perceived susceptibility, perceived seriousness, perceived threats, perceived benefits, perceived barriers and perceived self efficacy. The dependent variable was the intention of female adolescents to consume iron tablets. The data was collected using a questionnaire. The questionnaire was adapted from Annisa and Nurmala's (2018) study. There were 54 questions in the questionnaire that consisted of questions about social economy (parents income), 10 questions about their knowledge of anaemia and iron tablets and questions on perceived susceptibility, perceived seriousness, perceived threats, perceived benefits, perceived barriers, perceived self efficacy, information sources and the intention to consume iron tablets. Each participant filled out the questionnaire themselves. The research team was in charge of ensuring that the participants understood the content of the questionnaire and answered it completely. The data was then analysed using a chi square test with a level of significant α=0.05. The statistical software used was SPSS.

RESULTS

Table 1. Participants characteristic

Participants characteristic	Number	Percentage
Age:		
14	2	2%
15	33	33%
16	53	53%
17	12	12%
Total	100	100%
Level of Education		
Class X	53	53%
Class XI	47	47%
Total	100	100%
Parent's job:		
Civil servant	25	25%
Entrepreneur	37	37%
Sales	1	1%
Private employee	27	27%
Army	2	2%
Physicians	5	5%
Home maker	1	1%
University lecturer	1	1%
Priest	1	1%
Total	100	100%
Source of Information:		
School	66	66%
Family	16	16%
Health workers	11	11%
Never got information	7	7%
Total	100	100%

The result of this research showed that almost 58% of the participants had a weak intention to consume iron tablets, and the majority of the participants felt hesitance related to consuming iron tablets. The identification result of the participants' sources of information about iron tablets showed that 66 people (66%) received information from their school, as many as 16% received information from their family, 11 % received information from their health personnel that is from physicians and 7% never got any information about iron tablets.

The participant's characteristics showed that most of the participants were between fifteen and sixteen years old (86%), were in class X, and most of their parents worked as entrepreneurs. Only a small percentage of the parent's jobs was related to health services.

Table 2 showed that the respondents who had parents with a low income per month (65.2%) had a weak intention related to consuming iron tablets. Most of the participants had sufficient knowledge about anaemia and iron tablets, felt vulnerable to anaemia deficiency, and agreed that anaemia deficiency is a serious problem. However, based on the chi square test, there was no correlation between the parents' income, knowledge, perceived susceptibility, and perceived seriousness with the intention of the female adolescents to consume iron tablets. Based on the data for perceived threat, it showed that most of the participants do not feel threatened by anaemia, but it also revealed that the

Table 2. The correlation between factors and the intention on consuming iron tablet.

	Female adolescent intention to consume Iron tablet				Total		p value	Contingency Coefficient
	Weak		Strong					
Parents income (per month)	**n**	**%**	**n**	**%**	**n**	**%**		
Low (< Rp 3.296.212)	15	65.2	8	34.8	23	100	0.42	0.08
High (≥ Rp 3.296.212)	43	55.8	34	44.2	77	100		
Knowledge:								
Lack	2	100	0	0	2	100		
Sufficient	12	66.7	6	33.3	18	100	0.46	0.15
Good	44	55	36	45	80	100		
Individual beliefs:								
Perceived Susceptibility								
Not feeling vulnerable	30	68.2	14	31.8	44	100	0.67	0.18
Feeling vulnerable	28	50	28	50	56	100		
Perceived Seriousness								
Not feeling severe	41	64.1	23	35.9	64	100	0.10	0,16
Feeling severe	17	47.2	19	52.8	36	100		
Perceived Threat								
Not feeling threatened	39	68.4	18	31.6	57	100	0.02	0.24
Feeling threatened	19	44.2	24	55.8	43	100		
Perceived Benefit								
Not feeling useful	47	67.1	23	32.9	70	100	0.01	0.27
Feeling useful	11	36.7	19	63.3	30	100		
Perceived Barrier								
Feeling the barrier	36	69.2	16	30.8	52	100	0.02	0.23
Not feel the barrier	22	45,8	26	54,2	48	100		
Perceived Self Efficacy								
Do not believe in themselves	37	82.2	8	17.8	45	100	0.00	0.41
Believe in themselves	21	38.2	34	61.8	55	100		

number of participants who felt threatened had the strong intention to consume iron tablets. The data of perceived benefit and perceived barrier showed that most of the participants didn't consider iron tablets to be beneficial, and there were barriers to consuming iron tablets. The data on perceived efficacy showed that most of the participants believed that they were able to consume iron tablets beyond their beliefs about the benefits and barriers. The results of the statistical analysis revealed a significant correlation between perceived threat (p=0.02), perceived benefit (p=0.01), perceived barrier (p=0.02) and perceived self-efficacy (p=0.00) with the intention of female adolescents to consume iron tablets.

The contingency coefficient on perceived threat, perceived benefit, and perceived barriers was around 0.23, which showed that individual belief and the intention of consuming iron tablets was not closely related. Perceived self efficacy had a contingency coefficient of 0.41, meaning that it has a positive sufficient correlation with the intention of female adolescents to consume iron tablets.

DISCUSSION

The results of this study indicated that the factors associated with the intention of female adolescents to consume iron tablets based on HBM theory were individual beliefs, especially in relation to the components of perceived threat, perceived benefit, perceived barrier, and perceived self-efficacy. Two other components of individual other beliefs were perceived susceptibility and perceived seriousness, which did not show any correlation with the intention significance. The modification factors of the knowledge and income of the parents, which were also examined in this study, were not shown to correlate to intention.

The intention of female adolescents to consume iron tablets in this study shows that the majority of the participant's intentions were at a weak level. In this study, it was found that the majority of the respondents had a good level of knowledge about anaemia and iron tablets, but generally did not have a strong intention for consumption. This could happen because the knowledge possessed by the adolescents does not provide enough information, so then the teenagers are motivated to consume the iron tablets (Compaore et al. 2014). Research in Vietnam on the factors related to the consumption of supplements, including iron, shows that the intention of women to take supplements, especially iron, is still low outside of pregnancy (Nechitilo et al. 2016). Research carried out in Tigray, Ethiopia, revealed that adolescents do not consume iron tablets due to public awareness, misinterpreting that iron tablets are contraceptive pills, religious and moral influences, and a lack of trust in the value of the iron tablet (Mulugeta et al. 2015). Some studies suggest that anaemia prevention programs in female adolescents were more effective when school-based

(Mulugeta et al. 2015; Rakesh et al. 2015). Considering that, in this study, it was also found that most of the respondents get their knowledge about anaemia at school, thus health workers from both primary health services and school health units need to collaborate in school-based anaemia prevention programs.

The results of this research showed that most of the respondents had not felt threatened by anaemia. However, for the respondents who considered anaemia to be a threatening thing for them, the intention level was strong. The positive correlation between perceived threat and intention in this research was in line with the results of a previous study by Park (2011) , which stated that perceived threat was significantly associated with behavioural intention. This is also consistent with the results by Hubbard (2017) which revealed that someone facing a high perceived threat will have more desire to find information about the situation at hand. However, in the contingency coefficient between perceived threat and intention, there was a low correlation. This happened because according to Glanz et al. (2015), perceived threat is a combination of perceived susceptibility and perceived seriousness where the perceived susceptibility must be strong enough to produce behavioural changes. From the statistical analysis, it was revealed that in this research, perceived susceptibility and perceived seriousness were not significantly related to the intention of iron tablet consumption.

The other significantly positive result in this study was the correlation between perceived benefit and perceived barrier with iron tablet consumption intention. Most of the respondents indicated that they did not feel that consuming iron tablets would give them more benefits. However, when viewed from the percentage of the number of respondents related to the perceived benefits, it appears that the respondents who do not feel that they would benefit had a low intention. Research related to anaemia prevention programs in India conducted by Malhotra (2015) reveals the fact that the rejection by adolescents and their parents was associated with iron tablet supplementation in adolescents. This was because the administration of iron tablets causes side effects that are not well-known by teenagers and their parents. Regarding health behaviour and puberty, the perceived benefits have proven to be one of the strongest predictors that can change adolescent health behaviour for the better (Shirzadi et al. 2016). If there is a high level of perceived benefit followed by a low perceived barrier, then the better the behaviour that is displayed (Shirzadi et al. 2016). Perceived barriers are also said to be a cost of implementing new behaviour (Araban et al. 2017). Perceived barrier can also come from the environment and the people around (Park 2011). From the questions on perceived barriers, it was revealed most of the participants were reluctant to consume iron tablets because of its unattractive packaging and the shape of the iron tablets (64%), and also because most of their friends did not consume them (58%). Some of them did not like the taste of the iron tablets (44%). For teenagers, environmental influences can be very influential, especially when from their peers. Most teenagers will try to adjust themselves to their social group, which can be about socialisation, style of dress, and even the food that they consume. The failure to adjust can make teenagers feel alien to their environment.

This study has proven that there was a significant correlation between perceived self-efficacy with the intention of iron tablet consumption. The correlation tests showed that there was a close relationship at the medium level between perceived self-efficacy and the intention of female adolescents to consume iron tablets ($r = 0.41$). A similar study in Indonesia about perceived self-efficacy and perceived benefits showed that there was a significant correlation between perceived self-efficacy and intention, while perceived benefit showed no correlation (Annisa & Nurmala 2018). Gerdawati (2016) analysed the factors related to female adolescent attitude in relation to the prevention of cervical cancer by HPV vaccination at senior high schools in Lampung, which found similar result explained that there was a significant correlation between self-efficacy against the attitude present in relation to the prevention of cervical cancer. Her argument was that the result may be caused by the existence of peer support and reliable information. Another study about predicting intention to take protective measures during hazing in Singapore revealed that self-efficacy was associated with the intention to take protective measures during hazing (Lin & Bautista 2016). A meta analysis study by Sheeran et al. (2016) suggested that a modification on attitudes, norms, and self-efficacy can change health behaviour effectively. A study of behavioural intention when conducting a health examination recommends that self-efficacy is the strongest factor affecting a person in relation to carrying out a health check, followed by knowledge about health. The study also mentioned that the various factors that exist in HBM that can influence behavioural intention. Self-efficacy is one factor that can directly influence behavioural intention and other perceived factors (Huang et al. 2016). Self-efficacy is an internal mental process in a person that describes a person's ability to control his behavior (Glanz et al. 2015). A person who is able to control his behaviour will increase his intention to carry out a healthy behaviour.

CONCLUSION

From the results, we can conclude that perceived threat, perceived benefits, perceived barriers and perceived self-efficacy is associated with the intention of female adolescents in relation to consuming iron tablets. Perceived self-efficacy is the most correlated factor related to producing intention in female adolescents to consume iron tablets.

In relation to the intention of female adolescents, it is recommended that the government, through its health department, runs a sustainable program distributing iron tablets for female adolescents, which includes comprehensive health education and a counseling component to improve self efficacy. It is also important that the iron tablet program collaborates with schools to achieve a better outcome.

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Original Research

Structural Equation Modeling on Effects of Community Empowerment and Supplementary Feeding on Health Status and Nutritional Status of Pregnant Women

Lantin Sulistyorini

Faculty of Nursing, Universitas Jember, East Java, Indonesia

ABSTRACT

Introduction: rates of health problems related to a chronic lack of energy in pregnant women in Indonesia remain prevalence. This study aimed to develop community empowerment and supplementary feeding on health status and nutritional status among pregnant women.

Methods: the sample included 189 pregnant women living in the six villages in the Jember District. The research used a cluster random sampling technique. The variables included community empowerment, supplementary feeding, health status, and nutritional status of pregnant women. Data analysis was performed using structural equation modeling (SEM) with parameter data estimation using software (Analysis of Moment Structures (AMOS) version 21).

Results: estimations of the direct effects were as follows: community empowerment on health status (0.224), supplementary feeding on health status (0.169), health status on nutritional status of pregnant women (0.001), community empowerment on nutritional status of pregnant women (2.857), supplementary feeding on nutritional status of pregnant women (-0.537), community empowerment on nutritional status of pregnant women through health status (0.000), supplementary feeding on nutritional status of pregnant women through health status (0.000), community empowerment on health status (0.224), supplementary feeding on health status (0.169).

Conclusion: community empowerment remains an important key in improving the engagement of women in maternal health issues. Combined intervention with supplementary feeding based on locality may improve the health outcomes.

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CONTACT

Lantin Sulistyorini
✉ lantin_s.psik@unej.ac.id
Faculty of Nursing, Universitas Jember, East Java, Indonesia

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INTRODUCTION

In Indonesia, data from October 2013 show the upper arm circumference threshold for chronic lack of energy risk is 23.5 cm (Ministry of Health, 2010). This illustrates that mothers with a chronic lack of energy risk will give birth to babies with low birth weights. When a baby is born with low birth weight, it is at risk of death, lack of nutrition, growth disorders, and developmental disorders. Efforts to prevent the risk of chronic lack of energy in pregnant women before pregnancy include increasing the nutritional intake of women of childbearing age to ensure the size of the upper arm circumference in women of childbearing age is at least 23.5 cm (Ministry of Health, 2009). If the circumference of the mother's upper arm before pregnancy is below this number, then it is better to delay the pregnancy in advance so as not to risk giving birth to a baby with low birth weight. However, the Ministry of Health, Republic of Indonesia (2009) showed that pregnant women with a chronic lack of energy and an upper arm circumference less than 23 cm are twice as likely to give birth to low-birth-weight infants compared with mothers who have an upper arm circumference of more than 23 cm. Other health problems among pregnant women are related to low economic levels, low education, unhealthy environment, irregular eating patterns, and poor health conditions (Ministry of Health, 2010). Rates of health problems related to a chronic lack of energy in pregnant women in some villages in the Jelbuk Sub-district of Indonesia's Jember Regency are high (Department of Religious of Jember, 2011). The problem of a chronic lack of energy in the Jelbuk Sub-district of the Jember Regency remains common.

In 2015, there were reported to be 48 pregnant women with a chronic lack of energy in six villages: Jelbuk, Panduman, Sukowiryo, Sucopangepok, Sukojember, and Sugerkidul. Data from the public health center of Jelbuk (October 2015) indicated there were 40 pregnant women with a chronic lack of energy that had been handled. Of the 40 pregnant women with a chronic lack of energy, there were four cases of infants with low birth weight (Department of Religious of Jember, 2011).

One of the principal factors that influence the health status of pregnant women is nutrition. Risk factors that affect the nutritional status of pregnant women include low economic levels, low education, unhealthy environment, irregular eating patterns, and poor health conditions. The nutritional status of pregnant women affects the growth and development of the fetus (Bobak, 2004). Assessing the nutritional status of pregnant women includes monitoring weight gain during pregnancy, measuring the upper arm circumference, and measuring hemoglobin levels. Weight gain during pregnancy is approximately 10–12 kg (trimester 1: less than 1 kg; trimester 2: about 3 kg; trimester 3: about 6 kg). Weight gain each trimester is used to monitor fetal growth (Ministry of Health, 2010).

One solution to the problem of a chronic lack of energy in pregnant women is empowering the community to provide additional food to the local community health service program. Public health service programs are expected by the world health organization to reduce maternal and infant mortality and low-birth-weight cases. These can be implemented by organizing, mobilizing, and empowering the community by involving community leaders, religious leaders, and health cadres directly in families who have pregnant women. They aim to keep pregnant women well and ensure safe and healthy childbirth. This study aimed to develop community empowerment and supplementary feeding model on health status and nutritional status among pregnant women.

MATERIALS AND METHODS

This study was conducted from July 2017 to August 2017 at Jember Regency, Indonesia. This study adopted a cross-sectional approach by recruiting pregnant women living in those regency. Inclusion criteria for research sites included: 1) Jelbuk, Panduman, Sukowiryo, Sucopangepok, Sukojember, and Sugerkidul in Jelbuk, Jember District; 2) pregnant women in these 6 villages who have a very young age of marriage and pregnancy; 3) pregnant women in the 6 villages who are lazy to come to the posyandu; 4) pregnant women in these 6 villages whose nutritional needs are not met due to low economic income so that food nutrition patterns are not met properly; 5) pregnant women in these 6 villages who have low family and community knowledge about the condition or initial symptoms of lack of calorie energy so that they are not given early treatment and become more severe with the occurrence of low birth weight or maternal and infant mortality; 6) Posyandu in these 6 villages that are still less than optimal is related to cadre training on protein lack of energy; 7) the coverage of the target on the lack of protein energy in the 6 villages that still have no screening plans for pregnant women by posyandu and dukun cadres; 8) the use of plantation resources and local agriculture in these 6 villages is less than optimal as an effort to improve family nutrition in overcoming protein lack of energy.

The sampling technique was cluster random sampling, because the population was separated according to certain clusters (i.e., villages). The sample included pregnant women (n=189) in the villages of Sukowiryo, Jelbuk, Sugerkidul, Sukojember, Sucopangepok, and Panduman, Jember Regency. The research instruments used were a Likert-scale questionnaire to find out the level of knowledge (low, medium, and high), attitude (i.e., behavior attitude), and motivation (i.e., level of enthusiasm). Weight scales were used to find out the increase or decrease in weight, and a meter stick was used to find out the height increase. Health status was assessed using a questionnaire. The level of pregnancy knowledge and level of nutrition knowledge were assessed. An upper arm circumference meter was used to find out the increase or decrease in the upper arm circumference, and a gestational age card was used to control pregnancy health. A Tetanus Toxoid (TT) immunization card was used to find out the completeness of TT immunization, and a Ferrous (Fe) tablet was used to find out the supplementary supplement fulfillment. The height of the uterine fundus was measured to determine the growth and development of the uterus, and a sphygmomanometer was used to detect high or low blood pressure.

Data collection techniques included having participants fill out the questionnaire on knowledge level, attitude, motivation, pregnancy knowledge level, and nutritional knowledge level; having participants fill out the TT immunization data form; Ferrous tablets; and measuring body weight, height, circumference of the upper arm, height of the uterine fundus, and blood pressure.

Data analysis was performed using structural equation modeling (SEM) with parameter data estimation using software (Analysis of Moment Structures (AMOS) (Byrne, 2013). SEM functioned to assess the latent variables at the observation level (Bagossi & Yi, 2012). The SEM test simultaneously tested the model (Kline, 2015), which estimated the effect of community empowerment and supplementary feeding on the health status and nutritional status of pregnant women. The study analyzed the estimated direct effects, estimated indirect effects, and estimated total effects between and among variables. The estimated direct effects of

the following variables were examined: 1) community empowerment (X1) on health status (Y1); 2) supplementary feeding (X2) on health status (Y1); 3) health status (Y1) on nutritional status of pregnant women (Y2); 4) community empowerment (X1) on nutritional status of pregnant women (Y2); 5) supplementary feeding (X2) on nutritional status of pregnant women (Y2). The estimated indirect effects of the following variables were examined: 1) community empowerment (X1) on nutritional status of pregnant women (Y2) through health status (Y1); 2) supplementary feeding (X2) on nutritional status of pregnant women (Y2) through health status (Y1). The estimated total effects of the following variables were examined: 1) the sum of all direct effects of community empowerment (X1) on health status (Y1) and indirect effects of community empowerment (X1) on health status (Y1); 2) the sum of all direct effects of supplementary feeding (X2) on health status (Y1) and indirect effects of supplementary feeding (X2) on health status (Y1).

RESULTS

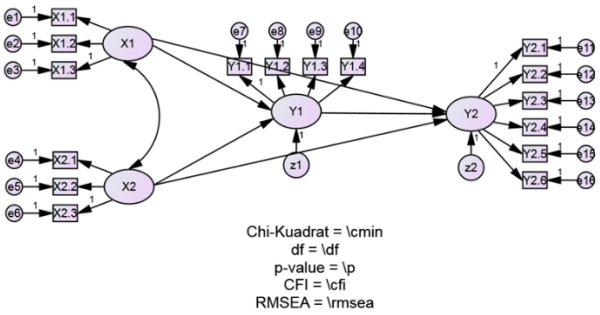

Figure 1. Hypothesis Model on Effect of Community Empowerment and Supplementary Feeding on Health Status and Nutritional Status of Pregnant Women.

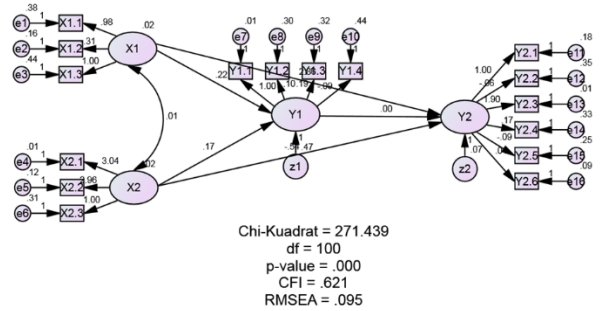

Figure 2. Structural Equation Model: Effect of Community Empowerment and Supplementary Feeding on Health Status and Nutritional Status of Pregnant Women.

Variables of community empowerment (X1) included knowledge level (X1.1), attitude (X1.2), and motivation (X1.3). Supplementary feeding variables (X2) included body weight before pregnancy (X2.1), weight after pregnancy (X2.2), and height (X2.3). The health status variables (Y1) included pre-pregnancy knowledge level (Y1.1), post-pregnancy knowledge level (Y1.2), pre-pregnancy nutritional status (Y1.3), and post-pregnancy nutritional status (Y1.4). Maternal nutritional status variables (Y2) included upper arm circumference (Y2.1), gestational age (Y2.2), TT immunization (Y2.3), Fe tablet (Y2.4), high uterine fundus (Y2.5), and blood pressure (Y2.6). All of the variables and indicators are shown in Figure 1.

In Figure 2 it is found that there is a direct influence of community empowerment (X1) on health status (Y1) of 0.224. There is a direct effect of supplementary feeding (X2) on health status (Y1) of 0.169. There is a direct effect of health status (Y1) on the nutritional status of pregnant women (Y2) of 0.001. There is a direct influence of community empowerment (X1) on the nutritional status of pregnant women (Y2) of 2,857. There is a direct effect of supplementary feeding (X2) on the nutritional status of pregnant women (Y2) of -0.537.

Estimation of Direct Effects

Based on Table 1, the value of 0.224 is the estimation of the direct effect (unstandardized structural loading) of community empowerment (X1) on health status (Y1). This value means that if the level of community empowerment (X1) increases 1 unit, then the health status level (Y1) will increase by 0.224 units.

The value of 0.169 is the estimation of the direct effect (unstandardized structural loading) of supplementary feeding (X2) on health status (Y1). This value means if the level of supplementary feeding (X2) increases 1 unit, then the health status level (Y1) will increase by 0.169 units.

The value of 0.001 is the estimation of the direct effect (unstandardized structural loading) of health status (Y1) on the nutritional status of pregnant women (Y2). This value means that if the health status level (Y1) increases 1 unit, then the nutritional status of pregnant women (Y2) will increase by 0.001 units.

The value of 2.857 is the estimation of the direct effect (unstandardized structural loading) of community empowerment (X1) on the nutritional status of pregnant women (Y2). This value means that if the level of community empowerment (X1) increases 1 unit, then the nutritional status of pregnant women (Y2) will increase by 2.857 units.

The value of -0.537 is the estimation of the direct effect (unstandardized structural loading) of supplementary feeding (X2) on the nutritional status of pregnant women (Y2). This value means that if the supplementary feeding rate (X2) increases 1 unit, then the nutritional status of pregnant women (Y2) will increase by -0.537 units.

Estimation of Indirect Effects

Based on Table 1, the estimation of the individual indirect effect of community empowerment (X1) on the nutritional status of pregnant women (Y2) through health status (Y1) is 0.224 * 0.001 = 0.000. This means the level of nutritional status of pregnant women (Y2) will increase by 0.000 units per 1-unit increase of community empowerment (X1) after mediation by health status (Y1). Therefore, the total coefficient of the indirect effect of community

Table 1. The direct, indirect and total effects of Community Empowerment and Supplementary Feeding on Health Status and Nutritional Status of Pregnant Women

Variables		Direct	Indirect	Total
Y1 < - - - X1	Estimate	0.224		
	p-value	**0.000**		
Y1 < - - - X2	Estimate	0.169		
	p-value	**0.000**		
Y2 < - - - Y1	Estimate	0.001		
	p-value	**0.000**		
Y2 < - - - X1	Estimate	2.857		
	p-value	**0.000**		
Y2 < - - - X2	Estimate	-0.537		
	p-value	**0.000**		
X1 - - -> Y1	Estimate		0.224	
	p-value	**0.000**		
Y1 - - -> Y2	Estimate		0.001	
	p-value		**0.000**	
X2 - - -> Y1	Estimate		0.169	
	p-value		**0.000**	
Y1 - - -> Y2	Estimate		0.001	
	p-value		**0.000**	
Y1 < - - - X1	Estimate			0.224
	p-value			**0.000**
Y1 < - - - X2	Estimate			0.169
	p-value			**0.000**
Y2 < - - - Y1	Estimate			0.001
	p-value			**0.000**
Y2 < - - - X1	Estimate			2.857
	p-value			**0.000**
Y2 < - - - X2	Estimate			-0.537
	p-value			**0.000**

empowerment (X1) on the nutritional status of pregnant women (Y2) is equal to 0.000.

The estimation of the individual indirect effect of supplementary feeding (X2) on the nutritional status of pregnant women (Y2) through health status (Y1) is 0.169 * 0.001 = 0.000. This means the level of nutritional status of pregnant women (Y2) will increase by 0.000 units per 1-unit increase in supplementary feeding (X2) after mediation by health status (Y1). Therefore, the total coefficient of the indirect effect of supplementary feeding (X2) on maternal nutritional status (Y2) is 0.000.

Estimation of Total Effects

The estimation of total effects is as follows: x1 -- > y1, x2 -- > y1. In Table 1, it was found that the estimated direct effect of community empowerment (X1) on health status (Y1) = 0.224. In Table 1, it was found that the estimated total indirect effect of community empowerment (X1) on health status (Y1) = 0.000. Thus, the estimated total effect of community empowerment (X1) on health status (Y1) = 0.224 + 0.000 = 0.224. These results can be interpreted as follows: the health status (Y1) will rise by 0.224 units for each 1-unit increase in community empowerment (X1) after passing all the paths between the two variables. In Table 1, it was found that the estimated direct effect of supplementary feeding (X2) on health status (Y1) = 0.169. In Table 1, it was found that the estimated total indirect effect of supplementary feeding (X2) on health status (Y1) = 0.000. Thus, the estimated total effect of supplementary feeding (X2) on health status (Y1) = 0.169 + 0.000 = 0.169. This result can be interpreted as follows: the health status (Y1) will rise by 0.169 units for each 1-unit supplementary feeding increase (X2) after passing all the paths between the two variables.

DISCUSSION

Direct Effect Estimation

Effect of Community Empowerment on Health Status

The value of 0.224 is the estimation of the direct effect (unstandardized structural loading) of community empowerment (X1) on health status (Y1). This value means that if the level of community empowerment (X1) rises 1 unit, then the health status level (Y1) will rise by 0.224 units.

Variables of community empowerment include level of knowledge, attitude, and motivation. The concept varies according to cultural influences (Olmedo-Alguacil et al., 2015). The level of knowledge of pregnant women about quality of life is associated with different health statuses for individuals with different cultural or ethnic backgrounds (Kagawa-Singer et al., 2010). Pregnancy is a unique time in a mother's life. Striking physiological, metabolic, social, and psychological changes can modify the ability of pregnant women to perform traditional roles and improve their health status associated with maternal life (Montoya et al., 2010). The physiological effects of pregnancy can result in sleep disturbances. Thus, fatigue the physical and mental state associated with maternal knowledge levels about the quality of life during pregnancy and in non-obese pregnant women (Tsai et al., 2016). This suggests that the maternal knowledge level of quality of life is related to health status. Similarly, a Mexican study reported that physical and mental component scores were significantly lower in obese pregnant women than in non-obese pregnant women (Amador-Licona &

Guizar-Mendoza, 2012; Amador et al., 2008). The level of knowledge of pregnant women about their quality of health is associated with women's lives in terms of their self-confidence and breastfeeding motivation (Zubaran & Foresti, 2011). Increasing pregnant women's level of knowledge about quality of life can improve their health status (Ministry of Health, Republic of Indonesia, 2004).

Effect of Supplementary Feeding on Health Status

The value of 0.167 is the estimated standardized non-standard loading effect of supplemental feeding (X2) on health status (Y1). This value means if the level of supplementary feeding (X2) goes up 1 unit, then the health status level (Y1) will rise by 0.169 units.

Supplementary feeding variables include body weight and height. Pregnant women of normal weight with higher education levels have higher levels of nutritional knowledge along with positive breastfeeding preparation attitudes (Lau et al., 2016). The results of a study in Singapore indicated that the prevalence of overweight or obesity pre-pregnancy is 25% and that pre-pregnancy obesity can affect the health status of pregnant women, leading to conditions such as preeclampsia. This figure is lower than the proportion of overweight or obese pregnant women aged 18 to 69 years (Ministry of Health, 2010), which was 45% worldwide in 2014 (World Health Organization, 2016). The differences are due to different age and race composition factors. The results of research in Singapore show that overweight and obesity rates increased by about 1% per year, especially in Malay and Indian races (Ministry of Health, 2010). It is related to the comfort factor of eating outdoors. As many as 60% of Singaporeans regularly eat in public places, such as hawker centers, food courts, and coffee shops, and Singaporeans consume excessive calories and fat (Health Promotion Board, 2010). The results suggest that Malay and Indian diets contain more saturated fats and highly nutritious foods (Neelakantan et al., 2016). Other research finds that women alter their physical activity and dietary patterns during pregnancy (Chen et al., 2013; Padmapriya et al., 2015). Pregnant women in Singapore refuse physical activity and increase sitting time, television viewing time (Padmapriya et al., 2015), and consumption of milk, fruit, vegetables, rice, noodles, and bread (Chen et al., 2013). Pregnant women of the Malay and Indian races more often increase sitting time during pregnancy compared to the Chinese race in Singapore. Lifestyle changes, especially pregnant women's knowledge of nutrition, can increase the number of overweight or obese pregnant women in Singapore (Padmapriya et al., 2015).

Effect of Health Status on Nutritional Status of Pregnant Women

The value of 0.001 is an estimate of the (unstandardized structural loading) effect of health status (Y1) on the nutritional status of pregnant women (Y2). This value means that if the health status level (Y1) rises 1 unit, then the nutritional status of pregnant women (Y2) will increase by 0.001 units.

Variables of health status include the level of knowledge of pregnancy and the level of nutritional knowledge. A study of the effects of maternal knowledge levels of pregnancy on body weight during pregnancy found that the prevalence of overweight or obesity around the world is 39% and 13%, respectively, in women of reproductive age (World Health Organization, 2016). The results showed that knowledge of breastfeeding preparation is influenced by maternal obesity (Turcksin et al., 2014). This is because mothers' overweight or obesity significantly affects the initiation and duration of breastfeeding but only slightly affects their attitude in preparation for breastfeeding (Amir & Donath, 2007; Turcksin et al., 2014). The results of the study showed that pregnant women are less likely to be obese during breastfeeding preparation than non-obese women (Guelinckx et al., 2012). Other results found that obese pregnant women were no different from non-obese pregnant women in motivation for breastfeeding preparation (Hauff et al., 2014).

Effect of Community Empowerment on Nutritional Status of Pregnant Women

The value of 2.857 is the estimation of the non-standardized impact of loading (structural loading) from community empowerment (X1) on the nutritional status of pregnant women (Y2). This value means that if the level of community empowerment (X1) rises 1 unit, then the nutritional status of pregnant women (Y2) will increase by 2.857 units.

Variables of community empowerment include pregnant women's level of knowledge, attitude, and motivation. The attitude of pregnant women is very important in optimizing fetal health and well-being, as it is beneficial in the short- and long-term to mother, child, family, and society (Victora et al., 2016; Lau et al., 2016). This is one of the factors associated with the behavior of breastfeeding (Linares et al., 2015). The attitude of pregnant women is a predictive factor of exclusive breastfeeding initiation (Cox et al., 2015; Linares et al., 2015; Wang et al., 2014). It is also present in the antenatal period and is influenced by multidimensional factors (Roll & Cheater, 2016). Factors affecting maternal attitude to breastfeeding include maternal characteristics, including age (Nouer et al., 2015), ethnicity (Linares et al., 2015), education level, occupational status (Ishak et al. 2014), household income (Persad & Mensinger, 2008), parity (Buckles & Kolka, 2014), pregnancy intentions (Kost & Lindberg, 2015), caregivers (Fok

et al., 2016), and previous exclusive breastfeeding experience (Mitra et al., 2004). Community empowerment, such as a good level of knowledge, can influence maternal attitudes on improving health status.

Effect of Supplementary Feeding on Pregnant Women's Nutritional Status

The value of -0.537 is the estimated standardized non-standard loading effect of supplementary feeding (X2) on the nutritional status of pregnant women (Y2). This value means that if the supplementary feeding rate (X2) rises 1 unit, then the nutritional status of pregnant women (Y2) will rise by -0.537 units.

Supplementary feeding variables include the weight and height of pregnant women. According to the nutritional adequacy rate of 2004, a pregnant mother is encouraged to consume the following additional amounts of energy and protein: (1) first trimester: 100 calories and 17 grams of protein; (2) second trimester: 300 calories and 17 grams of protein; (3) third trimester: 300 calories and 17 grams of protein. In this way, expectations can be met in three consecutive trimesters. The need for vitamins and minerals in all three trimesters also increases. Pregnant women need additional vitamin A (300 RE), thiamin (0.3 mg), riboflavin (0.3 mg), niacin (0.3 mg), folic acid (200 mcg), pyridoxine (0.4 mg), vitamin B (0.2 mcg), vitamin C (10 mg), calcium (150 mg), magnesium (30 mg), iodine (50 mcg), selenium (5 mcg), manganese (0.2 mg), and fluoride (0.2 mg). The additional iron requirement in pregnant women varies. In the first trimester, they do not require additional iron. However, in trimester 2, they require as much as 9 mg, and in trimester 3, they require as much as 13 mg. The additional need for zinc is as follows: trimester 1: 1.7 mg; trimester 2: 4.2 mg; trimester 3: 9 mg.

Indirect Effect Estimation

Effect of Community Empowerment on Nutritional Status of Pregnant Women through Health Status

The estimation of the individual indirect influence of community empowerment (X1) on the nutritional status of pregnant women (Y2) through health status (Y1) is 0.224 * 0.001 = 0.000. This means that the level of nutritional status of pregnant women (Y2) will increase by 0.000 units per 1-unit increase of community empowerment (X1) after mediation by health status (Y1). Therefore, the total coefficient of the indirect effect of community empowerment (X1) on the nutritional status of pregnant women (Y2) is equal to 0.000.

During pregnancy, pregnant women should prepare to welcome the birth of a baby by increasing their knowledge about pregnancy and complete nutrition. A healthy mother will give birth to a healthy baby. Maternal nutrition during pregnancy is one of the determining factors that affect the baby's birth. During pregnancy, there is an increased need for nutrients, such as carbohydrates, proteins, vitamins, and minerals (Hasugian, 2012). Therefore, pregnant women with adequate knowledge can increase their nutritional intake as needed during pregnancy to improve health status.

Effect of Supplementary Feeding on Nutritional Status of Pregnant Women through Health Status

The estimation of the individual indirect effect of supplementary feeding (X2) on the nutritional status of pregnant women (Y2) through health status (Y1) is 0.169 * 0.001 = 0.000. This means the level of nutritional status of pregnant women (Y2) will increase by 0.000 units per 1-unit supplementary feeding increase (X2) after mediation by health status (Y1). Therefore, the total coefficient of the indirect effect of supplementary feeding (X2) on maternal nutritional status (Y2) is 0.000.

Fulfillment of nutritional needs is very important, especially related to changes in the mother's body and fetal development. During pregnancy in the mother, there are various physical and physiological changes. In a normal pregnancy, there is a change in maternal weight gain in accordance with fetal growth and development due to the addition of fat reserves, placental formation and development, increased body fluids, and breast enlargement.

Due to hormonal changes, pregnant women will experience psychological, social, and emotional changes. A fetus that grows optimally will be born alive with a weight of 2500–3500 grams. To achieve that goal, the mother's weight should rise during pregnancy by about 7–12 kg.

Nutritional requirements during pregnancy are higher compared to pre-pregnant conditions. As gestation progresses, mothers need a higher number of nutrients and additional foods. The aim of optimizing nutritional intake according to gestational age is to achieve a healthy pregnancy.

The quantity, quality, and timeliness of supplementary feeding in pregnant women are adjusted to the rate of fetal growth in each trimester. In the first trimester, there is an increase in the number of cells and the formation of organs. This process needs to be supported by the intake of nutrients, especially protein, folic acid, vitamin B12, zinc, and iodine. Although fetal growth is not rapid in the first trimester, all necessary nutrients must be sufficient in preparation for faster growth in the next trimester. In the second and third trimesters, the fetus grows rapidly to 90% of all growth processes during pregnancy. Nutrients needed are protein, iron, calcium, magnesium, vitamin B complex, and omega 3 and omega 6 fatty acids. Additional energy needs during pregnancy are different in each trimester. In the first trimester, the major nutrient additions are proteins, vitamins, and minerals necessary for the growth of the brain and nerve cells, which mostly takes place during the first trimester. In the second and third trimesters, average energy

requirements increase by 350 to 500 calories per day. The energy and nutrient needs of pregnant women are very diverse, because it relates to the size of the body and lifestyle of each pregnant woman. Simply, nutritional adequacy during pregnancy can be monitored by weight gain appropriate to gestational age (Ministry of Health, 2009).

There is a relationship between community empowerment/providing additional food and health status. This is seen in pregnant women who consume nutritious foods derived from carbohydrates, proteins, vitamins, and minerals needed during pregnancy.

Total Effect Estimation

Effect of Community Empowerment on Health Status

In Table 1, it was found that the estimated direct influence of community empowerment (X1) on health status (Y1) = 0.224. It was also found that the total estimated indirect effect of community empowerment (X1) on health status (Y1) = 0.000. Thus, the estimated effect of total community empowerment (X1) on health status (Y1) = 0.224 + 0.000 = 0.224. These results can be interpreted as follows: the health status (Y1) will rise by 0.224 units for each 1-unit increase in community empowerment (X1) after passing all the paths between the two variables.

Variables of community empowerment include level of knowledge, attitude, and motivation. Negative perceptions of pregnant women on health status during pregnancy can lead to a decrease in the quality of life associated with health status (Kolu et al., 2014).

Respecting cultural differences in understanding quality of life as it relates to health status is important, because the dimensions and sources of social and religious support may differ between cultures (Kagawa-Singer et al., 2010). Research results in the United States show that Asians have a quality of life associated with better health status than Whites and other ethnic groups (Chowdhury et al. 2008; Zahran et al., 2005). Because Asians are very respectful of culture, a clean and healthy lifestyle has become one of their core beliefs.

Intellectual factors influence pregnant women making decisions on breastfeeding preparation (Chin et al., 2008), and pregnant women with high levels of education have more accurate breastfeeding knowledge than those with low levels of education (Zhou et al., 2010). This study is consistent with studies showing a positive relationship between knowledge of infant feeding and maternal decision-making on infant feeding (Radzyminski & Callister, 2016; Roll & Cheater, 2016). With a high level of knowledge and understanding, pregnant women can make informed decisions about the preparation for childbirth and breastfeeding.

Effect of Supplementary Feeding on Health Status

Table 1 shows that the estimated direct effect of supplementary feeding (X2) on health status (Y1) = 0.169. In Table 4, it was found that the total estimated indirect effect of supplementary feeding (X2) on health status (Y1) = 0.000. Thus, the estimated total effect of supplementary feeding (X2) on health status (Y1) = 0.169 + 0.000 = 0.169. This result can be interpreted as follows: the health status (Y1) will rise by 0.169 units for each 1-unit supplementary feeding increase (X2) after passing all the paths between the two variables.

Supplementary feeding variables include weight and height. The normal weight indicator shows the quality of life associated with a person's health status (Amador-Licona & Guizar-Mendoza, 2012), especially the level of knowledge of pregnancy and nutrition. Pregnant women of normal weight with a high level of education have high levels of pregnancy knowledge and positive breastfeeding attitudes (Ishak et al., 2014; Nouer et al., 2015).

The results show that pregnant women who are in good health and leading happy lives have important health. Pregnant women today are more likely to consider breastfeeding an important part because of the many benefits of breastfeeding on health, and they are willing to participate in healthy breastfeeding behavior (Bakas et al., 2012). Pregnant women with a high quality of life associated with a better health status have positive attitudes toward breastfeeding. In contrast, the following characteristics of health status are associated with poor quality of life: poverty, fatigue, energy loss, depression, anxiety, labor difficulties (Ware et al., 1995). This illustrates that inadequate quality of life in pregnant women is associated with poor health status and low use of antenatal care services (Nisar et al., 2016). The results of previous studies suggest that pregnant women with few antenatal visits have a quality of life associated with low health status (de Oliveira et al., 2015). During an antenatal visit, attendance of healthcare support is crucial in the selection of baby food (Meedya et al., 2010). The results of research in Hong Kong show that pregnant women with low levels of antenatal knowledge have poor breastfeeding attitudes (Lau, 2010) because pregnant women decide to breastfeed during early pregnancy (Brand et al., 2011). This has an impact on pregnant women with a quality of life associated with poor health status and negative breastfeeding attitudes. A good level of understanding of supplementary feeding can create a positive attitude for pregnant women on health status.

CONCLUSION

Community empowerment and supplementary feeding aspect remain a critical part in improving general health and nutritional status of pregnant women. Health workers need to develop specific intervention in engaging community around maternal health areas. Supplementary feeding

intervention also need to be done within villages by cooperating with local governments.

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Original Research

Religiosity and Self-Efficacy in the Prevention of HIV-Risk Behaviours among Muslim University Students

Angga Wilandika

Institute of Health Science 'Aisyiyah Bandung, Indonesia

ABSTRACT

Introduction: The high prevalence of HIV infection among an age group of 18–25 years, both globally or nationally, was indicating students vulnerable to HIV/AIDS infections. Prevention of HIV risk behaviours can be used as a religiosity approach to strengthening the self-efficacy on prevention HIV-risk behaviour. However, there were limited studies on the association between religiosity and self-efficacy on prevention of HIV-risk behaviour among student, especially Muslim students. The aims of this study were to identify the correlation between religiosity with self-efficacy in the prevention of HIV-risk behaviours.

Methods: The study employed a correlation study. The sample size comprised 404 Muslim university students with proportionate stratified random sampling. Student's religiosity was measured by The Muslim Piety questionnaire and self-efficacy was measured by Self-Efficacy in the Prevention of HIV-Risk Behaviour questionnaire. Descriptive analysis using mean, standard deviation, percentage and frequency distribution. Meanwhile, inferential analysis using Pearson's Correlation.

Results: The results were found that most of the students have high levels of religiosity and strong self-efficacy in the prevention of high-risk behaviour. Further analysis revealed a significant ($p < 0.005$) and strong correlations ($r = 0.6780$) between religiosity and self-efficacy in the prevention of HIV-risk behaviour. Higher levels of religiosity were followed by higher levels of self-efficacy on the prevention of HIV-risk behaviours among students.

Conclusion: findings can be used by academic and health professionals, to implement a religiosity based program to strengthen a self-efficacy of HIV-risk behaviour. Further research can be a focus on the nursing interventions based on religious beliefs to strengthen self-efficacy in the prevention of HIV/AIDS infections.

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CONTACT

Angga Wilandika
✉ wiland.angga@gmail.com
Institute of Health Science 'Aisyiyah Bandung, Indonesia

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INTRODUCTION

Globally, the prevalence of HIV infection in young people was increased (CDC, 2010). The increasing incidence of new HIV cases among young people between ages 15-24 years in one year was 30% (5,000 people) (UNAIDS, 2014).

Meanwhile, in Indonesia, according to Komisi Penanggulangan AIDS Nasional (2015), the number of HIV and AIDS cases was increased from year to year. The number of new infections in 2015 from January to March 2015 was 7212 cases. The prevalence of HIV infection between ages 20-24 years was 15.9% (Kementerian Kesehatan RI, 2015) or the emerging new cases as many as 1,150 cases (0.9%) from the last year (Kementerian Kesehatan RI, 2014).

Although those report does not indicate to the prevalence of HIV/AIDS incident especially among college students, Hightow et al. (2005) revealed that the trend of increasing HIV infection in the age 18-24 years happens to college students. The high numbers of HIV cases among college students have a correlation with their activities that are susceptible to HIV infection. A study about HIV-risk behaviour documented high rates in the college students (Chan,

Passetti, Garner, Lloyd, & Dennis, 2011; de Carvalho et al., 2006; Khan et al., 2013).

College students are vulnerable to engage in sexual intercourse outside marriage, drinking alcohol, exchange in a sexual partner, and anal or oral sex (Johnston, O'Malley, Bachman, & Schulenberg, 2012). In addition, college students' exposure to pornography like watching a porn video and read adult magazines increase the incidence of HIV risk behaviours (Njue, Voeten, & Remes, 2011).

Survei Kesehatan Reproduksi Remaja Indonesia (SKRRI) 2007 and *Survei Demografi dan Kesehatan Indonesia* (SDKI) 2012 reported that a young people aged 18-24 are vulnerable to risky behaviours such as sexual intercourse before marriage, smoking, drinking alcohol, and drug abuse (BKKBN, 2012). Similar to Rahmati et al. (2009) that reported a young people in countries with a Muslim majority population has a susceptibility to high-risk behaviours such as drug abuse, drinking alcohol, and high-risk sexual activity.

Based on the findings, it is seen that college students tend to be heavily involved in a risk-behaviours that lead to HIV infection. Therefore, prevention of HIV risk behaviour should be aimed to reduce the cases of HIV infection among college students.

Prevention of HIV risk behaviours can be achieved by college students if there are strong self-beliefs, or in other words, self-efficacy beliefs. Those who have a strong sense of self-efficacy have confidence in their ability to commit to their goals (Bandura, 2010). Meanwhile, those who have low efficacy would be easy to believe that a task is too difficult to implement (van Dinther, Dochy, & Segers, 2011).

Nonetheless, Indonesia which has majority Muslim, the incidence of HIV infection would not be depressed just because of their strong Islamic teachings for Muslims (Sern & Zanuddin, 2014). In fact, there are people who sometimes ignore the teachings of his religion so easily engage in HIV risk behaviours (Hasnain, 2005). In addition, prevention-based religiosity is also sometimes hard done by a Muslim because of adherence to the teachings of his religion and his ability to carry out such practices (Balogun, 2010).

Whereas in Islam, self-beliefs and ability to do something right, is mentioned in the Al-Qur'an Surah Ar-Ra'ad verse 11, means that: "...Indeed, Allah will not change the condition of a people until they change what is in themselves...". Based on the verses of the Al-Qur'an that it is a Muslim should have strong religious beliefs in doing an act.

In addition, there are various other verses of the Al-Qur'an that could become the foundation that a Muslim must have a strong sense of religiosity in performing an action on the basis of piety to Allah as articulated in the QS. Adz-Dzariat verse 56 which means: "... and I did not create the jinn and mankind except to worship Me" and QS. Al-An'am verse 162 which means: "Truly, my prayer and my service of sacrifice, my life and my death, are (all) for Allah, the Cherisher of the Worlds". Hence, a Muslim must be able to make religiousness and obedience to religious teachings as a protection and prevention from various HIV-risk behaviours (Hasnain, 2005).

Observe the various findings above, seen that religiosity had an impact on HIV-risk behaviours, although not specific against self-efficacy in preventing the HIV-risk behaviour. So far, there has been no research that sees the links between religiosity with self-efficacy in the prevention of HIV-risk behaviour among student, especially in the context of Islam. It thus becomes important to further identify the relationship between the level of religiosity among students with self-efficacy in preventing HIV-risk behaviours.

MATERIALS AND METHODS

This study used a cross-sectional design. This study has passed the ethical clearance of Medical Research Ethics Commission Faculty of Medicine, Universitas Padjadjaran (Ethical Approval Letter Number 454/UN6.C1.3.2/KEPK/PN/2016). The respondents of this study are students at one of the universities in Jatinangor.

The sampling technique approach was used in a proportionate stratified random sampling that is by dividing the population into groups of homogeneous or strata. The sample size of each faculty was taken proportionally according to the number of population in each faculty using the proportional allocation formula. Sample in this study considered several inclusion criteria including: (1) undergraduate and diploma students either in the second year or until the last year, (2) recorded as an active students, (3) Muslims, (4) not students of cooperation or extension classes, and (5) students living with parents or living in boarding houses. The number of samples used in this study as many as 404 Muslim students. Response rate in this study amounted to 95.7%.

The Muslim student's religiosity was measured using the instrument of The Muslim Piety (Hassan, 2007) that has been translated into Bahasa Indonesia. The questionnaire has validity values ranging from 0.354 - 0.770 and the reliability value of the Guttman Split-Half coefficient of 0.947. Meanwhile, self-efficacy was measured using Self-Efficacy in the Prevention of HIV Risk Behaviour Questionnaire, where the questionnaire had validity values ranging from 0.474 - 0.972 and the value of the Cronbach's Alpha coefficient ratio of 0.957. The descriptive analysis uses the calculation of mean, standard deviation, percentage and frequency distribution. Meanwhile, the inferential analysis uses Pearson's Correlation.

RESULTS

Descriptive analysis was done to see the description of characteristics of university students involved in this research.

Table 1. University Student's Characteristics (n = 404)

Student's Characteristics	f	%
The average age is 20.3 years		
Age range 18 - 25 years		
Study Time		
≤ 2 years	167	41,3
> 2 years	237	58,7
Gender		
Man	169	41,8
Women	235	58,2
Current Domicile		
Boarding house	318	78,7
Parent's house	86	21,3
Spouse		
Have spouse	169	41,8
Did not have spouse	235	58,2
Marital Status		
Single	397	98,3
Married	7	1,7
HIV Information Exposure		
Yes	382	94,6
No	22	5,4

Table 2. The Mean of Muslim Religiosity Score and Self-Efficacy in Prevention of HIV-Risk Behaviour (n = 404)

	mean ± DS	f	%
Muslim's Relogiosity	**13,54 ± 2,70**		
Height	15,06 ± 1,56	272	67,33
Medium	10,51 ± 1,53	130	32,18
Low	4,50 ± 0,71	2	0,50
Self-Efficacy	**80,25 ± 8,65**		
Height	86,73 ± 5,11	217	53,71
Medium	72,74 ± 5,14	187	46,29

Table 3. The Correlation Test Results between Muslim Religiosity with Self-Efficacy in Prevention of HIV-Risk Behaviour among Students

	Self-Efficacy in the Prevention of HIV-Risk Behaviours	
	(p)	*(r)*
Muslim's Religiosity	0,000	0,687

Students in this study are all Muslim who are studying undergraduate and diploma degree. The age range of students ranged from 18 to 25 years with an average age of 20.3 years. Most of the female students (58.2%), said they do not have spouses (58.2%) and have been studying for more than two years (58.7%). In addition, most of the students stayed in boarding houses (78.7%) and almost all unmarried (98.3%) and said they had received information about HIV (94.6%) (Table 1).

In this study, most of the students (67.33%) were classified as having high religiosity with the average score of 15.06 ± 1.56. Similarly, self-efficacy in the prevention of HIV-risk behaviour was found that the majority of college students (53.70%) belonged to high self-efficacy with an average score 5.11 (Table 2).

The results of Pearson's Product Moment correlation analysis showed statistically significant (p = 0,000) and strong (r = 0.678) with a positive relationship between Muslim religiosity and self-efficacy of prevention of HIV risk behaviour (Table 3). In other words, the alternative hypothesis (Ha) is accepted, where higher the religiosity level it will increase the self-efficacy level in the prevention of HIV risk behaviour among the student.

DISCUSSION

Religiosity is one of the important individual factors that determine students' self-efficacy in the prevention of HIV-risk behaviour. The dimensions of religiosity that include religious beliefs, religious practices, experiential, consequence and devotion, was linked to student's self-efficacy in avoiding HIV risk behaviours. Religious beliefs and religious practices become the decisive aspect of enhancing self-efficacy in preventing risky behaviour among students. Gillum and Holt (2010) suggest that religiosity is the strongest predictor of self-confidence in the ability to prevent HIV-infected behaviours.

High self-efficacy in the prevention of HIV-risk behaviours will influence students' choices in determining not to engage in the HIV-risk behaviour. The self-efficacy in the prevention of risk-behaviours was observed in this study includes behaviour prevention self-efficacy: extramarital sex, watching pornographic videos, using drugs, using needle tattoo, unwillingness to talk about sexual intercourse, and neglecting the HIV status of a spouse or close friend.

Self-efficacy that was perceived by students in the prevention of HIV risk behaviour encourages students to think, to consider, and to act more appropriately in achieving the goal in avoiding risky behaviours that may arise around them and not engaging in HIV risk behaviours. Schwarzer (2008) argues that self-efficacy is a strong predictor of health behaviour changes. A person with high self-efficacy will be able to achieve the goal of a behaviour, achieve optimal levels of health or avoid a variety of behaviours that can harm yourself.

Students with high self-efficacy will be able to control the situation and conditions in their life including HIV risk behaviour prevention measures. Individuals with high self-efficacy may withstand environmental influences not to engage in risky behaviours such as unsafe sexual activity, sexual intercourse with multiple partners, use of drugs, alcohol use and other health risk activities (Caprara, Regalia, & Bandura, 2002; Wosinski, 2008). Bogale, Boer, and Seydel (2010) assert that individuals with strong self-efficacy have confidence in the ability to successfully avoid involvement in HIV risk behaviours.

As described above, in this study, self-efficacy in the prevention of HIV risk behaviour is closely related to the factor of religiosity possessed by students. Students with high levels of religiosity will have self-efficacy in preventing high-risk behaviours of HIV both in cognitive and affective. They will consider more of their actions to avoid engaging in self-harming behaviours.

The religiosity of students was seen and assessed from various forms of worship activities in the life. Religious activity is not only happening when students perform religious ritual practices but also when performing other activities that are driven by power and belief in the Creator and his invisible religious teachings. In this study, the degree of religiosity can be seen or measured based on several domains of religiosity. The religiosity of Muslim students is closely related to the belief in the Rukun Iman dan Rukun Islam.

Safrilsyah, Baharudin, and Duraseh (2010) say that religiosity is closely related to the religious values embedded in human beings which then provide a major role in the development of human character. In the view of Islam, religiosity refers to all dimensions of life, values, dedication and religious practice (Azam, Qiang, Abdullah, & Abbas, 2011), as mentioned in Al-Qur'an letter of Al-Baqarah verse 208 which means: "O you who believe! enter into Islam whole-heartedly (*kaffah*)...". Based on the letter of Al-Baqarah verse 208, religiosity is not limited to what is seen in the expression of one's religious behaviour, but must be practised against all aspects of life with all the capabilities possessed. Safrilsyah et al. (2010) say that a religious person must be able to know, understand and interpret all life that has been created by God in order to worship God alone.

The diversity of the level of religiosity in the students can be caused by the experience of religiosity on the students is a personal matter or in other words, only the students themselves who know it. Changes that occur within the student will reflect the level of religiosity in each individual. Students begin to discover personal experiences and beliefs of the divine. On the other hand, changes in values and adjustments that occur during this period can also raise the chances for conflicts and doubts about their religious beliefs.

The significant correlation between religiosity and self-efficacy in preventing HIV risk behaviours suggests that the stability of student-owned religiosity will influence self-belief in its ability to avoid HIV risk behaviours. Religiosity is a dominant aspect related to self-efficacy and preventive measures of HIV/AIDS risk behaviour. Koenig, King, and Carson (2012) who say someone with strong religiosity will have high self-efficacy. On the other hand, high self-efficacy will create a comfortable feeling for his ability to complete a task or an activity so that the stress conditions felt in his life will be reduced. Luquis, Brelsford, and Rojas-Guyler (2012) also say religiosity affects the individual's attitude in dealing with risky behaviour.

Religiosity facilitates the understanding of the individual that affects the goals, actions, and outcomes one anticipates, including self-efficacy (Martin, 2008). According to Davidsdottir and Jonsdottir (2013), a religious person has greater welfare experience, optimism, strong self-efficacy and fewer problems. Further Koenig et al. (2012) says that when a religious person faces a complex problem, they believe that by surrendering to God, they are confident they can overcome the problem and change the situation and they believe in gaining the strength to deal with the adversity. Such beliefs will reduce feelings of helplessness and a feeling of lack of ability to solve problems.

The belief that God has control over all human endeavours in maintaining health will have a positive impact on thinking, self-belief in his ability to successfully conduct health behaviour. Even the belief that God gives self-control over risky behaviours will have an impact on self-assurance or self-efficacy of success in preventing risky behaviours from being able to avoid risky behaviours and avoid adverse consequences (Goggin, Murray, Malcarne, Brown, & Wallston, 2007; Seybold & Hill, 2001).

In Islam, religiosity and self-efficacy are also depicted in Al-Qur'an letter al-Baqarah verse 286 which means: “Allah does not charge a soul except (with that within) its capacity. It will have (the consequence of) what (good) it has gained, and it will bear (the consequence of) what (evil) it has earned. "Our Lord, do not impose blame upon us if we have forgotten or erred. Our Lord, and lay not upon us a burden like that which You laid upon those before us. Our Lord, and burden us not with that which we have no ability to bear. And pardon us, and forgive us, and have mercy upon us. You are our protector, so give us victory over the disbelieving people."

Based on the letter of Al-Baqarah verse 286, Allah asserts that everyone will be able to face any task or event that occurs because God promises that will not burden a person but with something in accordance with his ability. Therefore, through belief in God, one will be able to deal with various problems. In the context of prevention of HIV risk behaviours, students with high religiosity will be able to cope with various HIV risk behaviours, as long as they have high self-efficacy, believe in and believe they are capable of such precautions.

Kagimu et al. (2013) say the individual who believes in God can avoid risky behaviours such as pre-marital sexual intercourse and lower the potential for HIV infection. Similarly, Goggin et al. (2007) and James and Wells (2003), argue that religious beliefs affect a person's awareness, cognition and emotions when doing something. Someone through the cognitive process will collect various information, weigh the pros and cons and

strengthen self-efficacy on whether to perform a risky behaviour or not.

As for how religiosity plays a role in improving self-efficacy prevention of HIV risk behaviour associated with fear of God when will do something that is not good. Kagimu et al. (2013) reported that religiosity works by instilling fear in God to avoid His punishment. Where a religious person believes that God sees and observes his every action, as it is written in the Qur'an Al-Hujurat verse 108 which means: "O you who have believed, do not put (yourselves) before Allah and His Messenger but fear Allah . Indeed, Allah is Hearing and Knowing".

The way religiosity works against self-efficacy and HIV infection prevention behaviours is illustrated as follows: creating a fear of God and His punishment for those who disobey Him as well as embarrassment when they do the forbidden things; encouraging obedience to God; creating the feeling that God is seeing everyone; and encourage self-control and increase the self-efficacy of self-efficacy resulting in inner fighting to avoid risky behaviour (Kagimu et al., 2013).

High levels of student religiosity will strengthen self-efficacy in the prevention of sexual behaviour outside of marriage, watching pornographic videos, using drugs, using tattoo needles, unwillingness to talk about sexual intercourse, and neglecting partner's HIV status among college students. With strong self-efficacy in college students, so they can take precautions at risk of HIV.

CONCLUSION

The results of this study conclude a strong and significant positive relationship between Muslim religiosity and self-efficacy prevention of HIV-risk behaviour among students. Therefore, the alternative hypothesis (Ha) is accepted. Thus, the higher the Muslim religiosity will be followed by the higher self-efficacy of prevention of HIV risk behaviour among students. The results of this study can be used by academics, universities and health practitioners such as nurses in the development of religious spiritual based coaching programs aimed at increasing the self-confidence of each college student's individual ability to avoid behaviours that can lead to HIV infection in the campus environment.

The limitation of this study lies in the place of study which is only done in one place. This study only involves students from one university so that the results of the research cannot describe widely. In addition, there is no standard instrument that specifically measures the self-efficacy of HIV-risk behaviour prevention. Therefore, researchers develop instruments to measure the self-efficacy. However, to ensure the reliability of these instruments, then have tested the instrument that includes the validity and reliability test. Instrument test results show that the instrument is reliable and appropriate measures of self-efficacy prevention of HIV risk behaviours among university students.

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Original Research

Development of the Mind-Body-Spiritual Nursing Care Model (MBS) for Coronary Heart Disease Patients

Ninuk Dian Kurniawati[1], Nursalam Nursalam[1] and Suharto Suharto[2]

[1] Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia
[2] Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Introduction: Patients with coronary heart disease (CHD) may experience various physical, psychological or spiritual issues. A holistic mind-body spiritual nursing care (MBS) model is needed to help patients' cope with the issues. This study aimed to develop an MBS nursing care model for CHD patients.

Method: The study employed a crossectional design with 110 CHD patients participated in the study. Respondents were asked to fill out questionnaires to gather the required data. Criteria for respondent selection were Moslem, aged 40-75 year, medical diagnosis of CHD, and haemodynamically stable. The independent variables were focal, contextual and residual stimuli, while the dependent variables were coping and spirituality. Data were analyzed using partial least square.

Results: The results show that the mind-body-spiritual nursing care formed focal stimuli. Spirituality is formed by focal, contextual, residual stimuli and coping style. Nursing care significantly affects spirituality, shown by T-statistics of 6.795. Spirituality can be explained by patience, endeavour toward wellness, and offer the results only to the God by 72%, while the rest is explained by other factors.

Conclusion: MBS nursing care model has a strong relationship with spirituality. This model needs to be applied in a further research to see its effectiveness in improving spirituality and expression of cardiovascular risk inflammatory markers.

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coronary heart disease; mind-body-spiritual; nursing care model; spirituality

CONTACT

Ninuk Dian Kurniawati
ninuk.dk@fkp.unair.ac.id
Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

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INTRODUCTION

A provision of a mind-body-spiritual nursing care that emphasizes not only on physical aspect of care, but also psychological, and spiritual care are needed. However, a fit of a model of nursing care for patients treated in hospital has yet to be developed, hence, it is necessary to develop the mind-body-spiritual nursing care model.

Being treated in the hospital with the acute coronary syndrome can be very distressfull for patients, on several aspects. A qualitative study revealed that patients' experiencing multiple issues during hospital stays and need help from nurses to help them cope with the issues (Kurniawati, Nursalam, & Suharto, 2017). Stress has been empirically shown to interfere with immunity, mainly through a so-called hypothalamus-pituitary-adrenal (HPA) axis. After the brain perceives the stressor, the hypothalamus releases corticotropin-releasing hormone (CRH), which then stimulates the pituitary gland to release ACTH. This will, in turn, causes the adrenal cortex to express glucocorticoids.

Several studies have investigated the mind-body, spiritual intervention, but current research has not incorporated mind-body-spiritual intervention comprehensively in a series of nursing orders. Psychological interventions proved to be effective in improving pain tolerance and postoperative immunologic resistance (Rehatta, 2005), reducing postoperative pain, anxiety, tension and analgesic use in 20 studies involving a total of 1297 patients (Nelson et al., 2013) and decreasing physical symptoms and mental in patients with chronic physical and mental pain, (Vranceanu et al., 2014).

In addition to the mind-body intervention, studies have demonstrated the benefits of spiritual-based intervention in increasing HSP 72 (Asiyah, Putra, & Kuntoro, 2011), increasing alpha waves in the brain and decreasing cortisol levels, decreasing stress and anxiety (Barnby, Bailey, Chambers, & Fitzgerald, 2015), decreasing depression in patients with acute coronary syndrome (Warber et al., 2011), and lowering the cortisol levels of HIV patients (Murray et al., 2007).

Therefore, the literature review supports the promising benefits of a comprehensive mind-body-spiritual nursing care intervention for CHD patients. This study aimed at developing a mind-body-spiritual nursing care for coronary heart disease patients treated at hospitals. This is supported by the previously described literature review that highlights the promising benefits of the mind-body-spiritual nursing care for the patients that until to date, is yet to be developed.

MATERIALS AND METHODS

The research used an analytical explanatory design where required data were taken cross-sectionally approximately over six months period. The population of the study was all patients with coronary heart disease hospitalised in some hospitals in Surabaya, Indonesia. The sample was drawn from the population treated at various rooms in a top-referral-government-owned hospital in Eastern Indonesia, a university hospital and a big private hospital in Surabaya. The inclusion criteria were CHD patients with a stable hemodynamic status had been treated for at least two days and had a capacity to understand written information; whereas the exclusion criteria were CHD patients with decreased level of consciousness and withdrew from the study for many reasons. Participants of the study were selected randomly by simple random sampling.

The sample size was calculated using statistical power and effect size adjusted to SEM-PLS model sample size table from Sholihin & Ratmono (2013). Based on the preliminary model which consist of four big arrows, significant at 5% and minimum R2 of 0.50, the minimum sample size yielded from the table was 42. Thus, the number of respondents in this study was 110 respondents.

Data were collected from February to April 2017 using questionnaires developed from a previous study (Kurniawati et al., 2017) in 2017. Questionnaires were tested for validity and reliability and they were all valid and reliable with r = 0,508-951, p = 0,008- 0,000, and Cronbach alfa between 0,638- 927. All subjects were required to fill out the questionnaires once cross-sectionally and there was no follow up conducted by the authors. The collected data were tabulated and analysed using statistical analysis of Smart Partial Least Square with aimed to develop a statistical model of MBS nursing care.

The study protocols were reviewed and approved by Commissions of Ethics from Rumah Sakit Universitas Airlangga Number 023 / KEH / 2016, dated August 6, 2016, and RSUD Dr. Soetomo Number 262 / Panke.KKE / IV / 2017, dated April 6, 2017.

RESULTS

Table 1 shows participants' demographic data. It can be seen from the table 1 that the majority of respondents are male (68.18%), Javanese (82.73%), from Surabaya (54.5%), with medical diagnosis of STEMI (42.73%), underwent second hospitalisation (51%), aged 56-70 years (54.55%) and on their third day of hospital stay (43.64%).

Variables examined in this study were focal stimuli (X1), contextual stimuli (X2), residual stimuli (X3), coping (Y1) and spirituality (Y2). The focal stimuli depicted by Patient's issues (X1.1) and the Mind-Body-Spiritual Nursing Care (X1.2). The contextual stimuli had 3 indicators: Hospital Environment (X2.1), Family Support (X2.2), and Past Hospitalisation Experience (X2.3). Residual stimuli were measured through four aspects of indicators: education (X3.1), occupation (X3.2), health insurance (X3.3) and patients' religious rituals (X3.4). Coping was measured through two indicators: problem-focused coping (Y1.1) and emotional-focused coping (Y1.2). Lastly, Spirituality was defined by patients

Table 1. Characteristics of Respondents

Variables	Sub Variables	Frequency	%
Sex	Men	75	68.18
	Women	35	31.82
Ethnicity	Banjar	2	1.82
	Batak	3	2.73
	Javanese	91	82.73
	Madurese	7	6.36
	Buginese	1	0.91
	Malay	2	1.82
	Sasak	1	0.91
	Sundanese	3	2.73
Address	East Java	97	88.18
	Borneo	2	1.8
	Madura	8	7.3
	West Nusa Tenggara	2	1.8
	Papua	1	0.9
Age	40-50	28	22.45
	51-60	47	42.73
	61-70	35	31.82
Medical Diagnosis	Angina, UAP	23	20.91
	NSTEMI	13	11.82
	STEMI	47	42.73
	OMI	22	20.00
	Iskemia	5	4.55
Number of hospitalisation	1	32	29.09
	2	51	46.36
	3	27	24.55
Length of hospital stay	1	5	4.55
	2	28	25.45
	3	48	43.64
	4	29	26.36

Table 2. Distribution of Respondents of Children and Caregivers Meeting the Research Criteria at YPAC Surakarta March-April 2017 (n= 23)

Variable	Indicator	Sub Indicator	Category									
			Never		Sometimes		Often		Always		Total	
			n	%	n	%	n	%	n	%	n	%
Focal stimuli	Patients's issue	Physical	4	3.64	24	21.82	55	50.00	27	24.55	110	100
		Psychological	46	41.82	36	32.73	27	24.55	1	0.91	110	100
		Social	71	64.55	31	28.18	8	7.27	0	0.00	110	100
		Spiritual	23	20.91	67	60.91	18	16.36	2	1.82	110	100
	MBS nursing care	Assess	4	3.64	15	6.82	46	20.91	155	70.45	220	100
		Help meet the patient's physical need	2	1.82	14	6.36	44	20.00	160	72.73	220	100
		Fascilitate the coping strategy	37	33.64	10	4.55	48	21.82	125	56.82	220	100
		Fascilitate spiritual activity	47	42.73	11	5.00	68	30.91	94	42.73	220	100
Contextual stimuli	Hospital environment	Comfortness	2	0.61	36	10.91	119	36.06	173	52.42	330	100
		Nurse's communication	0	0.00	15	6.82	62	28.18	143	65.00	220	100
		Nurse's friendliness	0	0.00	33	15.00	63	28.64	124	56.36	220	100
	Family support	Emotional suppport	2	0.91	17	7.73	78	35.45	123	55.91	220	100
		DuCognitive suppport	6	2.73	34	15.45	54	24.55	126	57.27	220	100
		Material suppport	2	0.91	27	12.27	73	33.18	118	53.64	220	100
	Past experience	Satisfaction toward nursing care	89	40.45	48	21.82	71	32.27	12	5.45	220	100
		Effectiveness of previous coping style	124	56.36	40	18.18	48	21.82	8	3.64	220	100
Coping	Problem focused coping	Planned-problem solving	12	5.45	52	23.64	65	29.55	91	41.36	220	100
		Direct action	4	1.82	34	15.45	98	44.55	84	38.18	220	100
		Seeking help	3	1.36	31	14.09	96	43.64	90	40.91	220	100
		Information seeking	3	1.36	27	12.27	77	35	113	51.36	220	100
	Emotional Focused Coping	Avoidance	61	27.73	129	58.64	19	8.64	11	5	220	100
		Deny	61	27.73	123	55.91	21	9.55	15	6.82	220	100
		Self-criticsm	131	59.55	45	20.45	31	14.09	13	5.91	220	100
		Look for silver lining	26	11.82	81	36.82	78	35.45	35	15.91	220	100
Spirituality	Patience		0	0	30	9.09	103	31.21	197	59.70	330	100
	Endevour		11	3.33	11	3.33	98	29.7	210	63.64	330	100
	Submission to God		0	0	17	5.15	98	29.70	215	65.15	330	100

Table 3. Description of Residual Stimuli

Indicator	Sub Indicator	n	%
Education	Non/elementary	26	23.64
	High school	50	45.45
	Diploma	7	6.36
	≥ S1	27	24.55
Occupation	None/housewife	16	14.55
	Labor, retirement, farmer, driver	27	24.55
	Entrepreneur, Private employee	57	51.82
	Goverment employee	10	9.09
Health insurance	Govt health insurance class III	5	4.55
	Govt health insurance class II	45	40.91
	Govt health insurance class I	55	50.00
	Private insurance	5	4.55
Religious rituals	Never	0	0
	Sometimes	5	4.55
	Often	40	36.36
	Always	65	59.09

during illness, endeavour toward wellness, and a total submission toward the God's will.

Table 2 summarises the data of focal and contextual stimuli. Based on the table it can be concluded that the majority of respondents used a problem-focused coping style, rather than emotional-focused coping style with seeking information reported being the highest proportion (51.36%). The most common coping style was under emotional focused coping style that respondents never used was self-criticism (59.55%). Most respondents reported always being patient (59.7%), endeavouring toward wellness (63.64%), and offering all the result of the treatment to God (65.15%).

After the outer model was defined, the inner model was then analysed. The purpose of structural model analysis (Inner Model) was to examine the influence of exogenous factors on endogenous factors. The value used as a reference was the T-

Table 2. Convergent validity of the latent variables

No	Latent variable	Indicator	Convergent Validity		
			Loading factor (λ)	T-Statistic	Validity
1	Focal Stimuli	MBS nursing care	1.000		Valid
2	Contextual stimuli	Hospital environment	0.803	1.330	Valid
		Family support	0.903	1.782	Valid
		Hospitalisation experience	-0.620	0.954	Valid
3	Residual stimuli	Education	0.857	4.302	Valid
		Religious ritual	0.604	2.408	Valid
		Health insurance	0.725	3.102	Valid
4	Coping	Problem focused coping	0.999	2.813	Valid
		Emotional Focused Coping	-0.586	1.254	Valid
5	Spirituality	Patience	0.917	34.652	Valid
		Endeavour toward wellness	0.914	33.456	Valid
		Submission to God	0.928	24.137	Valid

Table 3. Relationship between the exogenous factor and endogenous factor

No	Pathway	Path Coefficient	T-Statistic	T-Table	Significance
1	(X1) Focal stimuli → (Y1) Coping	0.189	1.260	1.96	Not significant
2	(X2) Contextual stimuli → (Y1) Coping	0.129	0.778	1.96	Not significant
3	(X3) Residual stimuli → (Y1) Coping	0.217	1.294	1.96	Not significant
4	(X1) Focal stimuli → (Y2) Spirituality	0.720	6.795	1.96	Significant
5	(X2) Contextual stimuli→ (Y2) Spirituality	-0.013	0.158	1.96	Not significant
6	(X3) Residual stimuli → (Y2) Spirituality	0.187	1.857	1.96	Not significant
7	(Y1) Coping → (Y2) Spirituality	0.073	0.613	1.96	Not significant

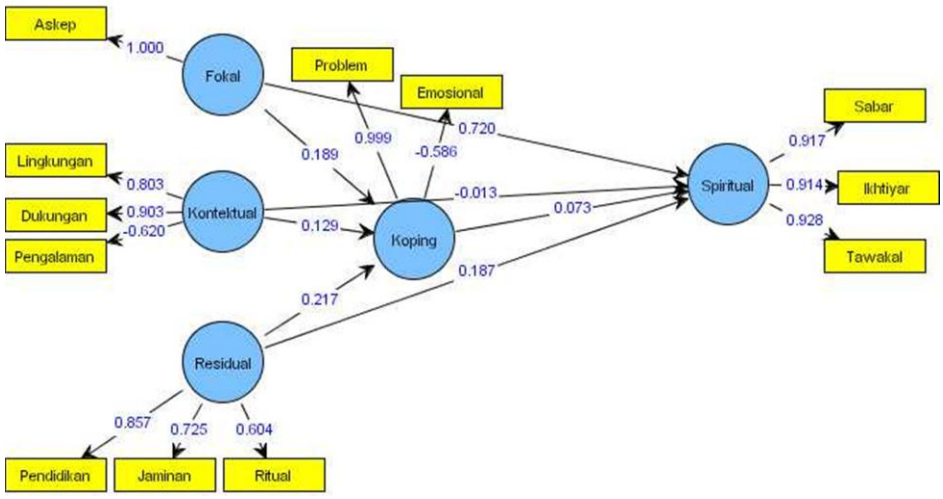

Figure 1. Mind-body-spiritual nursing care model, pathway analysis

table value (109.025 = 1.96). Exogenous factors were considered had an effect on endogenous factors if the T-statistic value was greater than a table with fault tolerance (α) = 5%. The result of the significance test is described in the following table.

To develop a fit model, the structural equation model was analysed by measuring both the outer and inner model. The measurement model (outer model) was analyzed by testing the validity and reliability of the construct. As can be seen from table 4, patients' issues and occupation were statistically not significant in defining the model, thus those two indicators were removed from the model. It can be concluded from the Table 5 that almost all exogenous variables had no significant effect on endogenous variables. Only one exogenous variable had a significant effect on an endogenous variable, namely the focal stimuli variable of spirituality.

Figure 1 illustrates the model of nursing care of MBS on the spirituality of patients treated with CHD. It can be seen from the figure that none of the exogenous factors has an influence on endogenous factors, except for the mind-body-spiritual nursing care itself (R-square value shows 0.720). Therefore in providing patient of CHD treated in hospital, the main focus of the nurses rely solely on the nursing care itself. The R-square value shows that the variable of spirituality can be explained by patience,

endeavour, and submission to God by 72%, while the rest explained by other factors.

To determine whether the MBS nursing care model has a good ability in predicting the improvement of someone's spirituality, the goodness of fit (GoF) test was performed and yielded a score of 0,6172. Showing that the MBS nursing care model's ability to explain its research variables very strongly. In another word, the size of the influence of variable is big.

DISCUSSION

The results show that the focal, contextual, and residual stimuli do not have any effect on coping. Additionally, the contextual stimuli, residual stimuli, and coping also have no effect on spirituality. Only focal stimuli have a significant effect on spirituality. These findings suggest that the patients' spirituality can be enhanced directly by the provision of focal stimuli, which is the mind-body-spiritual nursing care. This is a very promising result because it highlights the strength of the study that proves the MBS nursing care may improve the patients' spirituality although other aspects of care may less favourable.

These findings are inconsistent with the previous theory that the desired adaptive response, spirituality, was not only influenced by focal stimuli, but also the contextual and residual stimuli. The results of Siyoto, Peristiowati, & Agustin (2016) showed focal stimulus, contextual stimulus, and residual stimulus related to the coping mechanism in people living with HIV. Several studies have also shown that spirituality is related to coping of cancer patients in Iran (Abuatiq, 2015; Rezaei, Adib-Hajbaghery, Seyedfatemi, & Hoseini, 2008), and African-American respondents subjected to racist treatment (Cooper, Thayer, & Waldstein, 2014).

The limitation of the study was the efficacy of the model has not been investigated; therefore, further study is required to prove the efficacy of the model in coronary heart disease patients treated in hospitals.

CONCLUSION

Based on the results of the study can be concluded that the focal stimuli, the mind-body-spiritual nursing care, affects spirituality directly without going through coping pathways. This is very beneficial because several variables that might affect spirituality can be ignored as long as the focal stimuli can be given by the nurse properly.

However, as previously described in the discussion, this mind-body spiritual nursing care model firstly needs to be tested to patients with coronary heart disease to know its effectiveness in improving spirituality and other aspects before it can be used in clinical practice.

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Original Research

The Effectiveness of Roy's Adaptation Model for Patients with Chronic Kidney Disease Undergoing Pre-Dialysis in Indonesia

Tri Hapsari Retno Agustiyowati[1], Ratna Sitorus[2], Agung Waluyo[2] and Besral Besral[3]

[1] Politeknik Kesehatan Bandung, West Java, Indonesia
[2] Department of Medical Surgical Nursing, Faculty of Nursing, Universitas Indonesia, Indonesia
[3] Faculty of Public Health, Universitas Indonesia, Indonesia

ABSTRACT

Introduction: Patients with chronic kidney disease (CKD) undergoing pre-dialysis requires a good self-management to control low protein intake and maintain kidney function. Adaptation to the existing stimulus through coping and adjustment mechanisms is important to maintaining good kidney function. However, few studies applied nursing theory based to guide intervention in helping the adaptation of patient CKD with their condition. The purpose of this study is to evaluate the effectiveness of Roy's adaptation model towards physiological and psychological adaptation response among patients with CKD undergoing pre-dialysis.

Methods: This study was conducted using a quasi-experiment to patients with CKD pre-dialysis, age over 18 years old. We modified Roy's adaptation model for patients with CKD undergoing pre-dialysis.

Results: A total of 70 subjects agreed to join the study, 38 subjects in intervention and 32 subjects in the control group. The mean of eGFR ranged from 26.3 to 26.6 mL/min/1.73 m2. We found that Roy's adaptation model has significantly improved drinking behavior, reduce protein intake, blood creatinine, and psychosocial adaptation response after the intervention.

Conclusion: These study findings suggested that Roy's adaptation model is effective to help patients with CKD undergoing pre-dialysis improve their behavior and maintain kidneyfunction . Model dissemination, advocacy to related units, and application in nursing care in patients with chronic kidney disease pre-dialysis are necessary.

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chronic kidney disease; pre-dialysis; physiological adaptation response; psychological adaptation behavior; Roy's adaptation model

CONTACT

Tri Hapsari Retno Agustiyowati
trihapsariretno60@gmail.com
Politeknik Kesehatan Bandung, West Java, Indonesia

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INTRODUCTION

Chronic Kidney Disease (CKD) is defined as kidney damage over three months with glomerulus filtration rate (GFR) less than 60 ml/minute/1.73 m2 that consists of five stages (Black and Hawk, 2005; Wein, Kanvoussi, Novick, Partin, Peters, 2007; Thomas, 2008). Patients with CKD recommend to perform hemodialysis if they are in stage 5 and pre-dialysis for those in stage 3 or 4 (KDOQI Guidelines, 2000; Wein, Kanvoussi, Novick, Partin and Peters, 2007; Daugirdas, Blake and Ing, 2007; Ignatavicius, 2010). According to the data from Indonesian Nephrology Association in 2011, it's estimated about 25 million Indonesian people had an impairment of kidney function. The Indonesian Hospital Association (PERSI) reported that 500 per one million people diagnosed with chronic kidney disease and 60% of them were adults and older age. Furthermore, according to the Indonesian National Health Insurance data, around 70,000 patients with kidney disease required a dialysis, only 12,804 of them already perform a hemodialysis, and above 30,000 patients is recommended to do pre-dialysis.

Roy's Adaptation model is one of the nursing theories focused on human adaptation based onstimulus from the internal and external environment. It is involved a processed that regulate by subsystem and cognitive as an adaptive system, in the form of physiology function, self-concept, role function, and interdependence (Roy, 1991; Tomey and Alligood, 2006, Meleis, 2007). Roy considers the

patient has adaptability in overcoming the problem, as a living system, open, and able to adjust. The adjustment made due to changes in elements, substances or materials contained in the environment. As a system, human beings are a unity, will get input from the inside and outside environment, namely focal, contextual and residual stimuli (Roy, 1991; Tomey and Alligood, 2006; Meleis, 2007). The role of nurses based on Roy's theory is required to assess the adaptability of patients and help them adapt with changes due to the disease and its consequences (Roy, 1991; Tomey and Alligood, 2006).

Previous studies have reported that Roy's adaptation model can be used as a research framework to improve human behavior adaptation. A review of ten studies evaluated Roy's adaptation model as a research framework in various research designs suggested that this model was effective to explore the human adaptation (Sosha and Al Kaladeh, 2012). Rogers and Keller (2010) applied Roy's adaptation model to develop physical activities program and showed improvement in the adaptation of physical strength and endurance. Furthermore, Roy's adaptation model used as a framework for developing intervention programs in patients performed intravenous catheter insertion found a positive adaptation response (Wendler, 2002). Among patients with CKD undergoing hemodialysis, Roy's adaptation model used to develop health education program and showed a significant result in the improvement of physiological and role functions (Afrasiabifar, Karimi, and Hassani, 2013).

Patients with CKD undergoing pre-dialysis requires good self-management to control low protein intake and maintain their kidney function (Kresnawan & Maskun, 2012; Hase, 2012; Branson, 2007). They are required to have the ability to adapt change, to the situation or negative stimulus to maintain the function of the kidney. A study conducted by Fougue (2007) found that well-controlled protein intake can reduce the mortality rate and delayed initiation of dialysis up to 40%. Maintaining good kidney function can be done by adapting to the existing stimulus through coping and adjustment mechanisms. However, few studies applied nursing theory to guide intervention to help patients with CKD undergoing pre-dialysis to adjust their condition. The purpose of this study was to evaluate the effectiveness of the developed Roy's adaptation model for improving physiological and psychological adaptation response.

MATERIALS AND METHODS

This study was conducted using quasi-exsperimental, pre - post test design with the control group. Three referral hospitals in Indonesia were used to develop intervention and measure outcome from June to December 2016. The outcome measures were assessed at baseline (pre-test), after intervention (post-test), and one month follow up. The inclusion criteria were patients diagnosed with CKD undergoing pre-dialysis phase II and IV, conscious, without severe complication, and able to speak without cognitive and mentally disordered. A consecutive sampling was applied to select participants. A total of 70 patients with CKD pre-dialysis were recruited, 38 in the intervention group and 32 in the control group.

The intervention was modified according to Roy's adaptation theory for patients with CKD undergoing pre-dialysis developed by the author (Agustiyowati et al, 2017). This intervention focus on providing comprehensive health education program which consists of seven steps (Figure 1). The first step is to identify potential stimulus, including physical, psychological, and social, then created a goal setting together with the patients. The second step is a health education program to improve coping mechanism by understanding the disease, how to maintain health condition, and importance of a routine check-up and adherence to medication. The third step is focused on improving physiological adaptation behavior by providing health education related to food, diet, drinking pattern, urinate pattern, itchy management, and activities daily living. The fourth step is managed behavior adaptation of self-concept. The Fifth step is to improve the behavior adaptation of role function. The sixth step is to improve interdependence adaptation behavior. The last step is to create and improve a family support for the patients.

Health education was performed for the patients and family in three sections, eight days for each

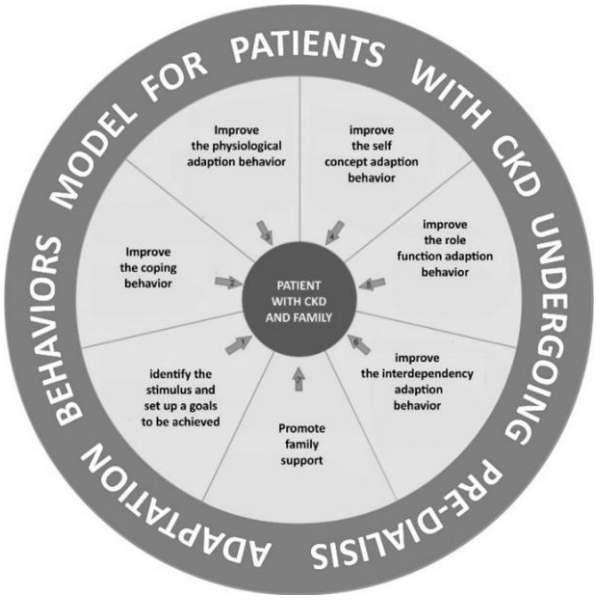

Figure 1. The developed Roy's adaptation behavior model for patients with CKD undergoing pre-dialysis

Table 1. Demographic and clinical characteristics of patients with chronic kidney disease undergoing pre-dialysis (n=70)

Variable	Intervention		Control		p value
	n	%	n	%	
Gender					
Male	26	68.4	17	53.1	0.193
Female	12	31.6	15	46.9	
Education					
Not finished	1	2.6	2	6.3	0.851
Elementary school	10	26.3	6	18.8	
Junior high school	6	15.8	7	21.9	
Senior high school	12	31.6	6	18.8	
Diploma III/Bachelor	9	23.7	11	34.4	
Employment					
Government officer	2	5.3	1	3.1	0.278
Business	3	7.9	3	9.4	
Private officer	6	15.8	1	3.1	
Retired	13	34.2	14	43.8	
Unemployed	6	15.8	7	21.9	
Housework	8	21.1	6	18.8	
Health coverage					
National health insurance	34	89.5	29	90.6	0.856
Company coverage	-	-	1	6.3	
Private insurance	2	5.3	2	3.1	
Non-insurance	2	5.3	-	-	
	Mean	SD	Mean	SD	
Age (years)	60.1	14.8	65.2	11.1	0.111
eGFR (ml/minute/1.73 m2)	26.3	12.7	25.6	13.1	0.710
Protein intake (gram)	39.7	13.6	31.1	11.4	0.176
Creatinine (Umol/L)	2.9	1.3	2.8	1.1	0.704

Table 2. The effectiveness of Roy's adaptation behaviour for patients with chronic kidney disease undergoing pre-dialysis on physiological adaptation response (n=70)

	Intervention (n=38)		control (n=32)		P value
	Mean	SD	Mean	SD	
Protein intake					
Pre-test	39.7	13.6	31.1	11.4	0.006
Post-test 1	34.8	11.3	35.1	9.8	0.932
Post-test 2	38.6	4.1	39.5	12.4	0.705
Creatinine					
Pre-test	2.9	1.3	2.8	1.1	0.693
Post-test 1	2.6	1.3	2.4	1.5	0.423
Post-test 2	2.5	1.2	3.2	1.3	0.036
Ineffective of fluid intake (%)					
Pre-test	37	97.4	32	100	0.543
Post-test 1	36	94.7	32	100	0.056
Post-test 2	1	2.6	30	93.7	0.001

Table 3. The effectiveness of Roy's adaptation behaviour for patients with chronic kidney disease undergoing pre-dialysis on psychological adaptation response (n=70)

	Intervention (n=38)		Control (n=32)		p value
	Mean	SD	Mean	SD	
Self-concept					
Pre-test	41.7	6.2	44.6	6.2	0.058
Post-test 1	47.7	4.6	45.5	6.9	0.162
Post-test 2	53.3	3.1	45.5	6.9	<0.001
Role Function					
Pre-test	20.6	3.6	22.2	3.3	0.059
Post-test 1	22.6	3.8	21.5	3.5	0.212
Post-test 2	25.8	2.9	21.5	3.5	<0.001
Interdependency					
Pre-test	16.9	3.7	17.5	3.1	0.489
Post-test 1	17.4	3.1	16.6	3.5	0.317
Post-test 2	20.0	2.3	16.6	3.5	<0.001

section, and 80 minutes to 120 minutes per days. We provide a book of the adaptive behavior for patients with CKD undergoing pre-dialysis that consists of a workbook for nurses, learning materials for nurses and booklets for patients and families.

The demographic information was collected on enrolment: this information included age, gender, level of education, employment, and health coverage. The primary outcome of this study was the physiological and psychological adaptation response. The secondary outcome was knowledge and attitude chronic kidney disease pre-dialysis

Physiological adaptation response. The outcome measures of physiological adaptation response are protein intake, drinking pattern, and blood creatinine. Laboratory data were exctracted from medical records including, blood creatinine, blood urea, and eGFR. We also recorded 24 hours urine. In addition, patients required to fill out the sheet of food recalls to record 24 hour fluid, calories, and protein intake. To illustrate the amount of food intake using the household size that later converted to gram unit.

Psychosocial adaptation response questionnaire. The questionnaire was used to measure the behavior of psychosocial adaptation of patients with chronic kidney disease pre dialysis including a behavioral adaptation of self-concept, role function, and interdependence. This instrument was modified from the instrument of nursing assessment and intervention for adult hemodialysis patient: application of Roy's adaptation model developed by Keen, et al. (1998). A total of 27 items covered a 14 question about the self-concept, seven questions for role function, and six items questions for interdependency adaptation. The questionnaire is a Likert scale from 1 to 4, one means never, and four is always. The total score for self-concept, role function, and interdependency adaptation ranged from 13 to 56, 7 to 28, and 6 to 24, respectively. The higher score reflected high or good adaptation behavior. Item correlation ranged from 0.371 to 0. 680, and the Cronbach alpha in the present study ranged from 0.673 0.729.

This research has been approved by the Ethics Committee of the Faculty of Nursing, Universitas Indonesia (0342/UN2.F12.D/HKP.02.04/2015). Respondents who were willing and meeting inclusion criteria were given a pre-test as baseline data, post-test, and one month follows up. Researcher and research assistant conducted an intervention and divided into three sections. The first section was an 80 minutes discussion to identify stimulus or stressor, established the goals to be achieved, and improves the coping mechanism. The second section was 120 minutes health education program focused on improving the adaptation behavior of physiology, self-concept, role function and interdependence and improve family support. The last section was evaluation and reviewed the educational materials.

The comparation of characteristics and clinical variables in patients with CKD between intervention and control groups were determined using the chi squared and independent t test. The Paired t-test was used to test the mean different out the outcome interest before and after the intervention. A general linear model with repeated measure was used to evaluate the effectiveness of the intervention after controlling the confounding factors. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 20.00 for Windows.

RESULTS

Demographic and clinical characteristic of patients with CKD undergoing pre-dialysis

The majority of the subjects were male (68.4%) in the intervention group and 53.1% in the control group (Table 1). The mean age of the two groups were 60.1 (SD=2.35) and 65.2 (SD=3.57), respectively. Above 15% of the subjects were graduated from senior high school and almost half of the subjects were retired with over 90% covered by the national health insurance. The mean of eGFR for the intervention groups was 26.3 (SD=12.7), 39.7 (SD=13.6) for protein intake, and 2.9 (SD=1.3) for creatinine. There were no significant differences between intervention and control group in term of a demographic characteristic, eGFR, protein intake, and creatinine.

Effectiveness the behavior adaptation model to the outcome interest among patients CKD undergoing pre-dialysis

The creatinine was reduced significantly from 2.9 (SD=1.3) before intervention to 2.5 (SD=1.2) after one month follow up (p value=0.036) (Table 2). The proportion of patients who has ineffectiveness of fluid intake was decreased significantly among intervention group before and after intervention group (97.4% at baseline to 2.6% after one month follow up) compared to control group (100% at baseline to 93.7% after one month follow up). Although protein intake did not show statistically significant, it's decreased from 39.7 to 38.6 at one month follow up compared to a control group that showed an increase in protein intake at follow up time.

Table 3 showed the effectiveness of Roy's adaptation behavior model of psychological adaptive response, including self-concept, role function, and interdependence among patients CKD undergoing pre-dialysis. In the intervention group, the mean score of self-concept was increased significantly from 41.8 (SD=6.2) in pre-test to 53.4 (SD=3.1) at follow up ($p<0.001$).The mean score of role function and interdependency was improved in the intervention group after intervention from 20.6 (SD=3.6) to 25.8 (SD=2.9) and 16.9 (SD=3.7) to 20.0, respectively.

DISCUSSION

We found that Roy's adaptation model was effective to improve fluid intake and creatinine among patients with chronic kidney disease (CKD) undergoing pre-dialysis. Patient adherence to fluid intake is crucial for maintain kidney function (Pang & Chang, 2001). If they are non-adherence to fluid intake restriction, can lead to a greater risk of complications such as cardiovascular diseases and hypertension (Barnett, Yoong, Pinikahana, Si-Yen, 2007). Our health education program was designed to not only provide the information regarding how much the appropriate fluid for the patient with CKD undergoing pre-dialysis. A Pprevious study suggested that education should also be accompanied by encouragement and support so that patients are willing to adhere on the restriction of fluid intake (Barnett, Yoong, Pinikahana, Si-Yen (2007). Therefore, health education guided by Roy's adaptation model is important to develop in a routine clinic setting to improve patient's outcome.

Roy's adaptation model for patients with chronic kidney undergoing pre-dialysis was significantly effective to improve psychological adaptation behavior, including self-concept, role function, and interdependency. Self-concept refers to an understanding of how the individual views or judges his own personality as it really is. The process of forming self-concept is considered as a major asset and the main determinant of individual behavior. Mental health problems, such as depression, loss of hope, demoralization, fear, anxiety, and stress were very common in patients with CKD (Clarke., Kissane., Trauer., Smith. 2005; Cukor., Cohen , Peterson, Kimmel, 2007). Therefore, effective stress management and utilizing social support is essential to assist patients having good self-management (Novak., Constantini., Schneider., Beanlands, 2013).

The role function is to recognize as the patterns of one's social interactions in relation to others, reflected in the primary, secondary and tertiary roles. The focus is on how one can act in society according to his position. Chronic kidney disease is a condition that requires a treatment which are time-consuming, high demanding, and even difficult for some patients and their families. These conditions have psychosocial consequences such as isolation from social life, career and occupational disruptions, lifestyle restrictions, decreased independence, declined expectations to meet long-term life goals (White, McDonnell, 2014). Several studies from other countries highlight that patients with CKD unable to continue their work due to their physical condition (Van Manen, et al., 2001, Ekelund, et al. 2007 in White, McDonnell, 2014). This limitation can lead to economic difficulties, thus the role of self-management is very important to overcome the psychosocial constraints of the patients (Novak, M., Constantini., Schneider., Beanlands, 2013).

The proportion of patients with CKD undergoing pre-dialysis showed improvement in the interdependency from 70.41 in pre-test to 83.30% after one month follow up. This research proves that Roy's adaptation behavior model developed for patients with CKD undergoing pre-dialysis is effective on interdependence adaptation behavior. Interdependence is the balance between dependence and independence in receiving something for theirself. Interdependence adaptation behavior focuses on relationships with others (individuals and groups) and the ability to give love, appreciation, values, guidance, knowledge, skills, commitments, possessions, time and talents (Roy & Heather 1991, Roy & Andrew, 1991 in Tomey & Alligood, 2006; Roy, 2009).

CONCLUSION

Roy's adaptation model developed for patients with CKD undergoing pre-dialysis was an effective model to improve physiological, especially fluid intake and creatinine level, and psychological adaptation response including self-concept, role function, and interdependency. This model can be applied in a clinical setting to guide nurse providing health education for patients with CKD undergoing pre-dialysis. Future study to test using rigorous methods and long-term follow up is warranted.

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Original Research

Perceived Benefits and Intakes of Protein, Vitamin C and Iron in Preventing Anemia among Pregnant Women

Mira Triharini[1], Nursalam Nursalam[1], Agus Sulistyono[2], Merryana Adriani[3] and Pei-Lun Hsieh[4]

[1] Nursing Faculty, Universitas Airlangga, Surabaya, Indonesia
[2] Dr. Soetomo General Hospital Surabaya, Indonesia
[3] Public Health Faculty, Universitas Airlangga, Surabaya, Indonesia
[4] Chung Hwa University of Medical Technology, Taiwan

ABSTRACT

Introduction: Nutritional adequacy is essential in ensuring the normal growth and development the fetus. Perceived benefits will be able to strengthen pregnant women to meet optimum nutritional intake to prevent anemia. Adequacy of protein, vitamin C and iron will reduce the risk of iron deficiency anemia in pregnancy. This study aims to examine the association between perceived benefits with protein, vitamin C, and iron intake in preventing pregnancy anemia.

Methods: This study used a cross sectional design and was conducted in August-October 2017 among 105 pregnant women. This study used the multistage random sampling method. The population of this study were pregnant women who had antenatal care in four Community Health Centre in Surabaya namely Jagir, Medokan Ayu, Sidotopo Wetan, and Gundih.

Results: The average daily protein intake was 76.34 (SD = 35.88) gram / day. There was a significant association between perceived benefits with protein intake (r = 0.272; p = 0.005). The average daily vitamin C intake was 90.67 (SD = 116.54) mg / day. There was no significant association between perceived benefits and vitamin C intake (r = 0.175; p = 0.074). The average daily iron intake was 64.73 (SD = 23.13) mg / day. There was a significant association between perceived benefits and iron intake (r = 0.219; p = 0.025).

Conclusion: The knowledge of pregnant women about the benefits of nutrition will affect the adequacy of pregnancy nutrition. Health workers need to provide health education on the importance of nutrition for pregnant women to prevent anemia during pregnancy.

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CONTACT

Mira Triharini
✉ mira-t@fkp.unair.ac.id
Nursing Faculty, Universitas Airlangga, Surabaya, Indonesia

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INTRODUCTION

Nutritional adequacy during pregnancy will affect the condition of the fetus. The incidence of malnutrition in pregnant mothers will lead to fetal development disorders, preterm labor, infant growth disorders, and the risk of development of chronic diseases (Metgud, Naik, & Mallapur, 2012). Preeclampsia and gestational diabetes are also associated with poor nutrition (Acharya et al., 2016; Ahmed & Tseng, 2013). Iron deficiency anemia remains a common problem in pregnancy. A study in the obstetric department of the First Affiliated Hospital of Guangxi Medical University showed that there were more than 70% of pregnant mothers having iron deficiency anemia. That study result showed the incidence of preterm deliveries and low birth weight babies were significantly more in mothers who were anemic in the third trimesters of pregnancy (Huang, Purvarshi, Wang, Zhong, & Tang, 2015).

Several studies have shown factors related to the incidence of maternal anemia (Mekuria, Bekele, Tilahun, & Bekele, 2016; P. Singh, Khan, & Mittal, 2013).Study in Nepal found as many as 41.02% of pregnant mothers had anemia and the prevalence was higher in the second trimester of pregnancy and at the age of 20-35 years(P. Singh et al., 2013). A

research in Southern Ethiopia showed labor spacing of less than two years, iron supplementation, and the number of family members which is more than members two affected the incidence of anemia (Mekuria et al., 2016). Several studies supported the relationship between nutrition and hemoglobin levels (Bahar, 2011; M. B. Singh, Fotedar, & Lakshminarayana, 2009; Thomson et al., 2011).A research in Indonesia showed that maternal education level, nutritional status, and the intake of iron supplement, vitamin C were significantly associated with pregnancy anemia (Bahar, 2011). Research in Indian Western Rajasthan shows the majority of pregnant women have anemia showed a lack of protein and iron (M. B. Singh et al., 2009).

Nutritional problems in pregnant mothers can be caused by the presence of micronutrient interactions. Interactions between micronutrients will affect the absorption and bioavailability, such as the negative effects of calcium on iron absorption, while on the other hand vitamin C will increase the absorption of iron. An understanding of the interactions between micronutrients in nutrient intake is necessary as it will help to reduce the risk of micronutrient deficiency, improve micronutrient status, and reduce the risk of deficiency (Sandström, 2001).

The adequacy of nutritional needs in pregnant mothers will be met if they understand about the importance of nutrition in pregnancy. Knowledge of nutrition in pregnant mother sis influenced by several factors. A study at Gote Geda Woreda, East Wollega Zone, Ethiopia showed that the information on nutrition had a significant relationship with the knowledge of pregnant mothers about nutrition .That study showed women who had information about nutrition were 3.6 times more likely knowledgeable about nutrition as compared to the pregnant women with no information about nutrition during pregnancy (AOR=3.59) (Fekadu Beyene, 2013).The adequacy of protein, vitamin C, and iron in the daily diet of pregnant mothers needs to be considered because it has a role to prevent anemia (Abdelwahid, 2013; Brown & Shapiro, 1996; Rivera-rodriguez, Rodríguez-rivera, Roman-julia, & Raul, 2016; Sriramanakoppa, Sreenivas, & Jayaram, 2015). Pregnant mothers need to be givena health education about foods that contain of protein, vitamin C, and iron during antenatal care.Midwivesplayan important role to improve the understanding ofpregnant mothers (Arrish, Yeatman, & Williamson, 2017).

Health education for pregnant mothers which focus on the perceived benefits about healthy nutrition will improve the nutritional behavior (Khodaveisi, Omidi, Farokhi, & Soltanian, 2017). Currently there are not many studies that see the association between perceived benefits and nutritional intake to prevent anemia. This study aimed to examine the association between perceived benefits and the intake of protein, vitamin C, and iron in preventing pregnancy anemia.

MATERIALS AND METHODS

The population of this study were pregnant mothers who examined the pregnancy in four Community Health Center in Surabaya namely Jagir, Medokan Ayu, Sidotopo Wetan, and Gundih Surabaya. This study used multistage random sampling. This study used a cross sectional design which was conducted in August-October 2017 among105 pregnant mothers. The inclusion criteria were pregnant mothers and those who had obtained iron tablet from Community Health Center. The exclusion criteria were pregnant mothers who had complications that required medical treatment. The data collected in this research included perceived benefits and the intake of protein, vitamin C, and iron. The demographic characteristics questionnaire consists of several questions that include age, parity, education level, income, and gestational age.

The questionnaires of perceived benefits were developed by researchers with items based on the theory of prevention of maternal anemia and the Pender health-promotion model (HPM) (Pender, 2011; Sharma & Shankar, 2010). Whilst preparing the questionnaire contents, the researchers were assisted by two experienced nurses in the field of maternity nursing. Translation was accomplished by a qualified translator from Indonesia. Perceived benefits were measured using a questionnaire based on Health Promotion Model theory and anemia theory (Sharma & Shankar 2010; Pender 2011). Before use in data collection, the compiled questionnaires were tested for validity and reliability on 15 pregnant women who attended antenatal care at the Community Health Centre of Keputih Surabaya. The questionnaire consists of six questions. The Cronbach's α was 0.911. The six questions featured a Likert scale with the following option strongly agree, slightly agree, hesitate, slightly disagree, strongly disagree.

Measurement of the intake of protein, vitamin C, and iron was done by 1 x 24 hours of food recall method in which the result was expressed in grams and mg (Supariasa, Bakri, & Fajar, 2002). Sample recruited was conducted after obtaining ethical approval from health research ethics committee of Faculty of Public Health Airlangga University Surabaya Indonesia (No 123-KEPK). Informed consent was obtained after pregnant mothers agree to participate in this research. Data analysis using spearman's rho was used to determine the association between the perceived benefits and the intake of protein, vitamin C and iron. Descriptive statistics used frequency, percentage, mean and standard deviation to identify demographic characteristics, perceived benefits, and nutritional intake. The level of significance used alpha 0.05. The p value <0.05 indicated a significance. All data were analyzed using SPSS software.

RESULTS

Table 1 shows the socio demographic characteristics and nutrition intake of protein, vitamin C, and iron. The majority of respondents (n = 73, 68%) were 25-35 years old. Most of respondents (n = 73, 69.5%) had parity 1-3. Most of respondents (n = 81, 77.1%) had secondary education. The majority of respondents (n = 72, 68.6%) had an income below 3 million rupiah per month. Most of the respondents (n = 88, 83.8%) had gestational age below 37 weeks.

The greatest protein intake was in age 25-35 years (79.82 ± 38.09), parity was> 3 (93.90 ± 125.31), elementary education (79.04 ± 61.54), income was ≥ 3 million rupiah (80.56 ± 44.76), and gestational age was ≥ 37 weeks 81.02 ± 36.36). The greatest vitamin C intake was in age> 35 years (102.15 ± 130.03), parity was> 3 (209.70 ± 176.35), university education (116.58 ± 156.27), income was ≥ 3 million rupiah (101.42 ± 139.76) and gestational age was ≥ 37 weeks 81.02 ± 186.05). The greatest iron intake was in age > 35 years (66.11 ± 15.87), nullipara (322.3 ± 112.8), university education (65.42 ± 9.67), income was <3 million rupiah (65.81 ± 24.14) and gestational age was ≥ 37 weeks 71.98 ± 10.11).

From five statements about the perceived benefits, the statement of "Consumption of nutritious and high iron will make the baby healthy" has the highest score (4.48 ± 0.54) and "Regular consumption of iron tablets can prevent infection" has the lowest score (4.10 ± 0.74) (Table 2).

The average score of perceived benefits was 25.64 (95% CI 25.08-26.20). The average protein intake of the study population was 76.34 (SD = 35.88) g/day. This was equivalent to 99.14 per cent of RDA recommended value for pregnant mothers in this population. There was a significant association between perceived benefits and the protein intake with positive and moderate association (r = 0.272; p

Table 1. Nutrition Intake in Pregnant Mothers (N=105)

No	n(%)	Protein (gram/day)		Vitamin C (mg/day)		Iron (mg/day)	
		Mean	SD	Mean	SD	Mean	SD
Age							
< 25 years	25 (23.8)	67.07	30.01	67.78	78.43	63.86	26.93
25-35 years	73 (69.5)	79.82	38.09	102.15	130.03	64.89	22.58
> 35 years	7 (6.7)	73.16	27.99	52.67	49.27	66.11	15.87
Parity							
0	30 (28.6)	73.77	35.31	106.49	119.33	65.14	26.07
1-3	73 (69.5)	76.92	36.56	80.91	113.38	64.64	22.01
>3	2 (1.9)	93.90	25.31	209.70	176.35	61.95	32.46
Education							
Elementary	14 (13.3)	77.49	31.76	115.25	166.31	65.26	33.86
Secondary	81 (77.1)	75.81	32.89	83.22	100.83	64.55	22.34
University	10 (9.5)	79.04	61.54	116.58	156.27	65.42	9.67
Income (Rupiah)							
< 3 million	72 (68.6)	74.40	31.15	85.75	104.94	65.81	24.14
≥ 3 million	33 (31.4)	80.56	44.76	101.42	139.76	62.37	20.94
Gestasional age							
< 37 week	88 (83.8)	75.44	35.92	80.31	95.91	63.33	24.67
≥ 37 week	17 (16.2)	81.02	36.36	144.30	186.05	71.98	10.11

Note: 13.500 rupiahs equal to 1 US $

Table 2. Items of Perceived Benefits Analysis (N=105)

No	Items	Mean	SD
1	Consumption of nutritious foods and highiron will make the baby healthy	4.48	0.54
2	Consumption of nutritious foods and highironwill make deliveries smooth	4.29	0.63
3	Regular consumption of iron tablets will make mothers become not quickly tired	4.24	0.69
4	Regular consumption of irontabletscan prevent infection	4.10	0.74
5	Washing hands before eating is important in preventing anemia of pregnant mothers	4.18	0.83
6	Using footwear when out of home is necessary for the health of pregnancy	4.36	0.69

Table 3. The Relationship between Perceived Benefits and Nutritional Intake (N=105)

No	Variable	Mean	SD	RDA value	% of RDA Value	Min-Max	r	p-value
1	Perceived benefits	25.64	2.89			19-30		
2	Protein (gram)	76.34	35.88	77	99.14	76.34-250.9	0.272	0.005
3	Vitamin C (milligram)	90.67	116.54	85	106.67	0.8-629.7	0.175	0.074
4	Iron (milligram)	64.73	23.13	126	51.37	9.6-125.3	0.219	0.025

SD - Standard Deviation; RDA: Recommended Dietary Allowance; r = Spearman correlation coefficient; p< 0.05

= 0.005). The average of vitamin C intake of the study population was 90.67 (SD = 116.54) mg/day. This was equivalent to 106.67 per cent of RDA recommended value for pregnant mothers in this population. There was no significant association between perceived benefits and vitamin C intake (r = 0.175; p = 0.074). The average of iron intake of the study population was 64.73 (SD = 23.13) mg/day. This was equivalent to 51.37 per cent of RDA recommended value for pregnant mothers in this population. There was a significant association between perceived benefits and iron intake with possitive and weak association (r = 0.219; p = 0.025) (Table 3).

DISCUSSION

The result of this study found that the statement of "Consumption of nutritious foods and high iron will make the baby healthy" had the highest score, while the statement of "Regular consumption of iron tablets can prevent infection" had the lowest score. The knowledge of pregnant mothers about the prevention of anemia had been obtained by mothers through health education from healthcare providers during antenatal care, as well as from the mass media. Pregnant mothers had understood the benefits of eating nutritious foods but had not fully figured out the benefits of the adherence to iron supplementation. There were still many pregnant mothers who did not adhere to taking iron supplementation although iron supplements have been shown to increase the levels of hemoglobin to prevent the occurrence of anemia (Sajith et al., 2016). Iron supplements need to be taken regularly by every pregnant mother every day during her pregnancy or at least 90 tablets. Daily oral iron supplementation with 60 mg of elemental iron and 0.4 mg folic acid (Health Ministry of health, 2014).

The adequacy of nutrients during pregnancy will contribute greatly to the health of the fetus and the well-being of pregnant mothers. However, the result of the study found that many pregnant mothers having not received adequate nutrition were those who were among the group of underweight or overweight/obese, smokers, adolescents, and those with previous unfavorable pregnancy outcomes (Marangoni et al., 2016). Underweight conditions during pregnancy are associated with poor fetal development, preterm, and an increased risk of chronic disease later in life, while pregnant mothers will be at risk of gestational diabetes and preeclampsia (Ahmed & Tseng, 2013).

Food recall in this study showed that the intake of protein and vitamin C in this population was in good category but the intake of iron was still in the low category. The adequacy of iron in the diet is influenced by maternal adherence to Fe supplements. Each iron supplement for pregnant mothers at least containing iron that was equivalent to 60 mg of iron elements (in the form of Ferro Sulfate, Ferro Fumarate or Ferro Gluconate) preparations; and Folic Acid 0.400 mg (Health Ministry of health, 2014).Some studies supported the low iron adequacy in pregnant mothers (Mosha et al., 2017; Sato, Fujimori, Szarfarc, Borges, & Tsunechiro, 2010). The inadequacy of iron in the diet in this population might be influenced by the respondent's characteristics with the lowest mean intake of iron with more than 3 parities. The majority of respondents in this study had income less than 3 million. The provision of food in the family is closely related to the appetite of other family members and the priority of financial use. A study supported the relationship between socioeconomic and dietary patterns in pregnant mothers. A study showed the mother with higher level of financial resources to buy food, has higher consumption of saltwater fish, fruit, products being the source of animal protein (Suliga, 2013; Völgyi et al., 2013).

The result showed a significant association between the perceived benefits and the intake of protein and iron. Perceived benefits of actions reinforce consequences for certain health behaviors. Perceived benefits can increase individual's commitment in conducting health behavior. Perceived benefit is a concept of Pender Health Promotion Model that supports 6 major components of healthy lifestyle. These components include health responsibility, physical activity, nutrition, spiritual growth, interpersonal support and stress management (Eshah, Bond, & Sivarajan, 2010).The results of several studies supported that perceived benefits can improve health behavior in various areas (Kim, Ahn, & No, 2012; Lovell, Ansari, & Parker, 2010; Noroozi, Esmaili, Tahmasebi, & Vahdat, 2017; Salahshoori, Sharifirad, Hassanzadeh, & Mostafavi, 2014). In this study perceived benefits were associated with the prevention behavior of anemia during pregnancy. Pregnant women with good perceived benefits will try to meet the daily nutritional adequacy despite the obstacles experienced.

Pregnant mothers can experience many obstacles in fulfilling daily nutritional needs. A study of iron supplementation showed that the majority of pregnant mothers suffered from gastrointestinal disorders such as nausea, diarrhea and constipation (Tolkien, Stecher, Mander, Pereira, & Powell, 2015).A study looked at the perception of anemia pregnancy and its prevention in several countries. That study showed Pregnant mothers in Bolivia, Guatemala, and Honduras had realized that the consequences of anemia were serious and anemia can be fatal for both mother and baby. Result that study in Indonesia showed that anemia was equal to the term low blood pressure. Some pregnant mothers stated that consumption of iron supplements would increase blood and was associated with hypertension (Galloway et al., 2002). The difference in perceptions of pregnant women about anemia shows the importance of health education about anemia to

improve anemia prevention behavior in pregnant women.

CONCLUSION

The finding from this study has confirm that mother with good perception on benefits will have better intake of protein and iron in pregnant mothers. Health workers need to provide health education to every pregnant woman to increase the perceived benefits of preventing anemia. A good understanding of the importance of prevention of anemia, will improve the behavior of mothers in fulfilling daily nutritional needs, especially protein, vitamin C and iron.

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Original Research

HIV/AIDS-Related Knowledge and Willingness to Participate in Voluntary Counseling and Testing among Health Sciences University Students

Ni Putu Wulan Purnama Sari[1] and Anselmus Aristo Parut[2]

[1] Faculty of Nursing, Widya Mandala Catholic University Surabaya, East Java, Indonesia
[2] Department of Nursing, Institute of Health Science Bali, Indonesia

ABSTRACT

Introduction: Health sciences university students (HSUS) are susceptible to HIV infection due to frequent contact with patients whose HIV status is unknown. This study aimed to compare the HIV/AIDS-related knowledge and the willingness to participate in VCT among HSUS, analyzing the differences between groups, and correlation and effect between variables.

Methods: This cross-sectional study involved 357 HSUS from the faculty of nursing, pharmacy, psychology and medicine at an accredited university. Samples were selected using simple random sampling. Data analysis used descriptive statistic, Pearson correlation, one-way ANOVA test, and linear regression test (α<0.05).

Results: Most respondents were 20-21 years old single female who still live with parents, exposed to HIV/AIDS material twice/more via academic activities; lack of HIV/AIDS-related knowledge (51.5%), highest mean found in medical students (73.1%); willing enough to participate in VCT (83.5%), highest mean found in nursing students (86.4%). No correlation found between variables (p=0.101), and the regression model was not significant (p=0.101). HIV/AIDS-related knowledge contributed only 0.8% influence on the willingness to participate in VCT among HSUS (R2=0.008), other unidentified factors possibly play a more important role.

Conclusion: Beside knowledge, other factors like demographic factors, social determinants, close person, health education, fear, and HIV-related stigma may affect the willingness to participate in VCT among HSUS HSUS's knowledge about HIV/AIDS was low but their willingness to participate in VCT was quite high. HIV/AIDS-related knowledge has a slight contribution in determining HSUS's willingness to participate in VCT. Further analysis of other potential factors is needed to determine stronger predictors.

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CONTACT

Ni Putu Wulan Purnama Sari
✉wulanpurnama@ukwms.ac.id
Faculty of Nursing, Widya Mandala Catholic University Surabaya, East Java, Indonesia

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INTRODUCTION

Young generations of both men and women aged 15-24 are particularly vulnerable to infection with the HIV because young people / teenagers are in the experimental phase including in sexual matters (Moore, 2000). Students are particularly vulnerable to HIV infection due to lack of knowledge and also lack of parental supervision, especially students living far away from parents, giving them the opportunity to try new things including the sex experience (Shiferaw, 2014). Health sciences university students (HSUS) are even more susceptible to HIV infection due to frequent contact with patients whose HIV status is unknown, especially in a clinical setting.

Globally, there were approximately 36.9 million people living with HIV at the end of 2017 with 1.8 million people becoming newly infected and 940,000 people died from HIV-related causes (WHO, 2018). In Indonesia, the data from Directorate General of Disease Control and Environmental Health of Ministry of Health (MOH, 2017) showed that from January to April 2017 there were new cases of HIV found amounted to 10,376 and new cases of AIDS amounted to 673 individuals. The highest prevalence

of HIV was in the age group of 25-49 years old (69.6%), followed by a group of 20-24 years old (17.6%), and a group of ≥ 50 years old (6.7%). The highest prevalence of AIDS was in the age group of 30-39 years old (38.6%), followed by a group of 20-29 years old (29.3%), and a group of 40-49 years old (16.5%). The proportion of male: female for HIV/AIDS was 2:1 (MOH, 2017).

Since last quarter of 2015 until now, WHO in collaboration with four top universities in Indonesia (Udayana University, Gadjah Mada University, Padjadjaran University, and Atma Jaya Catholic University of Indonesia) established and implemented the HATI study (HIV Awal/Early Test and Treatment Indonesia). The objective is to evaluate the feasibility of interventions aimed at increasing HIV testing and immediate Anti Retroviral Therapy (ART) initiation in key populations in Indonesia, including men who have sex with men (MSM), female sex workers (FSW), waria (shemale or ladyboy) and people who inject drugs (PWID). Unfortunately, young generation in term of university students especially HSUS was not considered as key population, therefore was not included in those study (WHO, 2018).

Men and women are equally likely to be infected with HIV, due to a lack of knowledge about HIV / AIDS and prevention of transmission. Based on the Basic Health Research data, only 13% of youth / adolescent girls and 12% of youth / adolescent boys have comprehensive knowledge about HIV / AIDS, while the Millennium Development Goals (MDGs) target for youth knowledge is 95% (Central Bureau Statistic, 2012). Understanding how the mechanism of HIV transmission is the first step in the process of controlling or preventing HIV / AIDS infection.

Voluntary Counseling and Testing (VCT), Provider Initiating Test and Counseling (PITC), and Home-based HIV Counseling and Testing (HBCT) are the means by which people can know their HIV status. HBCT offers a novel approach to complement facility-based PITC and VCT, and could greatly increase HIV prevention opportunities (Kimaiyo, et al, 2010). VCT is one method that is quite effective in reducing and controlling HIV transmission. VCT is the key entry point to prevention, care, treatment and support services, where people learn whether they are infected or not and to understand the implications of their HIV status and make informed choices for the future (Tsegay, et al, 2013). A study conducted by the World Health Organization (WHO, 2004) revealed that the number of people who do VCT is very low in countries with high HIV / AIDS cases. It is estimated that currently only 75% of people with HIV know their status (WHO, 2018).

Availability of access to VCT and public awareness of VCT are keys so that patients with HIV/AIDS receive antiretroviral therapy (ART), and prevent transmission with behavioural changes. Counselling is designed to assist patients in interpreting the results of laboratory tests, to change behaviour aiming at prevention of HIV infection and transmission. One area that is the focus of WHO nowadays is testing and counselling which greatly play a role as the entrance of preventive and treatment stages (WHO, 2004).

The main targets of a national strategy for sexual and reproductive education are to increase youth knowledge about reproductive health and safe sex, to promote and facilitate changes in young people's behaviour, including raising awareness about respect for others, and the ultimate goal is to provide young people with comprehensive knowledge, and motivation for good behaviour especially related to reproductive health (National AIDS Commission, 2009). Young people especially HSUS have increased susceptibility to HIV infection due to age, low parental supervision, frequent contacts with patients whose HIV status is unknown, and several other factors. This study aimed to compare the HIV/AIDS-related knowledge and the willingness to participate in VCT among HSUS, analyzing the differences between groups, and correlation & effect between variables.

MATERIALS AND METHODS

This study used a cross-sectional design. This design was implemented because it will produce a prevalence or effect of a phenomenon that is associated with a particular cause (Nursalam, 2008). In the context of this study, the research team conducted a health survey at an accredited university in Surabaya, Indonesia. Self-administered questionnaires were used for data collection. The target population was HSUS who were active in even semester of 2016/2017 academic year. Inclusion criteria were age ≥ 18 years old and willing to be respondent proved by informed consent. The sample size was 357 generated by specific formula measurement for known population size as proposed by Nursalam (2008). Simple random sampling was implemented. There were137 nursing students, 115 psychology students, 71 pharmacy students, and 34 medical students became study respondents (4 groups of students).

The independent variable was the HIV-related knowledge assessed with the KQ-18 instrument (Carey & Schroder, 2002). The KQ-18 instrument initially consisted of 45 items developed by Carey, Morrison-Beedy and Johnson (1977), then taken only 18 items by Carey & Schroder (2002) and was named KQ-18 after instrument testing procedure. The answer choices are right, wrong, and no idea. Each correct answer will be given a score of 5.55; score range was 0-100. The result of instrument retesting to 42 university students in Surabaya showed only 4 valid items with r = -0.333 - 0.336, and medium reliability with Chronbach Alpha = 0.588. The researcher team decided to keep using the 18 items of KQ-18 because very few valid items indicated low levels of knowledge. The data scale was an interval, but to ease the data presentation in results section then the data of knowledge was

categorized into three knowledge level: 1) low (total score 0-49), 2) sufficient (total score 50-74), and 3) high (total score 75-100).

The dependent variable was the willingness to participate in VCT assessed by the General Attitudes to VCT instrument (Mwangi, et al, 2014). This instrument was originally developed by Boshamer & Bruce (1999) and Peltzer & Mpofu (2002); then later revised by Mwangi, et al (2014). Initially the instrument consisted of 41 items in the Likert scale format that examined 5 determinants of attitudes toward HIV testing that could indicate a person's willingness to participate in VCT, namely: 1) self-perception and community, 2) assumptions of friends, 3) values related to HIV testing, 4) support and confidence, and 5) self-perceived vulnerability. Response ranges provided were strongly disagree (score 1), disagree (score 2), relatively agree (score 3), agree (score 4), and strongly agree (score 5). Score range was 32-160. Instrument testing in Kenya showed that there were 9 invalid items, so formed a new instrument consisting of 32 items. Instrument retesting to 42 university students in Surabaya showed only 18 valid items with r = 0.295 - 0.671, and high reliability with Chronbach Alpha = 0.728. The researcher team decided to keep using the 32 items to maintain the integrity of the attitude domain so that comprehensive data could be obtained. The data scale was interval, but to ease the data presentation in results section then the data of willingness to participate in VCT was categorized into three willingness level: 1) less/low (total score 32-74), 2) enough/sufficient (total score 75-117), and 3) greatly/high (total score 118-160).

Ethical clearance issued by the Faculty of Nursing, Universitas Airlangga, Surabaya (Certificate Number 360-KEPK). Other ethical aspects included informed consent, anonymity, and confidentiality. There was no conflict of interest between authors and study funder regarding this study and publication. Before filling out the questionnaires, the respondents were given an explanation of the purpose and benefits of the study then they were asked to sign the informed consent sheet. Researcher acted as a facilitator during the data collection process. Data analysis used descriptive statistic, Pearson correlation test, one-way ANOVA test, and linear regression test ($\alpha<0.05$).

RESULTS

Table 1. Demography characteristic (n = 357)

Characteristic	Faculty of Nursing*		Faculty of Pharmacy		Faculty of Psychology		Faculty Medicine	
	Frequency (n=137)	Percentage (%)	Frequency (n=71)	Percentage (%)	Frequency (n=115)	Percentage (%)	Frequency (n=34)	Percentage (%)
Age (years old)								
18	11	8.03	3	4.23	9	7.83	0	0
19	26	18.98	9	12.68	37	32.17	1	2.94
20	38	27.74	18	25.35	29	25.22	8	23.53
21	37	7.01	22	30.99	23	32.39	18	58.06
22	17	12.41	14	19.72	7	6.09	4	11.76
>22	8	5.84	5	7.04	10	8.70	2	5.88
Gender								
Male	25	18.25	19	26.76	28	24.35	8	23.53
Female	112	81.75	52	73.24	87	75.65	26	76.47
Religion								
Catholic	60	43.80	25	35.21	39	33.91	14	41.18
Christian	34	24.82	23	32.39	53	46.09	13	38.24
Islam	40	29.20	22	30.99	20	17.39	7	20.59
Others	3	2.19	1	1.41	3	2.61	0	0
Ethnic origins								
Java, Sunda, Madura	62	44.53	52	73.24	61	53.04	12	35.29
Batak, Padang, Mentawai	4	2.92	2	2.82	4	3.48	0	0
Chinese	1	1.46	7	9.86	31	26.96	10	29.41
Bali, Dayak, Toraja	11	8.03	5	7.04	9	7.83	5	14.71
NTT, Maluku, Papua	42	30.66	5	7.04	10	8.70	7	20.59
Others	17	12.41	0	0	0	0	0	0
High School Location								
Surabaya	42	30.66	46	64.79	66	57.39	17	50.00
East Java outside Surabaya	23	16.79	11	15.49	26	22.61	7	20.59
Java outside East Java	2	1.46	2	2.82	4	3.48	3	8.82
Outside Java	70	51.09	12	16.90	19	8.70	7	20.59

Marital status								
Single	107	78.10	52	73.24	80	69.57	27	79.41
In a relationship	28	20.44	18	25.35	35	30.43	7	20.59
Married	2	1.46	1	1.41	0	0	0	0
Living with								
Parents	52	37.96	28	39.44	62	53.91	15	44.18
Sibling	5	3.65	2	2.82	7	6.09	1	2.94
Extended family	21	15.33	4	5.63	17	14.78	4	11.76
Friends	20	14.60	15	21.13	12	10.43	1	2.94
Alone	38	27.74	19	26.76	11	9.57	13	38.24
Spouse	1	0.73	0	0	0	0	0	0
Others	0	0	3	4.23	6	5.22	0	0
Parents monthly income (IDR)								
500,000 – 1 million	6	4.38	0	0	1	0.87	0	0
> 1 – 3 million	91	66.42	48	67.61	66	57.39	0	0
> 3 – 5 million	25	18.23	19	26.76	35	30.43	4	11.76
> 5 million	13	9.49	4	5.63	12	10.43	30	88.24
None	2	1.46	0	0	0	0	0	0

*Study result of Nursing Faculty referred to Sari & Parut (2017).

Table 2. Primary Data

Characteristic	Faculty of Nursing*		Faculty of Pharmacy		Faculty of Psychology		Faculty Medicine	
	Frequency (n=137)	Percentage (%)	Frequency (n=71)	Percentage (%)	Frequency (n=115)	Percentage (%)	Frequency (n=34)	Percentage (%)
Exposure to HIV/AIDS material								
Never	9	6.57	7	9.86	22	19.13	1	2.94
Once	41	29.93	14	19.72	41	35.65	7	20.59
Twice or more	87	63.50	50	70.42	52	45.22	26	76.47
Media of Information**								
Printed media (book, journal, poster, etc)	13	9.49	20	28.17	16	13.91	2	5.88
Electronic media (social media, TV, etc)	46	33.58	33	46.48	33	28.70	10	29.41
Academic activity (class, lecture)	49	35.77	58	81.69	34	29.57	34	100.00
Seminar/*workshop*	58	42.34	19	26.76	54	46.96	13	38.24
Student activities (non-curricular)	4	2.92	1	1.41	8	6.96	0	0
Close person (family, friend, teacher, etc)	28	20.44	15	21.13	16	13.91	2	5.88
Health education from health care professional (hospital, primary care unit, etc)	43	31.39	10	14.08	19	16.52	2	5.88
HIV/AIDS-related knowledge***								
High	8	5.84	4	5.63	0	0	20	58.82
Sufficient	63	45.99	39	54.93	28	24.35	11	32.35
Low	66	48.18	28	39.44	87	75.65	3	8.82
The willingness to participate in VCT***								
Greatly/high	3	2.19	0	0	0	0	1	2.94
Enough/sufficient	121	88.32	57	80.28	92	80.00	28	82.35
Less/low	13	9.49	14	19.72	23	20.00	5	14.71

* Study result of Nursing Faculty referred to Sari & Parut (2017).

** Respondents were allowed to choose more than 1 answer.

*** This category was made in order to ease the data presentation, and not for purposes of statistical analysis.

Most respondents were 2nd-year students (54.90%), except for nursing students which mostly were freshmen. Table 1 showed that in total the majority of respondents were aged 20-21 years old (54.06%) except Psychology Faculty (19 years), female sexuality (77.59%), single / unmarried / not in any relationship (74.51%), Catholic (38.66%) except Psychology Faculty (Christian), Javanese (52.38%),

Table 3. Descriptive Statistics

Faculty	N	HIV/AIDS-related knowledge		Willingness to participate in VCT	
		Mean	SD	Mean	SD
Nursing	137	50.14	17.19	86.37	10.60
Pharmacy	71	43.23	17.30	81.99	10.24
Psychology	115	47.20	17.05	81.98	9.57
Medicine	34	73.12	19.08	83.35	15.26

Table 4. Least Significant Difference (LSD) Test Results: multiple comparison

Faculty	Nursing	Pharmacy	Psychology	Medicine
HIV/AIDS-related Knowledge				
Nursing	0.000	0.007	0.182	0.000
Pharmacy	0.007	0.000	0.130	0.000
Psychology	0.182	0.130	0.000	0.000
Medicine	0.000	0.000	0.000	0.000
The Willingness to participate in VCT				
Nursing	0.000	0.006	0.001	0.143
Pharmacy	0.006	0.000	0.998	0.542
Psychology	0.001	0.998	0.000	0.514
Medicine	0.143	0.542	0.514	0.000

high school alumni of HS in Surabaya (47.90%) except Nursing Faculty (HS of outside Java), living with parents (43.98%), and total parent's income per month more than IDR 1 - 3 million (57.42%) except medical students (> IDR 5 million).

Table 2 showed that in total the majority of respondents had been exposed to HIV / AIDS material twice or more (59.94%). The majority of media used by respondents to obtain health information about HIV / AIDS was seminar / workshop activity for students of Faculty of Nursing and Psychology (44.44%), while through academic activities for students of Faculty of Pharmacy and Medicine (87.62%).

Most respondents of Medical Faculty possess high HIV/AIDS-related knowledge (58.82%). Table 3 showed that the highest Mean of HIV/AIDS-related knowledge was found in Medical Faculty (73.12 or sufficient), but the data is the most varied among all (SD=19.08). Majority of low HIV/AIDS-related knowledge was found in the Faculty of Nursing and Psychology (48.18% and 75.65% respectively). All data of HIV/AIDS-related knowledge was normally distributed (p = 0.138-0.719), except Faculty of Nursing (p = 0.014). Most respondents were willing enough to participate in VCT (83.47% in total). Table 3 also showed that the highest Mean of the willingness to participate in VCT was found in Faculty of Nursing (86.37 or sufficient), but the least varied data was found in Faculty of Psychology (SD=9.57). All data of the willingness to participate in VCT was normally distributed (p = 0.091-0.963).

Data variance was homogeneous for both variables (p = 0.527-0.817). The data of HIV/AIDS-related knowledge was linear to the data of the willingness to participate in VCT (p = 0.597). Therefore parametric test may be used for data analysis (Pearson correlation test, one-way ANOVA test, and linear regression test). The result of the Pearson correlation test showed that there was no correlation found between HIV/AIDS-related knowledge and the willingness to participate in VCT among HSUS (p = 0.101). Therefore there was no strong basis for pursuing linear regression analysis since this is an important assumption for the use of regression analysis. But, researchers need to make sure that HIV/AIDS-related knowledge even has no slight influence on the willingness to participate in VCT. Results turned out to the model of regression [Y (willingness) = 86.288 – 0.050 X (knowledge)] was not significant (p=0.101). HIV/AIDS-related knowledge contributed only 0.8% influence on the willingness to participate in VCT among HSUS (R2=0.008), other unidentified factors possibly play a more important role.

The result of one-way ANOVA test showed that significant differences found among four groups of HSUS regarding measured variables (p < 0.05), therefore LSD test was needed to specifically found those differences.

Table 4 showed that there was no significant difference of HIV/AIDS-related knowledge found between nursing and psychology students (p = 0.182), but this knowledge was significantly different with pharmacy and medical students (p = 0.007 and p = 0.000 respectively). Knowledge of medical students was significantly different among the other faculties (p = 0.000 for each). Also, there was no significant difference in the willingness to participate in VCT found between medical students and the other faculties (p = 0.143 – 0.542). Nursing students' willingness to participate in VCT was significantly different with pharmacy and psychology students (p = 0.006 and p = 0.001 respectively).

DISCUSSION

Table 1 showed that most respondents were aged 20-21 years (54.06%). Adolescents aged 15-24 are vulnerable to HIV infection due to the strong influence of peer pressure and the development of their sexual and social identity that often culminates in experiments (Shiferaw, 2014). The majority of young people in this age group are at risk of HIV

infection due to their involvement in unsafe sex, injecting drug use, blood exposure and viral contaminated blood products or unsterile piercing procedures (WHO, 2004). A descriptive study in Kenya proved that age is associated with the implementation of HIV testing (Mugoya, 2012).

Table 1 showed that most respondents were females (77.59%). Studies in Kenya showed that there were significant differences between men and women in previous HIV testing status and HIV testing. HIV knowledge is higher in men than women. Differences are found in stigma against HIV, with women reporting more stigmatization stance than men (Mugoya, 2012). VCT participants were more likely to be men in Namibia (Soroses, 2006). Men were relatively more likely to take HIV testing than women through VCT in rural Ethiopia (Teklehaimanot, et al, 2016). In this study, differences in knowledge about HIV / AIDS among male and female respondents were not analyzed further, given the proportion of male-to-female samples is highly imbalanced.

Table 1 showed that most respondents are single (78.10% in total). Marital status was found to be associated with VCT participation in Namibia (Soroses, 2006). The pattern of behaviour change seems to be consistent with marital status (Oster, 2012). Premarital sex among unmarried couples and high prevalence of HIV among men is associated with a willingness to be tested for HIV (Wang, et al, 2010). Only 2.52% of unmarried respondents ever had premarital sex in this study.

Table 1 showed that the study respondents vary in terms of ethnic and religious affiliation. In addition to gender, ethnicity and religion can affect the stigma against HIV that potentially affects willingness to participate in VCT. Study in Namibia showed that cultural groups are significantly associated with VCT participation (Soroses, 2006); while another study in Burkina Paso showed that Bwaba ethnicity was significantly associated with high HIV risk (Sarker, et al, 2005). The broad cultural norms surrounding gender and stigma against HIV influence the behaviour of HIV testing and diagnosis seeking behaviour from marginalized risk populations (Lofquist, 2012). Cultural group or ethnic need to be further studied in connection to VCT utilization, especially in the developing country.

Table 1 showed that most respondents completed their primary education outside Java (30.25% in total). A cross-sectional study in rural Ethiopia showed that behavioural factors and health services affect the utilization of VCT in rural people. Rural people who are better educated and have comprehensive knowledge without stigmatization are more likely to be willing to utilize VCT. The origin of the state or province is also strongly associated with the utilization of VCT in both men and women (Teklehaimanot, et al, 2016).

Table 1 showed that most respondents still live with their parents (43.98% in total). University students are particularly vulnerable to HIV infection due to lack of knowledge and lack of parental supervision. Students who stay away from their parents have the potential to have more opportunities to try new things, including the sex experience (Shiferaw, 2014). If most of the study respondents are still living with their parents currently, it can be assumed that the respondents still get enough parental supervision. Therefore the possibility to experience premarital sexual activity is less; only 2.52% respondents reported premarital sex.

All respondents were not working at the time of data collection, not even being a part-timer. Most of their time was spent on campus. The main financial supporters were their parents. Individuals who have households with high socioeconomic status and work in non-agricultural sectors are more likely to use VCT (Teklehaimanot, et al, 2016). Table 1 shows that most respondent parents earn a monthly salary of IDR 1-3 million (57.42% in total, with the type of occupation, was not identified). This is below the regional minimum wage of Surabaya in 2017 (IDR 3.2 million). The residential status of respondents is mostly self-owned (46.78% in total). It can be assumed that the socio-economic or social status of the study respondents is lower middle-class. This can affect the accessibility of VCT information and services that have the potency to cause fear and stigma against HIV in the community.

Table 2 showed that most respondents experienced health education of HIV/AIDS twice or more so far (59.94% in total). The seminar/workshop proved to be the easiest way to obtain HIV/AIDS-related knowledge among nursing and psychology students (44.44%) and via academic activities for pharmacy and medical students (87.62%). Only 20.73% of respondents received health education from a health care professional. HIV-related topics were covered in their academic syllabus but in the different portion for each study program; medical students got more credits for HIV-related topic, followed by the pharmacy, nursing, and psychology students. This is confirmed by the results presented in Table 3a which showed that the highest Mean of HIV/AIDS-related knowledge was found in Medical Faculty (73.12). Majority of low HIV/AIDS-related knowledge was found in the Faculty of Nursing and Psychology (48.18% and 75.65% respectively). These two faculties need to more encourage HIV-related topics in their academic syllabus.

A study at Debre Markos University, North West Ethiopia (2011), showed that knowledge of HIV, suspected stigma, perceptions of risk, and having heard of the secrecy aspect in VCT were associated with the use of VCT services among students. Their main sources of information are mass media and health care workers (Tsegay, et al, 2013). Information on HIV is most likely to be more effective if disseminated through mass media (printed or electronics) based on Tsegay's study (2013) compared to health education activities alone

because of the scope and accessibility of young people today. Dissemination of information mainly due to the asymptomatic nature of HIV infection has the potential to be very important in shaping the perceptions of risk, awareness, and willingness to participate in HIV testing (Sarker, et al, 2005).

Most respondents were willing enough to participate in VCT (83.47% in total). Table 3b showed that the highest Mean of the willingness to participate in VCT was found in Faculty of Nursing (86.37). VCT proves to be one of the most powerful weapons to stop the spread of HIV / AIDS. VCT is known to be a very important component of HIV/AIDS prevention strategies, but some studies show low use of VCT services especially in developing countries (Tsegay, et al, 2013). Several studies have also shown that knowledge of HIV is often associated with the individual's desire to participate in VCT. Table 2 showed that 51.54% of respondents have low HIV knowledge (in total), although most claimed to have been exposed to health education about twice or more so far. Table 2 showed that only 1.12% of respondents indicated a strong willingness (greatly) to participate in VCT. This is potentially due to low knowledge (51.54%), fear of HIV testing (expressed) and possible stigma against HIV. Students who are knowledgeable about HIV have a 3.69 times higher likelihood of using VCT services than those without or less knowledge (Tsegay, et al, 2013). A study in KwaZulu-Natal, South Africa, showed that despite having a very good knowledge of HIV, a large number of patients referred for VCT did not perform HIV testing at the end (Orisakwe et al., 2012). This is consistent with this study finding as shown in Table 4 that no correlation found between HIV/AIDS-related knowledge and the willingness to participate in VCT among HSUS ($p = .101$).

Results showed that significant differences found among the four groups of HSUS regarding HIV-related knowledge and the willingness to participate in VCT ($p = 0.000$ and $p = 0.005$ respectively). This result was confirmed in Table 4. Table 4a showed that there was no significant difference of HIV/AIDS-related knowledge found between nursing and psychology students ($p = 0.182$), but this knowledge was significantly different with pharmacy and medical students ($p = 0.007$ and $p = 0.000$ respectively). Knowledge of medical students was significantly different among the other faculties ($p = 0.000$ for each). However as shown in Table 4b, it was shown that there was no significant difference in the willingness to participate in VCT found between medical students and the other faculties ($p = 0.143 – 0.542$). Nursing students' willingness to participate in VCT was significantly different with pharmacy and psychology students ($p = 0.006$ and $p = 0.001$ respectively).

Results also showed that there was no correlation found between HIV/AIDS-related knowledge and the willingness to participate in VCT among HSUS ($p = 0.101$). One reasonable explanation is that the knowledge level is very low for most except for medical students, and the willingness result is not as varied. This result was found because knowledge only contributed 0.8% influence in determining HSUS willingness to participate in VCT, as confirmed by linear regression test results which showed that knowledge of HIV/AIDS has very slight influence/effect on the willingness to participate in VCT among HSUS ($R2 = 0.008$; it means 0.8% influence); 51.54% respondents in total possess low HIV/AIDS-related knowledge and 15.41% respondents in total have low willingness to participate in VCT.

A cross-sectional study in Northeastern China supports this finding, where greater knowledge about HIV transmission and the awareness that apparently healthy people can transmit HIV significantly associated with greater willingness to participate in free HIV testing (Yuan et al, 2012). Another descriptive study utilizing data from the Demographic Health Survey in Kenya in 2009/2010 also showed that knowledge of HIV, knowing someone who is infected with HIV/AIDS, and education level was positively associated with the use of HIV testing services and HIV-related stigma (Mugoya, 2012). Stigma potentially became one of the key factors determining a person's willingness to participate in VCT, especially in young people, but unidentified in this study; 99.2% influences still in the hand of other unidentified factors. Further study related to stigma towards HIV in young generations, especially HSUS, is needed to prove this proposition.

HSUS is the young generation of health care professionals in the future. Awareness of high HIV vulnerability among health care workers should make them more motivated to increase their knowledge about HIV/AIDS, avoid high-risk behaviours and adopt a healthy lifestyle. Increased HIV/AIDS-related knowledge potentially has implications for lowering stigma against HIV, increasing the willingness to participate in VCT, and providing high-quality health care services to the patients, especially for people who are living with HIV/AIDS.

This study has some limitations also. The nature of cross-sectional study with a single time point data collection has made the pattern, consistency, and intensity of variables' values over time was not assessed. Future study needs to incorporate a longitudinal cohort design to improve the present research methodology. In addition, in Indonesia there are two types of higher education institutions, one is a private university in which it is charity-funded, and the other is a public university which is government-funded. This study set was confined only to one of the charity-funded institution. Therefore, a generalization of the results should be cautioned. Dimensions of both questionnaires do not address local issues such as culture and habits. A modification and validation of scale study may be needed.

CONCLUSION

HIV/AIDS-related knowledge and the willingness to participate in VCT differed significantly among the four groups of HSUS in this study. Medical students had the highest knowledge level compared to other faculties. Most low knowledge levels was found in the faculty of nursing and psychology. As for the willingness to participate in VCT, most sufficient willingness was found in all faculties. HIV/AIDS-related knowledge is uncorrelated with the willingness to participate in VCT among HSUS, but it has a slight influence on it. Many other factors unidentified in this study possibly play a more important role in determining HSUS's willingness to participate in VCT.

The use of printed and electronic mass media should be more considered to be a means of sharing information on HIV/AIDS and VCT service utilization to HSUS along with seminar/ workshop events on this topic useful for increasing their HIV/AIDS-related knowledge. Faculty of nursing and psychology needs to encourage more HIV-related topics in their academic syllabus. Another study contains further analysis of other potential factors determining individuals' willingness to participate in VCT should be conducted to identify stronger predictors than knowledge itself, such as stigma against HIV/AIDS, and provide a greater chance for factors' modification, so that intervention could be developed to address this issue.

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Original Research

The Correlation Between Motivation and Health Locus of Control with Dietary Adherence of Diabetes

Kusnanto Kusnanto[1], Retno Dwi Susanti[1], Lailatun Ni'mah[1] and Hakim Zulkarnain[2]

[1] Fakultas Keperawatan Universitas Airlangga, Indonesia
[2] EMMEC, School of Health, University of Algarve, Portugal

ABSTRACT

Introduction: Controlling blood sugar can be done by dietary adherence of DM. To control glycemic, it is necessary to have motivation and health locus of control to face boredom in dietary adherence of DM. The aim was to analyse the correlation between motivation and health locus of control with dietary adherence of DM.

Methods: Cross-sectional design was conducted and involved 106 respondents from five public health centers in Surabaya selected by random sampling. Data were collected by questionnaire Treatment Self-Regulation Questionnaire (TSRQ), Multidimensional Health Locus of Control Scales" (MHLC), and Diet Adherence. The analysis data was using statistical Spearman rho ($\alpha \leq 0.05$).

Results: There was no correlation between motivation and dietary adherence (p=0.178), and there was a correlation between health locus of control with dietary adherence (p = 0.002).

Conclusion: According to analysis, it can be concluded that motivation is influenced by many things to the role the forming of patient behavior in dietary adherence of DM while health locus of control has an influence to dietary adherence of DM. Because of that, it is necessary to increase the factor that influences the behavior of DM control. One of it is health locus of control. So that the glycemic control with dietary adherence of DM can increase and be better.

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CONTACT

Kusnanto Kusnanto
✉ kusnanto@fkp.unair.ac.id
Fakultas Keperawatan Universitas Airlangga, Indonesia

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INTRODUCTION

Diabetes mellitus (DM) is a chronic metabolic disorder due to the pancreas being unable to produce enough insulin or the body cannot use insulin that is produced effectively (Kementrian Kesehatan RI, 2014). International Diabetes Federation (2017) reported that the number of DM patients in the world in 2017 reached 425 million adults with age ranged between 20-79 years. More than 79% of patients live in developing countries, and it is estimated that by 2045 the number of people with DM will increase to 629 million people. The International Diabetes Federation also reports that Indonesia is among the top 10 countries with the highest number of DM with 10.3 million people and is estimated to increase to 16.7 million in 2045 (International Diabetes Federation, 2017).

WHO predicts the increase in the number of people with diabetes in Indonesia from 8.4 million in 2000 to around 21.3 million in 2030. The report shows an increase in the number of people with diabetes by 2-3 times by 2035 (Perkeni, 2015). Basic health research in 2013 showed that the prevalence of DM in East Java was 2.1%, the prevalence experienced an increase in the prevalence of 1.1 when compared with the results of Riskesdas in 2007. The number of DM patients increased from 2007 to 2013 amounting to 330,512 patients (Kementrian Kesehatan RI, 2014). The prevalence of diabetics in East Java province ranks ninth with a prevalence of 6.8, while Surabaya prevalence is higher than in East Java, which is 7 (Kominfo, 2015). The 2016 Health Office annual report shows 32,381 DM patients went to the health center in Surabaya (Dinkes Jatim, 2016). Preliminary study conducted by researchers on 24 to 25 April 2018 there were 2,195 DM patients from January to March 2018 and spread in five health centers with the highest number of DM in Surabaya.

DM can be controlled well by diet, exercise, and antidiabetic drug therapy. Setting diet and physical activity is the main thing in DM management (Perkeni, 2015). Diet and weight control are the basis of diabetes mellitus management. If dietary adherence is carried out by DM patients, primary and secondary treatment can be performed optimally. The World Health Organization (2003) explained that the average patient's adherence to long-term therapy for chronic diseases in developed countries was only 50% while in developing countries the number was even lower. Patient adherence is needed to achieve therapeutic success, especially in diabetes mellitus. If a DM patient does not have self-awareness to be obedient, it can cause a failure in treatment which results in a decrease in health. Non-adherence in maintaining health affects the complications of DM and can lead to death (Saifunurmazah, 2013). International Diabetes Federation (2017) estimates that nearly 200 million people with diabetes are undiagnosed and more at risk of developing complications, which include kidney failure, blindness, amputation, heart disease, and stroke. Diabetic complications can be prevented by optimal glycemic control, however, in Indonesia, the target of achieving glycemic control is still not satisfactorily achieved, most of which is still above the desired target of 7% (Perkeni, 2015). The research conducted by Tera (2011) said that the determinants of diet disobedience of patients with type 2 diabetes from 13 respondents showed that there were no respondents who made a meal arrangement according to the amount of energy, type of food and recommended food schedule.

Controlling sugar levels by regulating diet in DM patients is not easy, boredom will certainly arise because the menu consumed is limited. Motivation can control patients in regulating blood glucose levels. Motivation is very important because it can make someone do something to achieve the desired goal (Indarwati et al., 2012). Research conducted by Indarwati et al. (2012) stated that there was a significant relationship between motivation on the DM diet and respondents who were highly motivated to have 7 times the opportunity to comply with the diet compared to respondents with low motivation. In addition to motivational factors, health locus of control (HLOC) also affects DM diet adherence. Health locus of control (HLOC) is a set of beliefs about a person who has an influence on health and is one of the factors that influence DM diet adherence (Bonichini, Axia and Bornstein, 2009). Health locus of control will affect the extent to which individuals will adhere to the diet being carried out (Indriyati, D. S. & Widyarini, 2012). HLOC is divided into two, namely internal and external HLOC. Individuals with internal HLOC will tend to work hard to take action to recover, always try to find problem solving, always think as effectively as possible and always have the perception that hard work must be done if they want to recover. Meanwhile individuals with external health locus of control will be more passive, less have initiative, less seek information to solve problems and less like to try because individuals believe that the outside factors control themselves (Adnyani, Widyanthari, and Kadek Saputra, 2015). Each individual has a different locus of control because individuals have different judgments and experiences that will affect their behavior.

The purpose of the study was to identify the relationship between motivation and health locus of control with dietary adherence in patients with DM.

MATERIALS AND METHODS

The research design used was descriptive correlation research with a cross-sectional approach. The data collection process was carried out on 3-14 July 2018 in five public health centers in Surabaya. The variables of this study were motivation, health locus of control, and adherence with DM diets. The population used in this study were 2,195 DM patients from January to March 2018 and spread in five health centers with the highest number of DM in Surabaya. Samples were obtained using proportional random sampling with inclusion criteria: 1) DM patients aged 35-55 years old; 2) Patients with DM who did not use insulin injection 3) Patients diagnosed with DM for more than one year. The number of samples in this study was 106 respondents.

Data collection techniques were carried out using a questionnaire Treatment Self-Regulation Questionnaire (TSRQ) by (Butler, 2002). TSRQ is used to measure patient motivation based on intrinsic motivation (autonomy) and extrinsic motivation (control). The questionnaire used was a modified questionnaire from Zycinska et al. (2012) which consisted of 11 items used to measure motivation in the DM diet. Modifications made were only using statement items related to DM diet motivation, and changing seven-point Likert scale into four Likert scales. The assessment uses a Likert scale: 1) strongly disagree, 2) disagree, 3) agree, 4) strongly agree. Total motivation score: 11-44. Grouped into 2, namely: good (≥80% total value or 35.2) and not good (<80% total value or <35.2).

The Multidimensional Health Locus of Control Scales (MHLC) by Walltson to measure health locus of control. This scale on this questionnaire is designed for health-related conditions and has 18 items with 3 independent subscales, namely Internal health locus of control, Powerful others health locus of control, Chance health locus of control. There are alternative answers, namely 6) strongly disagree, 5) quite agree, 4) slightly agree, 3) slightly disagree, 2) enough disagree, 1) strongly disagree. Grouped into 2, namely: Height: X ≥ Mean, Low: X <Mean

Dependent variable data were obtained from filling out the questionnaire about dietary compliance made by Haryono (2009) and modified by Permatasari (2014). The purpose of the questionnaire modification is to clarify the question

so that there is no mistake in understanding the questions in the questionnaire. The dietary compliance questionnaire contained: adherence to the meal schedule (4 items), adherence to choosing the type of food (8 items), compliance in the number of foods (1 item), adherence to maintaining weight (1 item) and adherence to medication (4 items). The diet compliance questionnaire consisted of 18 questions with alternative answers namely 4) always, 3) often, 2) rarely and 1) never. Questions consist of positive and negative questions. Positive number questions (1, 2, 8, 9, 10, 16, 17 and 18) negative number questions (3,4, 5, 6, 7, 12, 13, 14, and 15) with adherence scoring namely the range of scores 18-72 with the following categories: Poor (18-<36), Enough (36- <54), Good (54-72).

Data analysis using This study was analyzed in univariate and multivariate analysis tests using Spearman rho which is α = 0.05. This study has passed the ethical review of the Health Research Ethics Commission of the Faculty of Nursing Universitas Airlangga and received approval of the research protocol with number 963-KEPK.

RESULTS

The results of this study will be presented in table form. The results of this study will present data on the characteristics of respondents, motivation, health locus of control, dietary adherence of DM patients, the relationship of motivation with dietary adherence and health locus of control relationship with DM diet adherence.

Table 1 shows the characteristics of the research subjects, namely the respondents included in the highest age group were the elderly group (46-65 years) wherein this study there were 97 people (91.5%). This study dominated female respondents, namely some 88 (83%) respondents. The highest respondent status is with a married status of 79 (74.5%) respondents. The highest distribution of respondents seen from the length of diabetes mellitus is having a history of diabetes mellitus for 1-5.9 years, namely 81 (76.4%) respondents. The majority of respondents' education is basic education, namely 63 (59.4%) respondents. As well as judging from the consumption of drugs, the majority of respondents took the drug Glibenclamide and Metformin as many as 39 (36.8%) respondents.

Table 2 shows the motivational variables of 106 respondents, the percentage of motivations of the most respondents is poor extrinsic motivation as many as 99 (93.4%) respondents. Extrinsic motivation is good for 7 (6.6%) respondents. Intrinsic motivation is not good for 41 (38.7%) respondents and good intrinsic motivation 65 (61.3%). These data indicate that respondents from this study are more dominant, namely, motivation originating from themselves (intrinsic).

Table 1. Distribution of Demographic Characteristics of Respondents (n = 106)

Respondent Characteristics	f(x)	%
Age		
36-45 years	9	8.5
46-55 years	97	91.5
Gender		
Male	18	17
Female	88	83
Marital Status		
Married	79	74.5
Widower	27	25.5
Diabetes Suffering Period		
1 – 5.9 years	81	76.4
6 – 10 years	18	17
>10 years	7	6.6
Education		
Un formally educated	13	12.3
Elementary School	63	59.4
Junior to Senior High School	28	26.4
Higher Education	2	1.9
Medicine Consumed		
Do Not Use	5	4.7
Herbal Medicine	1	0.9
Glibenclamide	13	12.3
Glimepirin	6	5.7
Glukopak	1	0.9
Metformin	23	21.7
Glibenclamid & Metformin	39	36.8
Metformin & acarbose	1	0.9
Metformin & Glimepirin	17	16

Table 2. Frequency Distribution of Motivation, ealth locus of control, and diet adherence in people with diabetes mellitus

Variable	Sub Variable	Category	f	%
Motivation	**Intrinsic**	Less	41	38.7
		Good	65	61.3
		Total	106	100
	Extrinsic	Less	99	934
		Good	7	6.6
		Total	106	100
Health locus of control	**Internal**	Low	56	52.8
		High	50	47.2
		Total	106	100
	Powerful others	Low	45	42.5
		High	61	57.5
		Total	106	100
	Chance	Low	43	40.6
		High	63	59.4
		Total	106	100
Diet adherence in people with diabetes mellitus		Poor	7	6.6
		Fair	29	27.4
		Good	70	66
		Total	106	100

Table 3. Relationship of Motivation with DM Diet Adherence

Variable	Sub Variable	Category	Diet adherence in people with diabetes mellitus						Total	
			Poor		Fair		Good			
			f	%	f	%	f	%	Σ	%
Motivation	**Intrinsic**	Less	6	5.7	9	8.5	26	24.5	41	38.7
		Good	1	0.9	20	18.9	44	41.5	65	61.3
	Extrinsic	Less	7	6.6	28	26.4	64	60.4	99	93.4
		Good	0	0	1	0.9	6	5.7	7	6.6
Spearman p = 0.178										

Table 4. Relationship of Health Locus of Control with DM Diet Adherence

Variable	Sub Variable	Category	Diet adherence in people with diabetes mellitus						Total	
			Poor		Fair		Good			
			f	%	F	%	F	%	Σ	%
Health locus of control	**Internal**	Low	7	6.6	17	16	32	30.2	56	52.8
		High	0	0	12	11.3	38	35.8	50	47.2
	Powerfull	Low	6	5.7	14	13.2	25	23.6	45	42.5
		High	1	0.9	15	14.2	45	42.5	61	57.5
	Chance	Low	5	4.7	16	15.1	22	20.8	43	40.6
		High	2	1.9	13	12.3	48	45.3	63	59.4
Spearman p = 0.002										

Health locus of control shows that there are 56 (52.8%) having high internal health locus of control, namely patients who have control of their own health. 56 (52.8%) in the low category, namely the respondents who have confidence in their health control with outside influences are more dominant. In the powerful others health locus of control, there are 61 (57.5%) high patients who have confidence in health control all entrusted to others (health workers and family). In the powerful others health locus of control, there are 45 (42.5%) low, namely patients who have health control beliefs in addition to other factors that affect their health. There is 63 (59.4%) high health locus of control chance, that is, the patient believes more in fate, luck, luck, or opportunity that has a big influence on his health. 43 respondents (40.6%) were low, namely patients who had confidence in health control other than the factors of fate, luck or opportunities that affected their health. From the research data it can be explained that health locus control in patients with diabetes in Surabaya has control over their health, the most dominant of which is health locus control chance, namely the patient has the confidence that the patient's control is in the factors of fate, luck or opportunities that affect his health. Health locus of control is a continuum, sometimes a person can be "internal" and "external" at the same time (Azlin, 2007).

Diet adherence in people with diabetes mellitus shows the distribution of the most respondents was good diet adherence in diabetes mellitus, namely 70 (66%) respondents. 29 (27.4%) had adequate dietary adherence, and 7 (6.6%) had poor dietary adherence. From the research data it can be explained that the most dominant are respondents who have good dietary adherence because patients think they still have the opportunity to improve their health, but when patients are out of control of their trust in destiny and tempted to the surrounding environment, patients can break the diet which must be done.

Table 3 shows that respondents who have poor intrinsic motivation, the majority have good DM diet adherence, namely 26 (24.5%) respondents, but also there are 6 (5.7%) respondents who have poor diet adherence. While respondents who have good intrinsic motivation there are 44 (41.5%) respondents who have a good DM diet adherence and only 1 (0.9%) respondents with good intrinsic motivation who have poor diet adherence. Respondents who had extrinsic motivation were not good, the majority had good DM diet adherence, 64 (60.4%) respondents, and there were 7 (6.6%) respondents who had poor diet adherence. While respondents who had the good extrinsic motivation, there were 6 (5.7%) respondents who had a good diet adherence, and none of the respondents had a poor diet adherence that was equal to 0 (0%) respondents. The analysis results show that the proportion coefficient (p) is 0.178. Thus p = 0.178 is greater than the level of = (
the hypothesis (H1) is rejected, that there is no relationship between motivation and DM diet adherence.

Table 4 shows that respondents who had a low internal health locus of control, the majority had a good DM diet adherence, namely 32 (30.2%) but also there were 7 (6.6%) respondents who had poor diet adherence. Whereas respondents who had a high internal health locus of control, the majority were 38 (35.8%) respondents who had a good diet adherence, and there were no respondents with high internal health locus of control who had poor diet

adherence. Respondents who had low others health locus of control, the majority had good DM diet adherence, namely 25 (23.6%) but also there were 6 (5.7%) respondents who had poor diet adherence. Respondents who have powerful others Health locus of control are high, the majority of which are 45 (42.5%) respondents have good diet adherence, and respondents with high powerful others health locus of control who have poor diet adherence only 1 (0.9 %). Respondents who had a low chance of health locus of control, the majority had good adherence to the diabetes mellitus diet which was 22 (20.8%) and there were 5 (4.7%) respondents who had poor diet adherence. While respondents who had a high chance of health locus of control, the majority of them were 48 (45.3%) respondents who had a good diet adherence, and respondents with a high chance of health locus of control who had poor diet adherence were only 2 (1.9%) The analysis results show that the proportion coefficient (p) is 0.002. Thus p = 0.002 is smaller t

This means that the hypothesis (H1) is accepted, that there is a relationship between health locus of control and DM diet adherence.

DISCUSSION

The results of a study in the relationship between DM diet motivation and adherence obtained p> α, which means that H1 was rejected in other words there was no relationship between motivation and adherence to DM patients' diets. Basically, motivation is the interaction of a person with a particular situation he faces. Notoatmodjo (2010) states that motivation is an impulse from within a person that causes the person to carry out certain activities to achieve a goal. In a person, there is a need or desire for an object outside the person. Motivation has a very large role in the formation of DM patient behavior including adherence in carrying out a diet. Motivation is a predictor of adherence in regimens and glycemic control (Butler, 2002). Some research shows that someone who has high motivation will show positive results in DM management such as increasing participation in physical exercise programs and reporting symptoms of low depression (Wu, 2007).

Based on the results of the research obtained, researchers argue that the lack of meaningful motivation for adherence to DM diets, many factors influence motivation in adherence with DM diets. Respondents who have good motivation do not guarantee that the respondent has a good DM diet. The fact that in the community that most respondents said that their biggest motivation to recover and comply with the DM diet was their family, but respondents still violated DM diet rules because they felt bored and tempted by the food served.

The results of this study are in line with the research conducted by Pujiastuti, 2016 at the internal medicine polyclinic of Dr. RSUD Soehadi Prijonegoro Sragen also got results that there was no relationship between motivation and adherence to the DM diet program. According to the results of interviews with respondents, some respondents said that the respondent's family still provided food that should not be allowed or had to be reduced by DM sufferers, especially during the month of Ramadan. Respondents' families still provide sweet and high-calorie foods, such as compote and fried foods. This family has indeed reminded the respondents not to eat these foods, but the respondents continued to eat foods that DM patients should not eat. It affects the motivation of respondents in adherence with DM diets.

This research is different from the results of research conducted by Muflihatin, S. K & Komala (2016) and research conducted Risti and Isnaeni (2017) which states that there is a significant relationship between self-motivation and DM diet adherence. Behavioral attitudes in individual health are influenced by an individual's self-motivation to behave in a healthy manner. Without motivation in the diet setting, DM patients will experience non-adherence in regulating their daily diet. Respondents of good motivation have the opportunity to adhere to the DM diet for 329,667 times compared to respondents less motivation. Individuals will be motivated to take action if the action has a purpose, is planned. Motivation that exists within an individual is formed within a person and is influenced by two main factors, namely stimulus which is a factor that comes from outside a person (external factors) such as physical environmental factors such as social, cultural, habits, economic factors and responses from within self (internal factors) such as attention, observation, perception, motivation, fantasy, suggestion, depression and so on that respond to external stimuli. Thus, factors that are embedded in themselves can affect self-resilience in maintaining motivation to achieve a goal.

The results of study on the relationship of health locus of control and DM dietary adherence obtained p<α, which means that H1 was accepted in other words the relationship between health locus of control and dietary adherence of DM patients. The results of this analysis are supported by the results of research conducted by Safitri (2013) namely there is a significant relationship between health locus of control and adherence to DM diet management. Research conducted Adnyani et al., (2015) There is a significant relationship between health locus of control and adherence to DM diet management. The behavior of a DM diet is determined by several internal factors such as a strong desire to recover within oneself, as well as external factors such as family support factors or support from health workers or from the environment, culture and information and knowledge possessed by someone related to health is considered as a capital for someone to behave healthily.

The results of this study indicate that individuals who have the highest chance of locus of control have the highest health locus of control, others and internal. Health locus of control chance is the patient is more confident in fate, fate, luck, or opportunity that has a big influence on his health. So this makes the respondents not feel depressed about the recommended diet and make respondents better in following dietary recommendations.

The other high powerful health locus of control is the second most HLOC. This is evidenced by the fact that some respondents in the study said that they always depend on health workers but are reluctant to take actions aimed at improving their health. This tendency occurs because the culture of the Indonesian people are always dependent on each other and the experience and dependence of patients on health workers.

High internal health locus of control is the third most HLOC. This is evidenced by the fact that there are still research respondents who state that respondents are lazy and bored to follow the DM diet. This shows that the patient's control of himself is still lacking. This shows that respondents do not believe in themselves and there is no willingness of themselves to improve their health status. Respondents were not aware that internal control had a big role in improving their health status.

Health locus of control is a continuum, sometimes a person can be "internal" and "external" at the same time (Azlin, 2007). Health locus of control (HLOC) is something that is in someone personality that has an influence on health and is one of the factors that influence DM diet adherence. Health locus of control also plays an important role in determining public health behavior (Bonichini, Axia and Bornstein, 2009). The link between health locus of control and adherence is that individuals will not carry out health behaviors unless they have a strong desire to be healthy and at least have knowledge about health.

In this study, researchers have argued about the link between health locus of control and adherence. The results showed that health locus of control had more obedience. This is inversely proportional to the research conducted by Adnyani, I. A. P., Widyanthari, D. M. & Saputra (2011) that individuals with internal HLOC are more adherent to the DM diet than individuals with external HLOC. The average respondent said that there were no problems in eating arrangements and the patient did not feel tortured concerning the type and amount of food recommended, but at certain times the patient felt unable to follow dietary rules when there was a big event or family event. This shows that the patient's control of himself is still lacking and if this continues to be maintained, then the non-adherence of patients in undergoing a DM diet tends to decrease.

CONCLUSION

Motivation with DM diet adherence has no relationship with each other. This is evidenced by the presence of other factors that influence individual motivation in dietary adherence. Health locus of control with DM diet adherence has a relationship with each other. This is evidenced by DM patients who have good health locus of control who do not feel pressured towards the recommended diet and make respondents better in following dietary recommendations.

This study does not control the factors that influence perceptions of respondents' behavioral control, such as educational factors, age factors, cultural factors and environmental factors that can influence the filling of motivation questionnaires, health locus of control and DM dietary compliance. Need for further research regarding the factors that influence motivation, health locus of control and DM dietary compliance.

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Original Research

Improving Self-Protection Knowledge Against Sexual Abuse by using Dreall Healthy and Animation Video

Adelia Pradita, Arie Kusumaningrum and Jum Natosba

Nursing Science Study Program, Faculty of Medicine Sriwijaya University, South Sumatera, Indonesia

ABSTRACT

Introduction: The number of child sexual abuse cases in Indonesia are still high, including in Ogan Komering Ilir Regency, South Sumatera. One of the preventive effort that can be practiced is teaching them about children self-protection knowledge from sexual abuse through sexual education using appropriate methods and media, such as watching animated video and dreall healthy. The aim of this research was to determine difference in dreall healthy and animated video about sexual education toward children self-protection knowledge from sexual abuse.

Methods: This research was a quantitative study and use quasi experiment design with pretest-postest group. Samples in this research were 40 children in dreall healthy group and 37 children in the animated video group, the samples were taken using purposive sampling technique. The data were collected by using questionnaire and data analysis was using paired t test and independent t test.

Results: This research showed that there was difference in children self-protection knowledge from sexual abuse before and after sexual education with dreall healthy and animated video with p value 0.000 (α ≤0.05) and there was difference in children self-protection knowledge from sexual abuse between dreall healthy and animated video with p value 0.014 (α ≤0.05).

Conclusion: Sexual education with dreall healthy is more effective to increase children self-protection knowledge because it can stimulate the children's brain nerves so that their memory could be better. It was expected that parents, public health center staffs, and counselor in schools be able to provide sexual education as early as possible to the children.

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CONTACT

Jum Natosba
✉ jumnatosba_bayd@yahoo.co.id
Nursing Science Study Program, Faculty of Medicine Sriwijaya University, South Sumatera, Indonesia

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INTRODUCTION

Sexual violence is any act of coercion of sexual intercourse in a way that is unnatural and disliked by a child, coercion of sexual intercourse with another person for a specific commercial or purposeful purpose (Maharani et al., 2015). Based on data from the National Children's Alliance (NCA) there was an increasement in the number of sexual violence cases against children from 2014 to 2016. In 2014 the number of sexual violence cases against children reached to 205,438 cases. In 2015 the number of sexual violence cases against children increased to 206,768 cases and in 2016 the number of cases increased to 215,425 cases (National Children's Alliance, 2016).

In Indonesia, according to data from the National Commission for Child Protection, it shows that in 2015, cases of violence against children increased by 2,898 reports, 62% of which were sexual crimes and many unreported incidents (Research Center of DPR RI Expertise Agency, 2016). Based on the data of the Regional Child Protection Commission of Indonesia, Palembang, in the period of January to August 2016, had 20 cases of which were mostly cases of sexual violence against children, such as fornication and rape.

Based on the data from the South Sumatera Provincial Women's Empowerment and Child Protection Agency, Ogan Komering Ilir District is included in 10 districts with the highest number of cases of violence against women and children. Five

districts with the number of cases of violence against women and other children are Musi Banyuasin district, Empat Lawang, Banyuasin, Pali and Muara Enim. Based on data from the Office of Women Empowerment and Child Protection of Ogan Komering Ilir District, the number of cases of violence and sexual abuse in 2016, including child abuse, amounted to 24 cases.

The role of the country in overcoming violence against children, including child sexual abuse in Indonesia, is the establishment of the Indonesian Child Protection Commission, ratifying the Convention on the Rights of the Child, formulating laws on child protection, and forming a child-friendly city (Yarrini, 2014). In 2016, UNICEF collaborated with the World Health Organization (WHO) and other international partners to develop a technical package entitled 'INSPIRE: Seven strategies to end violence against children including sexual violence, which is implementation and enforcement of laws, Norms and values, Safe environments , Parent and caregiver support, Income and economic strengthening, Response and support services, education and lifeskills (UNICEF, 2017). Some efforts that have been made by the Indonesian Child Protection Commission (KPAI) to prevent violence and sexual harassment of children are by forming the SELARAS program (Save and Protect Children from Sexual Violence), establishing an integrated child protection system, and building a city that was worthy for children (Erlinda, 2016).

Based on data from Nugraha and Wibisono (2016), the high number of sexual violence cases was due to the lack of public knowledge about what can be taught to children to prevent acts of sexual violence and parents still feel taboo in providing sexual education to children, so that children have not gotten knowledge about sexual violence and how to protect themselves from sexual violence.

Prevention of sexual violence in children can be done by building a defend mechanism to provide knowledge and appreciation of their valuable body parts through the early sexual education (Erlinda, 2016). Sexual education can be provided to the children in the form of knowledge of self-protection skills of the occurrence of sexual abuse (Jatmikowati, Angin, & Ernawati, 2015). One study conducted by Jatmikowati et al (2015) shows that the subject matter of early childhood sex education includes themes: (1) Me and my body; (2) Me and my clothes; (3) Families and people around me; and (4) How to care for and keep the body.

Sex education can be done with an open attitude and in a relaxed atmosphere. In providing sexual education, methods and learning media need to be considered in order to achieve the goals of sexual education (Iskandar, Suhadi, & Maryati, 2014). The choice of learning methods and media, including providing sexual education, is adjusted to the age of the child. Learning methods and media that can be provided for early childhood are audio visual media such as animated videos and image media in the form of single images or images that are radiant or a set of images that are interconnected with one another (Zaman & Eliyawati, 2010).

Dreall Healthy is a form of puzzle game designed with a background that specifically contains content about health. Dreall healthy games can motivate and stimulate children's thinking patterns in applying health values contained in the game background (Rezky & Hardianto, 2012). In addition, puzzles are called educational games because in puzzle games there are educational elements which can train and improve children's memory, introduce children with various images, colors, and character's forms that are loved by children (Soraya & Rohmah, 2012).

Animated video is one of the learning media that can be provided for early childhood (Zaman & Eliyawati, 2010). Animated video is one of the methods and media that has been used in providing sexual education to children released by the Ministry of Women's Education and Child Protection and supported by UNICEF in 2014 through youtube. The video contains information about how to protect children from violence and sexual abuse. The effectiveness of animated video media in health education has been proven in a study that stated that animated videos effectively improve children's knowledge (Andriany, Novita, & Aqmaliya, 2016).

Animated videos and educational games are media and methods that can be used to provide learning and sexual education to children. However, in the implementation, both methods and media have not been maximally realized by the community where there was still lack of knowledge of the community about what can be taught to children in preventing acts of sexual violence so that people have less knowledge about what can be taught to children in preventing the occurrence of sexual violence acts (Rilianti & Ima, 2011; Notoatmodjo, 2012).

Based on the above background, researchers were interested to conduct a research focusing on the difference between the use of dreall healthy and animation videos about sexual education towards child's self-protection knowledge from sexual abuse. The purpose of this study was to determine differences in dreall healthy and animated video about sexual education toward children self-protection knowledge from sexual abuse.

MATERIALS AND METHODS

This research was a quantitative research with quasi experiment design with pre-test and post-test group. The sample of this study were 77 respondents obtained from the population of 1-2 grade children (age 6-7 years old) that collected on 30 March 2017, with total number of 1692 children in Kayuagung sub-district. The sampling technique used was purposive sampling with inclusion criteria, namely; those 1-2 graders of elementary school (age 6-7 years) who were physically and mentally healthy, willing to be research respondents, able to read,

have not received sexual education or information about child's self-protection yet, originally from Kayuagung, and interested in playing puzzles and watching animation videos according to their respective groups. This research was conducted at two elementary schools in Kayuagung. The sample was divided into 2 groups; dreall healthy intervention group and animation video intervention group.

The data collection tools used were questionnaire and observation sheet. Questionnaire was consisted of open-ended questions. The questionnaire used was adapted from the research of Jatmikowati et al., (2015), which was modified by researchers. The questionnaire contains material about (1) Me and my body; (2) Me and my clothes; (3) Families and people around me; and (4) How to care for and keep the body. The questionnaire consisted of 25 questions that have been proven valid and reliable. The validity test was carried out by researchers in April 2017. Validity test was using the Pearson Product Moment test. Validity test results showed that there were 25 valid questions with r arithmetic > r table (0.5760), and reliability test results showed that 25 questions were reliable with Cronbach's alpha value 0.755 (> 0.6).

The study was conducted in the classroom according to the intervention group in 1 day which was consisted of 2 sessions. Session 1 for dreall healthy interventions. Before intervention, researchers and assistants distributed pre-test sheets. Researchers and assistants interviewed participants using a 20-minutes pre-test sheet. Then intervening dreall healthy games for 28 minutes and ended with an interview process using a post-test sheets. Session 1 was carried out for 80 minutes. Next, session 2 is an animation video intervention. Before intervention, researchers and assistants distributed pre-test sheets. Researchers and assistants interviewed participants using a 20 minutes pre-test sheet. Then the next intervention, watching the animated video, was held for 13 minutes and ended with the interview process using the post-test sheets. Session 2 was conducted for 60 minutes.

The data collection procedure started from performing administrative procedures in the form of research implementation permission and distribution of informed consent sheet to the respondents' parents. Furthermore, researchers and research assistants undertook preparation phase, which was environmental preparation such as lighting and noise, places and respondents. Data collection was conducted before and after the intervention was conducted, and the observation of the research was conducted during the intervention process. Data analysis used was univariate and bivariate analysis. Univariate analysis describes the characteristics of respondents, and bivariate analysis used paired t test and independent t test using SPSS 16 software. This research has been in accordance with the research standards and has meets ethical criteria consisting of informed consent, anonymity, confidentiality, beneficiary and justice.

RESULTS

The characteristics of Respondents based on their sex, in the dreall healthy group there were 40 respondents, consisted of 52.5% female and 47.5% male, in the animated video group there were 37 respondents, consisted of 45.95% female and 54 , 05% of male. From both groups, there were 50,65% male respondents and 49,35% female respondents.. All respondents were 7 years old. All respondents came from Kayuagung, Ogan Komering Ilir. All of the respondents have not had any information and any experience of sexual education about child's self-protection knowledge against sexual violence.

Before the analysis was conducted, the researcher first performed the data distribution test by using normality test. The normality test in this study used the shapiro-wilk test, because the number of samples for each group was less than 50 samples (Dahlan, 2014). Normality test results showed the obtained p value in dreall healthy group during pre-test was 0.159, and at post-test was 0.066. In the animation video group, the p value of the pre-test value was 0.131, and the post-test was 0.107. Thus, dreall healthy group data and animation video during pre-test and post-test were normally distributed (p value ≥0.05).

The average score of children's self-protection knowledge against sexual abuse before given sexual education through dreall healthy was 18.32 (SD ± 1.607), and the mean score after given sexual education was 22.60 (SD ± 1.499) which means that there was a significant improvement in respondents' knowledge of self-protection after being given sexual education through dreall healthy (table 1).

Based on the statistical analysis, it was found that there was a significant difference in score of children's self-protection knowledge against sexual abuse before and after sexual education through dreall healthy with p value 0.000 (α ≤0.05). Based on the observation data, the respondents who played while learning, in this case played the puzzle, were more interested and more excited in preparing the puzzle pieces. In addition, respondents were very enthusiastic and curious about the results of the arrangement of the puzzle; therefore, respondents were more focused in viewing and reading the contents of the puzzle (table 1).

The average score of child's self-protection knowledge against sexual abuse was 18.76 (SD ± 1.754), and the mean score after given sexual education was 22.27 (SD ± 1.610) which also means that there was a significant improvement in respondents' knowledge after being given sexual education through video animation (table 1).

Table 1. Differences in Score of Child's Self-Protection Knowledge against Sexual Abuse Before and After Given Sexual Education through Dreall Healthy

Groups		n	Mean	SD	Min-Max	95% CI		t	df	P value
						lower	Upper			
Dreall Healthy	Pre-test	40	18.32	1.607	15.22	17.18	18.84	-20.480	39	0.000
	Post-test		22.60	1.499	19.25	22.12	23.08			
Animation video	Pre-test	37	18.76	1.754	15.22	19.17	19.34	-16.125	36	0.000
	Post-test		22.27	1.610	1925	21.73	22.81			

Table 2. Differences in Average Score of Child's Self-Protection Knowledge against Sexual Abuse between Dreall Healthy and Animation Groups.

Variable	Intervention	n	Mean	SD	P value
Knowledge	Dreall Healthy	40	4.28	1.320	0.014
	Animation Videos	37	3.51	1.325	

Based on the statistical analysis, it is also known that there was a significant difference in score of children's self-protection knowledge against sexual abuse before and after sex education through animated video with p value 0.000 (α ≤0.05). Based on observation data, children became very interested in watching animated videos, especially in the form of cartoons. Video with colorful display, with cartoon pictures that the respondents liked, and accompanied by sound, made respondents became more interested in watching the animation video. Therefore, the process of delivering information was more easily accepted by respondents (table 1).

Based on the table 2, it can be seen that the difference of the average score of child's self-protection knowledge against sexual abuse with dreall healthy intervention was 4.28 (SD ± 1.320). Meanwhile, the difference of the average score of child's self-protection against sexual abuse with the animation video intervention was 3.51 (SD ± 1.325). From the result of the statistical analysis, it can be concluded that there was a significant difference on child's self-protection knowledge against sexual abuse between those who were taught se education through the dreall healthy and through animation video with p value 0.014 (α ≤0.05). The difference of dreall healthy group average score was greater than that of animation videos groups. Therefore, it can be concluded that dreall healthy is more effective in increasing the child's knowledge about self-protection against sexual abuse.

DISCUSSION

The media play an important role in practice, policy, and public perception of child sexual abuse, in part by the way in which news stories are framed (Weatherreda, 2015). Based on research conducted by Walsh, Zwi, Woolfenden, and Shlonsky, (2015), it shows that school-based sexual harassment prevention programs using video media and game methods are effective in increasing participants' skills in protective behavior and knowledge about the concept of preventing sexual harassment.

The result of statistical test with paired t-test shows that there was a significant improvement in respondents' knowledge after being given sexual education through dreall healthy. This is in accordance with the results of research conducted by Hariyanto dan Sumini (2016) which revealed that nutrition education by using the media of balanced nutrition 'tumpeng' puzzle in kindergarten managed to improve the child's knowledge about balanced nutrition.

Dreall Healthy is a form of puzzle game, but with different pieces of puzzle pieces, that is hexagonal shape (Rezky & Hardianto, 2012). Puzzle game is a form of educational game for elementary school age children called the skill game. Proficiency games are all forms of games and activities that require proficiency in controlled hands and eyes use (Dorothy, 1985, quoted by Simon, Hartati, and Arsilah, (2007). Based on the data from Trisyana and Reza (2013), by playing puzzles the child's thinking and cognitive abilities will increase because when playing puzzle children will train their brain cells to develop their thinking skills and concentrate on completing pieces of the puzzle.

There was a significant difference in score of children's self-protection knowledge against sexual abuse before and after sexual education through dreall healthy. This result is supported by research conducted by Nurvita (2014) which explains that the puzzle game can develop the cognitive aspects of children in which children will be more interested to learn and to understand the contents of the puzzle. Based on observations, respondents who were playing while learning, in this case, playing puzzles will be more interested and more enthusiastic in compiling the puzzle pieces. In addition, respondents were very enthusiastic and curious about the results of the puzzle arrangement so that the respondents were more focused on seeing and reading the contents of the puzzle.

The result of statistical test with paired t-test shows that there was a significant improvement in respondents' knowledge after being given sexual education through video animation because in the delivery of messages through video animation make use of the visual and

audio aspects so as to make it easier in storing information (Noviyanto, Juanengsih, & Rosyidatun, 2015). The colorful display of videos, using animated images and accompanied by sound make respondents more interested to watch the animated video shows so that the process of delivering information will be more easily accepted by respondents. This result is in accordance with a research conducted by Andriany et al., (2016) with the results of research showing the increased knowledge about dental and oral health on respondents after given counseling through animation media.

It is also known that there was a significant difference in score of children's self-protection knowledge against sexual abuse before and after sex education through animated video. This is in accordance with the statement of Andriany et al., (2016) that the improvement of oral and dental health knowledge due to animated cartoon animation media is able to stimulate children's curiosity and their interest in what they learn, thus, the purpose of the counseling media can achieve optimal results.

From the result of the statistical analysis, it can be concluded that there was a significant difference on child's self-protection knowledge against sexual abuse between those who were taught education through the dreall healthy and through animation video. The difference of dreall healthy group average score was greater than that of animation videos groups. Therefore, it can be concluded that dreall healthy is more effective in increasing the child's knowledge about self-protection against sexual abuse.

Dreall healthy games gives an effect in improving child's self-protection knowledge against sexual abuse because puzzle games are more interesting and more fun, so children are more likely to receive the information given (Hikmawati, Yasnani, & Sya'ban, 2016). This is supported by research conducted by Riadi dan Supriyono (2014). Their results showed that puzzle media have successfully increased the students' learning outcomes in each cycle and have made the students' achieve their success indicators.

Video is one of the tools in giving or delivering messages (Notoatmodjo, 2012). The use of animated video media in delivering health education messages makes it easier to store information on cognitive structures because of the presentation of information that utilizes visual and audio aspects. In accordance with the theory that was put forward by Piaget about cognitive learning theory, information is more meaningful in student memory and stored in long term memory in the right brain, therefore presentation of information needs to utilize visual and audio aspects (Noviyanto et al., 2015).

The results of research conducted by Lubis (2016) showed that the audio visual method is more effective in improving knowledge of child dental caries care in the area of Wonosegoro II Community Health Center. Based on the data from Miftahusaadah, (2016), video were influential and useful in increasing knowledge about the selection of snack foods for students at SD 01 Gayamdompo, Karanganyar District, Karanganyar Regency. This statement is supported by the results of the Sinor (2011) which states that animated cartoons are more effective in conveying messages of oral health education compared to conventional methods in students at the Upper Terengganu School.

However, at the time of the animation video intervention in observation data, not all children could focus on the animation video because many things could make children distracted while watching the video. Therefore, not all children were able to receive information from the video. This is supported by the theory from Kustandi dan Sutjipto (2013) which explained that, when the video was continuously played, not all children can follow the information conveyed through the video. Both methods are equally attractive to children in receiving learning. According to the theory proposed Khadijah (2016), one of the methods in developing children's cognitive side is the method of play, because learning that does not use game on it, has not yet been able to improve cognitive ability (Olii, 2013).

CONCLUSION

Dreall healthy and animated video can enhance the knowledge of children's self-protection from sexual abuse where dreall healthy is more effective than animated video. Sexual education with dreall healthy is more effective to increase children self-protection knowledge because it can stimulate the children's brain nerves so that their memory could be better. It was expected that parents, public health center staffs, and counselor in schools be able to provide sexual education as early as possible to the children. For further researchers, it is expected that further research can create more interesting media for children and can involve parents directly in providing sexual education to children so that parents can more easily convey sexual education information and not be taboo on sexual education to children.

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Original Research

Complaints in Menopausal Women and Its Correlation with Lifestyle and Stress

Ni Ketut Alit Armini, Lailatun Ni'mah and Baiq Selly Silviani

Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Introduction: Every woman will have menopausal experiences at the end of a biological process called menstrual cycles. Several complaints can be aggravated by lifestyle and stress. This study was to analyze the relation of lifestyle and stress levels with a menopausal complaint in women.

Methods: This study was correlational with a cross-sectional approach. The study involved 101 menopausal women lived in a community selected by proportional random sampling. The independent variables were lifestyle and stress levels in menopausal women. The dependent variable was a menopausal complaint. This study used primary data provided by questionnaires and interviews. The data were analyzed using Spearman's Rho.

Results: There was strong correlation between lifestyle (p=0.000; r=-0.424), stress levels (p=0.000; r=0.535), and complaint in a menopausal woman.

Conclusion: A healthy lifestyle, stress-controlled to minimize complaints in menopausal women. Further research is needed on factors that increase stress in postmenopausal women.

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CONTACT

Ni Ketut Alit Armini
✉ nk.alita@fkp.unair.ac.id
Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

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INTRODUCTION

Life expectancy increased from 70.7 years in 2008 to 73.7 years in 2025 (Kemenkes RI, 2016). Women aged 45-55 years are generally going through menopause, which starts when the ovaries begin to reduce the production of estrogen and progesterone (Curran, 2009). Menopausal women will have climacteric complaints such as irritability, fear, anxiety, hot flushes, depression, headache, fatigue, difficulty in concentrating, forgetfulness, lack of energy, weight gain, pain in bones and muscles, obstipation, heart palpitations, impaired libido, tingling, and dizzy eyes (O'Neill & Eden, 2012). Menopausal women can experience menopause syndrome complaint for 7 years during the menopause transition and 4.5 years during the final menstrual period (Avis et al., 2015).

Lifestyle and modern diet which is today followed the turns are potentially vulnerable to damage the health and cause disease (Stojanovska, Apostolopoulos, Polman, & Borkoles, 2014). Women entering menopause will be depressed by loss of their role as a woman and having to face old age. Feelings of depression can be caused by physical, emotional, social, economic, or employment factors or circumstances, events, or experiences that are difficult to manage or survive. The prevalence of depression is higher in women than men throughout their reproductive years along with the menopausal transition (Freeman, Sammel, & Sanders, 2014). Stress affects the functional disorders of organ disorders, and psychological such as anxiety and or depression (Curran, 2009; Hawari, 2016).

Indonesian women experience five major symptoms during the climacteric, which are muscle and joint pain (77.7%), fatigue and missing energy (68.7%), loss of sexual desire (61.3%), wrinkles (60%), difficulty concentrating, and hot flushes (29.5%) (Muharam, 2007). Freeman, Sammel, and Sanders (2014) expressed that as many as 80% of women experience symptoms of hot flashes other and heart palpitations in the moderate to severe category during the menopausal transition. Menopause occurs due to a decrease in estrogen produced by the ovaries. Women are said to have undergone menopause when menstrual periods have stopped for 12 months (Baziad, 2007). Irregular ovarian function and fluctuating levels of estrogen during menopause cause women often to

experience symptoms called climacteric syndrome. Menopausal symptoms include vasomotor symptoms with symptoms that appear in the form of a feeling of heat with sweating a lot at night (Curran, 2009; Mulyani, 2013). The decline in estrogen also causes a decrease in neurotransmitters in the brain that affect mood so that anxious feelings appear that trigger depression or stress (Proverawati & Sulistyawati, 2010).

How that can be done in reducing menopausal complaints such as creating a healthy lifestyle (Moon, Hunter, Moss-Morris, & Hughes, 2017). It is important for menopausal women to follow a healthy lifestyle in order to have an impact on the psychological effects (Dorjgochoo, 2008). Mansikkamaki et al. (2015) stated that women who carry out physical activities have a better perception of their own health, and better health and global Quality of Life (QoL) compared to women who do not engage in physical activity. One of the ways to reduce menopausal complaints is to create a healthy lifestyle (Priyoto, 2014). The importance of living a healthy lifestyle is that it can also have an impact on the psychology of menopausal women (Rahmayani, Wijaksono, & Putri, 2016). The aim of this study was to describe the relationship between lifestyle, stress levels, and complaints in menopausal women.

MATERIALS AND METHODS

The research was a correlational study with a cross-sectional design. The population in this study were menopausal women aged 48-60 years in a community health center in Surabaya. The sampling technique used proportional random sampling. Samples were obtained by calculating the proportion of menopausal women in four community health services (posyandu) for elderly in Surabaya. The sample size was 101 women who experienced menopause and live with their husbands. The independent variable in this study is lifestyle and stress levels. The dependent variable in this study is a menopause complaint.

The data were collected using questionnaires in which the researchers interviewedthe respondents through the list of questions. The instrument used to measure menopausal complaints originates from the Menopause Rating Scale (MRS) developed by The Berlin Center for Epidemiology and Health Research so that the questions have been validated in content. The measuring instrument used in this study has been standardized based on the literature so that it does not need to be tested for validity and reliability (Heinemann et al., 2014; Heinemann, Potthoff, & Schneider, 2003). The MRS questionnaire consists of 5 choices: 0: none; 1: mild; 2: moderate; 3: severe; and 4: verheavy. The scale of this instrument can measure three groups of complaints. Psychological complaints are in the form of heart palpitations, feelings of tension or pressure, difficulty sleeping, easy contact, easy panic, difficulty concentrating, and being easily tired. The categories for psychological complaints are 0-1: none; 2-3: mild; 4-6: moderate; ≥7: severe. Somatic complaints are in the form of feeling dizzy, the body feeling depressed, part of the body feeling pierced by thorns, headaches, and muscle or joint aches. The categories for somatic complaints are 0-2: none; 3-4: mild, 5-8: moderate; ≥9: severe. Vasomotor complaints are in the form of hot flushes and night sweats. The categories for vasomotor complaints are 0: none; 1: mild; 2-3: moderate; 4: severe.

Stress level data used a modified questionnaire from DASS 42 (Lovibond & Lovibond, 1995) by choosing specific points to assess stress levels, consisting of 4 choices where 0: none; 1: sometimes; 2: often; and 3: always with 0-14 rating categories: normal; 15-18: light; 19-25: moderate; 26-33: severe; ≥34: very severe. Lifestyle data consists of 4 component statements, namely diet, activity/exercise, sleep rest and smoking. There is a positive statement by way of valuation in the form of 4 = always; 3 = often; 2 = sometimes; 1 = never, and on negative statements the method of evaluation is 1 = always; 2 = often; 3 = sometimes; 4 = never, with 21-50 category = unhealthy; 51-80 = healthy.

Considering the data collection practices of research ethics, the study was approved by the Ethics Committee of Health Research, Nursing Faculty, Universitas Airlangga, with certificate number 590-KEPK on December 4th 2017.

RESULTS

Most respondents were aged 55-60 years, and there were as many as 61 respondents (60.4%). Most of the respondents are housewives, as many as 85 respondents (84.2%). The most of respondents had experienced menopause for 1-5 years as many as 47 respondents (Table 1)

The majority of respondents had menopausal complaints in moderate category as many as 53 respondents (52.5%). Most respondents live a healthy lifestyle, as many as 69 respondents (68.3%), while the level of stress experienced by respondents was mostly in the normal category, as many as 64 respondents (63.4%) (Table 2).

Most respondents with a healthy lifestyle experienced menopausal complaints within the moderate category, that was 39 respondents (38.6%), and at least category of such respondents were in normal category as many as five respondents. Most respondents who lived an unhealthy lifestyle experienced menopausal complaints within the severe category, as many as 17 respondents (16.8%), and no respondents had complaints of menopause in the mild category (Table 3).

Statistical test results using Spearman obtained significance level of $p = 0.000$ by assigning degrees of significance $\alpha \leq 0.05$, which means that there is a relationship between lifestyle with complaints of menopausal women. The correlation coefficient was obtained -0.424, which means that the more healthy

Table 1. Characteristics of Respondents (n=101)

Characteristics	n	%
Age		
48-54 years	40	39.6
55-60 years	61	60.4
Employment		
Housewife	85	84.2
Private	8	7.9
Self-employed	8	7.9
Menopause experience		
1-5 years	47	46.5
6-10 years	37	36.6
11-15 years	13	12.9
16-20 years	3	3.0
21-25 years	1	1.0

Table 2. Lifestyle, Stress Levels, and Complaints in Menopausal Women (n=101)

Variables	n	%
Lifestyle		
Healthy	69	68.3
Unhealthy	32	31.7
Stress level		
Normal	64	63.4
Mild	14	13.9
Moderate	19	18.8
Severe	4	4.0
Menopause complaints		
None	6	5.9
Mild	17	16.8
Moderate	53	52.5
Severe	25	24.8

lifestyle will lead to less menopausal complaints (Table 3).

A respondent who was at normal stress level was more likely to experience menopausal complaints in the moderate category, as many as 36 respondents (35.6%), and six respondents (5.9%) in the category had severe complaints. Most respondents who are at mild stress level had complaints of menopause in the middle category, as many as nine respondents (9%). Most respondents who were at moderate stress level experienced the severe category of complaints as many as 14 respondents (14%), and respondents who were at severe stress level have complaints of menopause in severe categories, as many as three respondents (3%) (Table 4).

Statistical test results using Spearman obtained significance level of p=0.000 with a degree of significance $\alpha \leq 0.05$, which means there is a relationship between stress levels with symptoms in menopausal women. The correlation coefficient was obtained 0.535, which means that the lower stress level will lead to less menopausal complaints (Table 4).

DISCUSSION

Lifestyle-related complaints in postmenopausal women at as indicated by the statistical result that the value of p=0.000, which means getting healthier lifestyle menopausal women perceived grievance is reduced. In accordance with the study by Moon, Hunter, Moss-Morris, and Hughes (2017), the symptoms of menopause are influenced by several factors such as lifestyle, social, and psychosocial. Terauchi et al. (2010) found that sleep problems such as insomnia and difficulty sleeping well experienced by menopausal women with regard to the characteristic of lifestyle.

The results of the study obtained 17 respondents who lead unhealthy lifestyles with severe menopausal complaints. The age of the 17 respondents were mostly in the range of 55-60 years, which is the age to the elderly stage where sleep problems began to be felt. When 17 respondents said sleep less than 8 hours, sleeplessness, like wake up at night and when awakened body feels sore. Most menopause 6-10 years old where according to Avis et al. (2015) stated menopausal women will experience menopausal complaints for 4.5 years after the cessation of menstruation and 7 years old during the long transition to menopause that the complaint is still perceived by the respondents. A total of 15 respondents out of 17 respondents were housewives. Women who worked as housewives did less frequent sports activities independently at home as the majority of respondents stated that housework is also a form of exercise for them.

Some lifestyle patterns that can be seen are diet, exercise, rest and sleep, smoking, and drinking alcohol. Research results obtained showed that respondents who have healthy lifestyles are mostly situated on the pattern of restful sleep respondents who do not take sleeping pills, it is associated with the majority of respondents who experience sleep problems that are in the category of mild to moderate during menopause where sleep problems in future associated with vasomotor menopausal complaints such as hot flushes and night sweating. The results obtained from interviews showed most respondents as housewives spend more time taking care of the house and some are involved in caring for grandchildren. Most respondents said they took a nap for about 1-2 hours and at night began to sleep at 21:00 and woke up at 04.00 am, although sometimes they wake up at midnight to urinate.

Menopausal complaints can be aggravated by smoking and drinking alcoholic beverages due to the levels of estrogen and progesterone in menopausal women diminishing. Cochran, Gallicchio, Miller, Zacur, & Flaws (2008) suggested that women with larger smoking status had complaints of menopause such as hot flushes and there are sleep problems in women smokers where estrogen and progesterone hormone levels are lower. Oi & Ohi (2012) found that smoking affects the occurrence of menopausal symptoms such as sweating in the night, hot flushes, insomnia, and other physical symptoms of menopause. Smoking is actually lung exposure to combustion products of tobacco, which are toxic. The burning cigarette toxins will be carried by the blood and will cause it to malfunction for reproduction (Hardy, 2000). The attack of hot flushes may be

Table 3. Lifestyle to Menopausal Complaints (n=101)

Lifestyle	Menopausal Complaints				
	None n (%)	Mild n (%)	Moderate n (%)	Severe n (%)	Total n (%)
Healthy	5 (4.9)	17 (16.8)	39 (38.6)	8 (7.0)	69 (68.3)
Unhealthy	1 (1.0)	0 (0.0)	14 (14.0)	17 (16.8)	32 (31.7)
Total	6 (5.9)	17 (16.8)	53 (52.5)	25 (24.0)	101 (100)
Spearman's Rho test: p=0.000; r=-0.424					

Table 4. Level of Stress to Menopausal Complaints (n=101)

Level of Stress	Menopausal Complaints				
	None n (%)	Mild n (%)	Moderate n (%)	Severe n (%)	Total n (%)
Normal	6 (5.9)	16 (15.8)	36 (35.6)	6 (5.9)	64 (63.3)
Mild	0 (0.0)	1 (1.0)	9 (9.0)	2 (1.9)	12 (11.9)
Moderate	0 (0.0)	2 (1.9)	5 (4.9)	14 (14.0)	21 (20.8)
Severe	0 (0.0)	0 (0.0)	1 (1.0)	3 (3.0)	4 (4.0)
Total	6 (5.9)	19 (18.8)	51 (50.5)	25 (24.7)	101 (100)
Spearman's Rho test: p=0.000; r=0.535					

increased due to toxic effects contained in the alcohol because alcohol can relax the muscles of blood vessels causing them to dilate and increase blood flow and the risk of a flush (Mulyani, 2013).

The results of this research found that most respondents who do not smoke and consume alcoholic beverages complain of hot flushes that are in the lightweight category did not even complain of hot flushes. Complaints to do with sleep problems in this study are located mainly in the lightweight category. It also deals with the majority of respondents are Moslem, but the majority of respondents said that smoking is the husband and/or children, where the chances of exposure to cigarette smoke and this may also affect the health of postmenopausal women. It is highly recommended that women who smoke should stop during menopause to reduce the occurrence of an increased likelihood of experiencing complaints such as hot flushes and insomnia. Menopausal women who do not smoke but are in the neighborhood of those who do are advised to avoid smoke.

Physical activity is usually done by most respondents in the form of gymnastics, which are held once a week in posyandu, and doing daily homework independently. Some respondents did not follow gymnastics for reasons to sell. Less healthy lifestyles do most respondents is the lack of exercise habits, associated with discomfort in the joints and sexual problems.

Physical activity has benefits that can reduce a variety of complaints during menopause occurring as well as improving blood circulation, counteracting depression, making you sleep better, and increasing bone density in postmenopausal women. Regular exercise of at least 30 minutes a day can increase life expectancy and improve overall health (Mulyani, 2013; Stojanovska et al., 2014). Sternfeld et al. (2014) explained that physical activity in postmenopausal women did not significantly decrease vasomotor symptoms but can improve overall health and well-being feeling, and sleep quality, and reduce symptoms of insomnia and depression.

Diet is associated with a person's lifestyle. A balanced diet is foods that contain nutrients in the type and amount the body needs. Most respondents have a balanced diet, such as eating foods containing carbohydrates, fat, protein, and vitamins, and eat regularly three times a day a portion that is not excessive. In the results of the interviews, most of the respondents said that the diet commonly consumed is rice, tofu, tempeh, vegetables, eggs, and chicken. Usually, respondents consumed fruit two to three times a week and rarely drink milk. The decline in estrogen and progesterone hormone levels affects the bad mood. It is important to consume foods that provide essential nutrients for healthy brain function. Protein-containing foods may reduce the occurrence of complaints such as hot flushes and improve memory in menopausal women. Estrogen is involved in memory function, while in menopause, the hormone estrogen is decreased, so women who consume protein will help in boosting the release of neurotransmitters that serve to convey the information in the brain and other body parts (Mulyani, 2013). Consuming fruits and vegetables is good for maintaining a healthy body because they contain vitamins, minerals, beta-carotene, and antioxidants that are important for the body (Bauld & Brown, 2009; Gayatri, 2011). Foods containing vitamin E may help reduce the complaints of hot flushes and vaginal dryness problems (Muharam, 2007; Mulyani, 2013). Most of the respondents already have the habit of eating vegetables, but rarely eat fruits. In research by (Anggrahini & Handayani, 2014), menopausal women who consumed milk (soymilk) showed a decrease in menopausal complaints because the milk helps in

supplying the hormone estrogen, the lack of which is caused by decreased ovarian function.

Stress is an adaptive response through individual characteristics or psychological processes directly to the action, situation, and external events that give rise to the special demands of both physical and psychological issues question (Hawari, 2016). Stress is not only about dysfunction or abnormalities of organs, but it also has a psychological impact, for example anxiety and/or depression (Yusuf, Armini, & Hardiyan, 2008). Severe levels of stress can affect the cardiovascular system, causing symptoms such as heart palpitations, and blood vessel dilation or constriction; other than that the body feels hot flushes that aggravate the symptoms of hot flushes (Bauld & Brown, 2009). Somatic symptoms are often seen as a symptom of follow up or a result of stress, anxiety, and depression is prolonged. Someone in the field of sexual excitement can also be affected by stress (Thurston & Joffe, 2011).

People who are stressed often complain of muscle sensations like tingling, aching, and strain. Bone joint complaints are often experienced by, for example, feeling pain or stiffness when moving the limbs. Decreased libido is also often experienced by someone with high stress (Hawari, 2016). The results showed postmenopausal women with stress level category of moderate to severe respiratory symptoms sexual problems weight category. Respondents who had complaints of discomfort in the joints and muscles are located mainly in the category of mild to severe with normal stress levels; the more severe a person's stress level, grievance felt increasingly severe menopause. The majority of respondents said that the way to overcome the stress experienced was by worshiping, praying, and recreation with family. Almost all respondents are housewives, where the frequency of socializing with neighbors and family is more flexible to follow the teaching activities and exercises organized by the posyandu. Bauld & Brown (2009) and Moon et al. (2017) reported that negative events or emotions can worsen the symptoms of menopause, which demonstrates the importance of the effect of psychosocial factors on menopausal symptoms.

There are three respondents who have high-stress levels with severe menopausal complaints, seen from three respondents who have experienced menopause for 5-10 years. This is because the old woman with 7 years of experience of menopausal symptoms during the menopausal transition and 4.5 years after the cessation of menstruation, so the complaint can still be perceived by the respondents with a range of menopause 5-10 years old and is augmented with severe stress levels. All three respondents are housewives whose activities are mostly done at home, are likely to experience higher stress associated with marital problems, and rarely do sports with the family. There was one respondent to the level of stress but had complaints of menopause medium category. Of respondents 60 years of age, at the age of postmenopausal women age limit towards medium.

CONCLUSION

Menopausal women with healthy lifestyleare more likely to have less menopausal complaints. Menopausal women with lower stress levels experience reduction in menopausal complaints. Respondents manage the stressors by peer socialization, recreation with family, and following health education. Women in pre-menopause period should have motivation to maintain a healthy lifestyle, which involves a balanced diet, physical activity, restful sleep, avoiding smoking and drinking alcoholic beverages, and being able to manage stress in a positive direction to reduce menopausal complaints. Further research can be developed for intervention models to improve healthy lifestyles and stress management in menopausal women.

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Original Research

The Association of Pornographic Media Exposure and Nutritional Status with Early Menarche

Deswita Deswita, Randy Refnandes and Mella Gustriyani Putri

Faculty of Nursing, Universitas Andalas, Sumatera Barat, Indonesia

ABSTRACT

Introduction: The adolescent menarche period has shifted to a younger age because of several factors, including a girl's nutritional status and exposure to pornographic media. The purpose of this study is to determine the relationship between pornographic media exposure and nutritional status with the age of menarche in girls in elementary school.

Methods: This research used a descriptive cross-sectional design. 121 respondents were selected by proportional random sampling. Nutritional status data was collected by measuring body mass index, while the usage of media exposure and the age of menarche were both identified using questionnaires. All data was analysed using the chi-square test.

Results: There was a significant relationship between the age of menarche with the exposure to mass media (p=0.000) and nutritional status (p=0.000).

Conclusion: The age of menarche in adolescent girls is associated with nutritional status and media exposure.

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CONTACT

Deswita Deswita
✉ deswita@nrs.unand.ac.id
Faculty of Nursing, Universitas Andalas, Sumatera Barat, Indonesia

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INTRODUCTION

Proverawati & Misaroh (2009) defines menarche as the beginning stage of menstruation in a girl experiencing puberty, indicating that the child has entered the stage of sexual organ maturity in her body. In the last 100 years, the age of menarche has shifted to a younger age. Aryal (2005) stated that a hundred years ago, the age of girls in Nepal who experienced menarche ranged from 15 to 19 years. Nowadays, most girls experience menarche between the ages of 10 and 16. On average, the age is 12.5 years old (Heys et al., 2007).

The average age to experience menarche in the UK, according to Proverawati & Misaroh (2009), is at 13.1 years old. Meanwhile, the average age to experience menarche in France is lower, at 12.8 years old (de La Rochebrochard, 2000). Several studies have shown this. This has decreased from an average age of 14 years old due to girls experiencing earlier development (Silva, 2005).

However, over the last 20 years in Moscow, the age of menarche has risen from 12.5 years old to 13 years old. This is especially the case for those weighing less than normal and with those who are more active (Kabir, Torkan, & Hakemi, 2007). In Indonesia, this emerging trend of the age of menarche dropping is continued. A 2010 Indonesian Health Survey concluded that the average age of menarche in Indonesian girls is at 13 years old (Riskesdas, 2010). Several studies have shown the decrease in the age of menarche in Indonesian girls. The average age of menarche has decreased from 13 years to 10 years in 2009 (Talma et al., 2013; Wulandari & Ungsianik, 2013). The study was conducted on elementary school and junior high students in East Jakarta and it proposed that menarche had already occurred at 12.3 years of age. Putra, Ermawati, & Amir (2016) conducted a study at a junior high school in Padang, and showed that the age of menarche has decreased from 9 years old to 15 years old.

Experiencing menarche at an early age will affected the physical development of adolescent girls and could cause non-communicable diseases. Studies show that early puberty (as measured by age of menarche) may increase the risk of breast cancer. According to UNICEF (2011) menarche at earlier stage will form the start of an adolescent girl's sexual exploration. Girls will begin to find interest in the opposite sex, which beforehand was not the case. An earlier menarche will also increase the chances of

endometrial hyperplasia, uterine cancer and breast cancer, as this stage of life is related to progressive oestrogen-dominated hormonal issues (Al-Agha, Alabbad, Tatwany, & Aljahdali, 2015). It could also cause certain psychological and emotional problems such as anxiety, fear and depression (Kabir et al., 2007). In a study of depressive symptoms among primary school students, there was a large discrepancy in results between girls who reached menarche at early age and boys (Trépanier et al., 2013).

Experiencing an early menarche is related to both endogenous and exogenous factors. According to Soetjiningsih (2004) the decrease in the age of menarche is associated with the nutritional status of adolescents, and according to Manuaba (2012) it is associated with the exposure of sensory stimulating information in mass media, TV and other sources. There are several research studies that have been conducted to investigate the correlation between nutritional status and an early menarche in adolescent girls (Susanti & Sunarto, 2012). These studies have proved there are significant links (Wulandari & Ungsianik, 2013).

There is limited evidence that has proved that pornographic media exposure may be related to a trend in earlier menarche. The progressive improvement of technology has risen impacts on most human aspects. One study conducted amongst junior high school students showed there was no significant relationship amongst the two variables (Dwi Kisswardhani, 2014), but the study focused on junior high students, not adolescents, and also didn't specify pornographic media. Based on the description above, a focus on how media exposure containing adult, vulgar or indulgent content affects menarche at an earlier age needs to occur. Currently, the government handles public health and protection by providing programmes that tackle reproductive health issues. These programmes include counselling that aims to fulfil the reproductive rights of adolescents (BKKBN, 2012).

The purpose of this study was to identify the correlation between pornographic media exposure and nutritional status with age of menarche.

MATERIALS AND METHODS

The design of study used a descriptive analytic method by using a cross sectional method approach. This study observed both independent and dependent variables, measured simultaneously. The population of the study was all of the female students at grade IV, V and VI in a public school in Padang. The sample size was 174 girls. The sampling method used a proportional random sampling technique. A stadiometer was used to measure the height of the students, and a scale to measure each girl's weight. The data was processed by the Body Mass Index (BMI) calculation to thus obtain the nutritional status data. In regard to the age of menarche and pornographic media exposure, the data was obtained using questionnaires consisting of 19 questions. Data has been analysed by using the chi-square test.

The confidentiality of the students was protected by the use of a de-identified database that did not contain any student identifying information. All data in the de-identified database was kept confidential and stored on secure servers that could only be accessed from password protected computers. Ethical approval for the study was received from the Ethics Committee of Universitas Andalas on the10th July 2015 with certificate number 245/KEPK/2015.

RESULTS

Table 1 shows that the highest group size contained girls that were 10 years of age (35.5%). Less than half of respondents have experienced menarche (43.0%), and some experienced early menarche (24.8%). The table illustrates that less than half of respondents had been exposed to pornographic media (57.9%). More than half of respondents had a normal nutrition status (63.6%), and 30.6% of girls were overweight. Table 2 shows that the chi-square analysis results obtained the p-value = 0.000. This result indicates that there is a significant relationship between pornographic media exposure and the age of menarche in a student. Table 3 shows that the chi-square analysis results obtained the p value = 0.000. This indicates that there is a significant correlation between nutritional status and the age of menarche of students. Students who have a good nutritional status will experience menarche at an expected age, and those adolescents who have nutritional problems may experience it at an age not regarded as usual.

DISCUSSION

The results identified a significant relationship between an exposure to pornographic media with the age of menarche in adolescent girls. The results of this study are in accordance with a statement, which said the cause of early menstruation can also

Table 1. Demographic Characteristics of the Respondents (n=121)

Variables	f	%
Age		
8	5	4.1
9	33	27.3
10	43	35.5
11	33	27.3
12	7	5.8
Age of Menarche		
Early	30	24.8
Normal	22	18.2
Late/Non-Menarche	69	57.0
Pornographic Media Exposure		
Exposed	51	42.1
Not exposed	70	57.9
Nutritional Status		
Low	7	5.8
Normal	77	63.6
Overweight	37	30.6

Table 2. Relationship between Pornographic Media Exposure and Age of Menarche

Pornographic Media Exposure	Age of Menarche						Total		P Value
	Early		Normal		Not Menarche				
	f	%	f	%	f	%	f	%	
Exposed	19	37.3	17	33.3	15	29.4	51	100	0.000
Not Exposed	11	15.7	5	7.1	54	77.1	70	100	
Total	**30**	**24.8**	**22**	**18.2**	**69**	**57.0**	**121**	**100**	

Table 3. Correlation between Nutritional Status (BMI) and the Age of Menarche

Nutritional Status (BMI)	Age of Menarche						Total		P Value
	Early		Normal		Not Menarche				
	f	%	f	%	f	%	f	%	
Low	1	14.3	4	57.1	2	28.6	7	100	0.000
Normal	5	6.5	56	72.7	16	20.8	77	100	
Overweight	24	64.9	9	24.3	4	10.8	37	100	
Total	**30**	**24.8**	**69**	**57**	**22**	**18.2**	**121**	**100**	

be affected either by the conversation or visual stimuli (TV, movies or internet) of material that can be considered adult or vulgar (Proverawati & Misaroh, 2009). The stimulation of the ears and eyes subsequently stimulates the reproductive and genital systems to accelerate genital maturation. The study conducted by Buzney & DeCaro (2012) also found psychosocial factors affected the age of menarche, which included access to westernised content. In an earlier study, it was stated that the linkage between pornographic media exposure accelerated puberty in adolescents which then indirectly leads to an earlier age of menarche (Ayuningtyas, 2013). In this study, the survey explained that the media provide most of the information containing sexual imagery, and also proved that adolescents often have easy access to prohibited content. This social factor contributed to the rapid growth of adolescent girls, decreasing the age of menarche and potentially allowing risky physical development.

The results also identified a significant relationship between nutritional status and the age of menarche. In recent study of obese adolescent girls, it was found that the nutritional status could lead to an earlier menarche (Lusiana & Dwiriani, 2007). Nutrition also affects sexual maturity in girls who have experienced their first menstruation earlier than average. These girls tend to experience more severe and frequent periods compared with those who have not menstruated at the same age. In contrast, adolescent girls whose experience menarche later weight less than adolescent girls menstruating at a normal age, irrespective of height. In general, in girls of a same age, those menstruating earlier will have a higher body mass index (BMI), and those menstruating later will have a smaller score BMI (Soetjiningsih, 2004). Excessive nutritional fulfilment brings adolescent girls to experience biological hormonal changes earlier, and this could also cause an acceleration of sexual maturation development.

Bogin (2011) stated that menarche does tend to occur earlier in adolescent girls around 20 to 30 percent above the ideal body weight, and later in adolescent girls with malnutrition. The leptin protein hormone is a form of a fat cell that plays a major role in the metabolism mechanism. It is secreted by the fat cells that have the primary function of controlling body fat and weight tissue. Leptin then triggers the release of the follicle stimulation hormone (FSH) and luteinising hormone (LH) in the ovaries, resulting in follicular maturation and oestrogen formation. Oestrogen causes negative feedback against FSH, resulting in the reduction of FSH production. The decrease in FSH levels causes late follicular growth and impacts the decreasing of oestrogen levels. The decreasing oestrogen levels cause the proliferation of endometrial blood vessels to discontinue. Therefore, the endometrial layer undergoes desquamation, resulting in the bleeding and the intangible vagina flow known as the first menstruation (menarche). The occurrence of the first menstrual cycle in adolescent girls directly affects the ability to reproduce. In overweight adolescent girls, there is an increasing of leptin secretion which can accelerate menarche (Ong et al., 2007).

This study reveals that nutritional status and pornographic media exposure of adolescent girl students will affect the age of menarche. This study highlighted is due to nutritional factors and exposure to media with insufficient content has shifted the sexual maturity. A healthy and balanced diet providing adequate nutrition and a restriction on pornographic media exposure would improve the normal growth and developmental status of the adolescent girl, and ultimately achieve the goal of approaching menarche at the normal age.

CONCLUSION

Pornographic media exposure and nutritional status are strongly associated with an early menarche in adolescent girls. The increasing frequency of inappropriate content accessed by adolescents stimulates rapid maturation among girls, and is associated with an early menarche. Meanwhile, nutritional status also contributes to the biological growth and development of adolescent girls. Further study should be conducted to identify the appropriate strategies to respond to the early menarche phenomenon and adolescent sexual development.

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Original Research

Waist Circumference as a Predictor for Menstrual Cycle Disturbance Among College Student

Ni Nyoman Trioka Rtamagustini, Bambang Purwanto and Hanifa Erlin Dharmayanti

Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Introduction: Menstrual cycle disturbance is the sign of a reproductive health problem, yet the cause tends to be multifactorial. This study aimed to analyze the risk factors of menstrual cycle disturbance which related to nutrition status among college students.

Methods: This was an observational analytical study with a cross-sectional approach. There were 59 participants taken as samples according to inclusion criteria using proportionate stratified random sampling. Data were analyzed with chi-square and multiple logistic regression test.

Results: Results found that 35.6% of participants experienced menstrual cycle disturbance. Bivariate analysis showed significant correlation between body fat percentage (p= 0.038, OR: 2.417) and waist circumference (p= 0.003, OR: 2.956) with menstrual cycle disturbance, otherwise no correlation found between Body Mass Index (BMI) (p= 0.052, OR: 2.145), subcutaneous fat thickness (p= 1, OR: 1.279), and total cholesterol levels (p= 1, OR: 1.063) with menstrual cycle disturbance. Multiple logistic regression analysis showed that waist circumference became determinant factor among other variables predicting menstrual cycle disturbance in this study (p= 0.002, OR: 7.260).

Conclusion: Waist circumference and body fat percentage were both risk factors of menstrual cycle disturbance, yet waist circumference was found being a determinant predictor to predict menstrual cycle disturbance among college student. Female students may pay particular attention to their waist circumference for detection of reproductive health problem earlier, especially regarding menstruation cycle disturbance.

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CONTACT

Bambang Purwanto
✉ bambang-purwanto@fk.unair.ac.id
Faculty of Medicine, Airlangga University, Surabaya, Indonesia

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INTRODUCTION

Menstrual cycle disturbance is a symptom of reproductive health and other health problems such as infertility, tumours, cancer, obesity, hyperinsulinemia, diabetes mellitus, and cardiovascular disease (Greenstein and Wood, 2010; Welch, 2011; Santoso, 2014). Generally, menstrual cycles tend to be irregular for several years after menarche then steadily regular at around 17-18 years old. Frequent problems arose as irregular menstrual cycle disorders were polymenorrhea (a cycle is shorter than 21 days), oligomenorrhea (a menstrual cycle is longer than 35 days), and amenorrhea (menstrual absence for more than 6 months) (Benson and Pernoll, 2008; Manuaba, et.al., 2010).

There were 38.4% cases of menstrual cycle disturbance for women aged around 16 years old reported in Sweden. Despite, the problem was also still occurred on 29.7% of 26 years old women (West, et al., 2014). While in another study, menstrual cycle disturbance was found not only experienced by women with underweight, overweight, and obesity nutrition status but also occurred in normal nutrition status (Rachmawati and Murbawani, 2015; Mustaqeem, et. al., 2015). It shows inconsistency regarding the correlation between nutrition status with menstrual cycle disturbance. Based on that fact, a preliminary study was conducted among college which showed that 30% out of 10 respondents experienced menstrual cycle disturbance.

The causes of menstrual cycle disturbance are multifactorial. Commonly, it can be caused by a disruption in a hypothalamic-pituitary-ovarian axis which related to nutrition status, physical activity, stress, and some diseases including metabolic syndrome (Rakhmawati and Fithra, 2013; Rachmawati and Murbawani, 2015; Arum, 2015; Noviandari, 2016; Yani, 2016). Recently, adolescents are also vulnerable to type 2 diabetes mellitus and metabolic diseases. Basic Health research stated that 36.6% of the population aged around 15 years old and more had experienced abnormal Fasting Glucose Level (FG), 29.9% had abnormal glucose tolerance, and 35.9% had abnormal total cholesterol level (Departemen Kesehatan Republik Indonesia, 2013).

The varied risk factor of menstrual cycle disturbance might result from suboptimal prevention and management effort. Determining risk factors related to nutrition status may enhance self-prevention and management effort among individuals. Nutritional status can be identified by weight examination, body composition, and lipid profile. The research focused on menstrual cycle disturbance that related to nutrition status based on Body Mass Index (BMI), waist circumference, body fat percentage, subcutaneous fat thickness, and total cholesterol levels is relatively rare to be found. Therefore, this research might offer a solution as it attempted to analyse the risk factors of menstrual cycle disturbance based on nutritional status in the fertile female adolescent group

This study aimed to analyze the risk factors of irregular menstruation cycle related to nutrition status. Specifically, it purposed to analyze correlation between Body Massa Index (BMI), waist circumference, body fat percentage, subcutaneous fat thickness, and total blood cholesterol levels with menstrual cycle disturbance on college students.

MATERIALS AND METHODS

This research was an observational analytical research with a cross-sectional design. The population of this study were the female college of the undergraduate program who already experienced menarche, 19-21 years old, unmarried, and willing to be a research participant were included in this study. Otherwise, those who had primary amenorrhoea, secondary amenorrhoea due to hyperprolactinemia or internal genetic tumours such as myomas and cysts, were pregnant, breastfeeding, iatrogenic menopause, using hormonal contraceptives, drugs or supplements that affect the menstrual cycle, consumed alcohol, and active smoking was excluded. Anamnesis and abdominal examination through palpation were performed to eliminate the chance of having menstrual cycle disorder due to an organic disorder. The sample size was determined using hypothesis tests for two population proportion formulas (Lemeshow and Lwanga, 1990).Total participants of 59 colleges taken using proportionate stratified random sampling technique.The study was conducted during September 2017-April 2018. Independent variables of this study were BMI, waist circumference, body fat percentage, subcutaneous fat, and total cholesterol levels. Based on Indonesian Health Ministry Nutrition Guidelines, normal standard of BMI values was (>18.5- <24.9) kg/m2, (< 80 cm) for waist circumference,(> 17.7% - <29.6 %) for body fat percentage, (<200 mg/dl) for total cholesterol, and (14-21%) for subcutaneous fat thickness. The dependent variable of this research was menstrual cycle disturbance, defined as the absence of menstruation for more than 3 cycle, shorter or longer periods of the menstrual cycle in 24-38 days of range for a year (4-5 times).

The subject was characterized on age, menarche, sleep duration, exercise, diet, anxiety stress, and menstrual profile. Data were collected using structured questionnaires and examining required measurements such as height, weight, waist circumference, body fat percentage, subcutaneous fat thickness, and capillary blood sampling for fasting total cholesterol test (approximately 12 hours-fasting). This study used Microtoise band to measure waist circumference, Tanita Scale Innerscan Body Composition Monitor and skinfold calliper to measure participants' nutritional state. Modified Anxiety Stress Scales 42 (Lovibond, 2011) was used to measure and categorize anxiety stress level of subjects into the low and normal level. Structured measurements form was used to collect menstrual profile data then categorize into normal and menstrual cycle disturbance.

Collected data were analyzed using IBM® Statistical Package for the Social Sciences (SPSS) Statistics 24 for univariate, bivariate, and multivariate analysis. Univariate analysis was performed to look into the characteristics of participants and the frequency distribution of each variable in this study. Bivariate analysis was performed using the chi-square test to identify correlation and collinearity between each independent variable with the dependent variable. Multivariate analysis was performed using multiple logistic regression test which required more than two variables being correlated to analyze and had chi-square test value of >0.25 with α=0.05. This research has been approved ethically by the Ethics Committee of the Faculty of Medicine, Universitas Airlangga with letter number 336/EC/KEPK/FKUA/2017.

RESULTS

Characteristics of participants are described in Table 1. Participants with menstrual cycle disturbance (35.6%) were found less than regular or normal menstrual cycle (64.4%). Age distribution in this study ranged from 19 to 21 years old. Participants whose age at around 19 and 20 years old (35.6% and 39.0%) were found more than those who were 21 years old (25.4%). Age of menarche ranged from 10

Table 1. The Distribution for Characteristics of Participants (n= 59)

Characteristics	Category	Frequency (n)	Percentage (%)
Age	19 years old	21	35.6
	20 years old	23	39.0
	21 years old	15	25.4
Menarche	10 years old	2	3.4
	11 years old	14	23.7
	12 years old	15	25.4
	13 years old	12	20.3
	14 years old	16	27.1
Sleep duration	<8 hours/day	50	84.7
	≥8 hours/day	9	15.3
Exercise	Yes	7	11.9
	No	52	88.1
Vegetarian	Yes	4	6.8
	No	55	93.2
Soybean consumption	Yes	55	93.2
	No	4	6.8
Stress	Normal	36	61.0
	Low	18	30.5
	Moderate	5	8.5
Menstruation cycle	Irregular	21	35.6
	Regular	38	64.4

Table 2. The result of Bivariate Analysis Using Chi-Square (n= 59)

Variable	Menstruation cycle				Total		p-value	Odds Ratio
	Irregular		Regular					
	(n)	(%)	(n)	(%)	(n)	(%)		
BMI								
Abnormal	11	52.4	9	23.7	20	33.9	0.052	2.145
Normal	10	47.6	29	76.3	39	66.1		
Waist Circumference								
Abnormal	11	52.4	5	13.2	16	27.1	0.003	2.956
Normal	10	47.6	33	86.8	43	72.9		
Body Fat Percentage								
Abnormal	15	71.4	15	39.5	30	50.8	0.038	2.417
Normal	6	28.6	23	60.5	29	49.2		
Subcutaneous Fat Thickness								
Abnormal	19	90.5	33	86.8	52	88.1	1	1.279
Normal	2	9.5	5	13.2	7	11.9		
Total Cholesterol Levels								
Abnormal	3	14,3	5	13.2	8	13.6	1	1.063
Normal	18	85.7	33	86.8	51	86.4		

Table 3. The result of First Step Multiple Regression Logistic Analysis

Variable	B	Sig	OR	CI 95%	
				Lower	Upper
Body Fat Percentage	0.462	0.543	1.587	0.359	7.021
BMI	0.794	0.221	2.211	0.620	7.879
Waist Circumference	1.426	0.088	4.161	0.810	21.368
Constant	-1.569	0.002	0.208		

Table 4. The result of Third Step Model Regression Logistic Analysis

Variable	B	Sig	OR	CI 95%	
				Lower	Upper
Waist Circumference	1.982	0.002	7.260	2.035	25.904
Constant	-1.194	0.001	0.303		

years old until 14 years old. Majority of participants complained having bad sleep duration which was less than 8 hours/day (84.7%) and did not frequently exercise per week (88.1%). Most of the participants had a normal level of stress (61.0%), with only (8.5%) participants mentioned having a moderate level of stress. Most of the participants had a non-vegetarian diet (93.2%) and consumed soybean (93.2%).

The result of chi-square analysis could be seen in Table 2. The correlation was found on both analysis between waist circumference with menstrual cycle

disturbance, and between body fat percentage with menstrual cycle disturbance with a p-value < 0.05 (p= 0.003 and p= 0.038). Whereas different results were found on the correlation between BMI, subcutaneous fat thickness, and total cholesterol levels with menstrual cycle disturbance (p-value > 0.05). An odds ratio value of all variables were at more than one. An odds ratio value of 2.956 for correlation between waist circumference with menstrual cycle disturbance indicated college students with > 80 cm waist circumference had 2.956 times riskier than those with normal waist circumference.

Multiple logistic regression was performed to determine the predominant factor for menstrual cycle disturbance. The result could be seen on table 3 and 4. There were three variables as candidates of menstrual cycle disturbance predictor, as in body mass index, waist circumference, and body fat percentage. A variable with the greatest significant p-value is eliminated gradually until we obtained a model with significant value below to 0.05. The multiple regression model analysis resulted in only waist circumference as a determinat risk factor. It suggested that waist circumference as the only determinant risk factor of menstrual cycle disturbance on this study. Based on multiple logistic regression with OR value of 7.2, it could be suggested that college students who had abnormal waist circumference would be 7.2 times riskier to have menstrual cycle disturbance than those with normal waist circumference.

DISCUSSION

Five independent variables were analysed as predictor candidates for menstrual cycle disturbance. There were three of five variables correlated to menstrual cycle disturbance, i.e. body mass index, waist circumference and body fat percentage.The previous study has exposed a significant correlation between irregular menstrual cycle and waist circumference. It assumed that waist circumference was associated with menstrual cycle disturbance (Song, et. al., 2016). Another previous study had a similar result, of which assumed that oligomenorrhea was correlated with waist circumference (Seif, Diamond, and Nickkhoo-Amiry, 2014).

Abnormal waist circumference indicates that there is an accumulation of fat stored exceeding its normal part in the abdomen. It is also called central obesity or central adiposity. Therefore, central obesity occurs when there is an accumulation of fat around the abdomen region particularly at the abdomen cavity in the outer wall of the intestine (Cahyono, 2008).

Obesity is determined using such BMI measurement which calculates weight and height, body fat percentage, subcutaneous fat thickness and waist circumference. Measurement of waist circumference was relatively easier to do, but it was proved more accurate to describe central obesity than other variables (National Health Service, 2016). Our findings confirmed that waist circumference was the only variable in the logistic regression model to predict menstrual cycle disturbance. In addition, obesity also as a risk factor of hormonal abnormality which correlates to a reproductive problems such as infertility, PCOs, and menstrual irregularity. Obesity was known as the risk of chronic anovulation (Seif, Diamond, and Nickkhoo-Amiry, 2014).

Due to obesity, chronic anovulation occurs in three ways as in high peripheral aromatization of androgens, low level of Sex Hormone Binding Globulin (SHBG) production, and insulin resistance (Fritz and Speroff, 2011). High peripheral aromatization of androgens leads to chronically accelerated estrogen concentration. Androgen also functions as estrogen precursor. Therefore, estrogen is not only derived from the ovary but also from its precursor. While a low level of SHBG production in the liver may increase circulating concentrations of free testosterone and estradiol in the blood. As for insulin resistance, it results in androgen production in the ovarian stroma. Higher concentration of local androgen might disrupt the development of follicle. Disturbances in the follicle process can cause chronic anovulation. Particular weight loss program decreases blood insulin and androgen levels, it also restores the ovulatory function of menstrual cycles (Fritz and Speroff, 2011).

The factors affecting waist circumference are age, physical activity, energy intake, genetic, alcohol, and stress (Ranggadwipa and Murbawani, 2014; Rasdini, 2016). Physical activity may decrease when someone gets older. Excessive diet and lack of physical activity impair on increasing the waist circumference. Excessive calories are found in fast foods, processed meats, margarine, canned vegetables, and recycled cooking oil.The type of foods that may trigger glucose production in large quantities.

The pancreas has a function to secrete insulin and convert it into the energy that is essential for the cell metabolism. Improper catabolism activity result in disruption of that function which leads to excessive fat stored in more parts of the body and eventually also leads to central obesity. While an individual may have a tendency to have fat accumulation in the abdomen genetically, but it may be avoidable if radical weight gain did not occur. On the other hand, alcohol consumption may result in decreasing fat burning efficiency. Fat accumulation will occur if there is no lifestyle changing by reducing alcohol. At last, stress and lack of sleep can increase production of the cortisol hormone which disposes fat accumulating in the stomach. Therefore, avoiding those risk factors may be beneficial to maintain normal waist circumference.

Fats disturb hormonal secretion level and balance that regulate menstruation cycle by shaping, converting, and storing reproductive hormones. Excessive fat can cause blood vessel hyperplasia. The blood vessel will be suppressed by fat tissue

resulting in a disruption on blood circulation in the reproductive system becomes (Rachmawati and Murbawani, 2015). On the other hand, massive weight loss and underweight condition decrease gonadotropin hormones that secrete LH and FSH. It may also decrease the estrogen level and stimulate anovulatory condition which leads to the menstrual cycle disturbance (Hidayah, Rafliudin, and Ronny, 2016).

Androgen excess in women with PCOS and obesity may be accompanied by abnormal metabolic conditions, which is characterized by increasing abdominal fat and decreasing lipolysis in subcutaneous fat (Kim et. al., 2014). Lifestyle management by regulating considerable physical activity, reducing fast-food consumption, healthy eating habits, keeping the ideal BMI are few ways to improve reproductive health, particularly in maintaining regular menstrual cycle (Jena, Panda, Mishra, and Narahari, 2017).

Previous studies suggested that cholesterol has no correlation with menstrual irregularity. Women with a history of menstrual cycle disorders had a higher risk to suffer from diabetes mellitus (Dovom, et. al., 2016). Similarly, this study showed that total cholesterol levels did not have a significant relationship with menstrual irregularity. Normally, menstrual irregularity often occurs at the beginning of the menarche. Despite menstrual cycle disorders are likely to occur in upcoming years, metabolic disorders screening may become beneficial for prevention efforts.

CONCLUSION

This study showed a correlation between waist circumference and body fat percentage with menstrual cycle disturbance. Otherwise, no correlation was found between BMI, subcutaneous fat, and total cholesterol level with menstrual cycle disturbance. While college student with abnormal waist circumference and body fat percentage were shown being at more risk to develop menstrual cycle disturbance. Waist circumference was proven as a predictor to determine menstrual cycle disturbance among college student. Future investigation is needed to explore more some variables which involve in menstrual cycle disturbance mechanism related to obesity such as free radicals, proinflammatory cytokine and hormones.

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Original Research

Red Ginger (*Zingiber officinale var. rubrum*) Massage Reduces Stiffness and Functional Disability in Elderly with Osteoarthritis

Putu Indraswari Aryanti[1], Joni Haryanto[2] and Elida Ulfiana[2]

[1] Faculty of Nursing, Universitas Katolik Widya Mandala Surabaya, Indonesia
[2] Faculty of Nursing, Universitas Airlangga, Surabaya, Indonesia

ABSTRACT

Introduction: Recent research has provided data on the efficacy of the massage therapy and the role of essential oil in the management of osteoarthritis (OA) symptoms. Although both areas of research have demonstrated strong evidence that the muscles and massage with essential oil may affect OA symptoms, massage with essential oil applied on the quadriceps muscle has received no attention. The purpose of this study was to identify the effect of red ginger massage on joint stiffness and functional disability in elderly with osteoarthritis.

Methods: This study was a randomized control group pre-test and post-test experimental study design involving 62 elderly with osteoarthritis divided into two groups namely red ginger massage and control groups by random cluster sampling. The instrument used was Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). Statistical test used were paired t-test and MANCOVA.

Results: Baseline value of stiffness and functional disability in intervention group were 4.47 ± 1.717 and 35.93 ± 12.806. After 8 weeks stiffness and functional disability became 2.40 ± 1.380 and 19.50 ± 9.420 Stiffness and functional disability were decreased on intervention group with p-value 0.000 and 0.004. It means there was influenced by red ginger massage on stiffness and functional disability in elderly with osteoarthritis.

Conclusion: Red ginger massage can be applied as a complementary treatment to help reduced joint stiffness and functional disability in addition to standard drug treatment usage in osteoarthritis disease.

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CONTACT

Putu Indraswari Aryanti
putu.aryanti@ukwms.ac.id
Faculty of Nursing, Universitas Katolik Widya Mandala Surabaya, Indonesia

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INTRODUCTION

Osteoarthritis is a progressive chronic disease which affected 178,415 elderly in Indonesia (Linton, 2012; Ministry of Health, 2013b). Factors causing osteoarthritis are obesity, aging, trauma, genetic predisposition and work (Amin, 2015; Kruger, Khumalo, & Nadene, 2017). The prevalence of osteoarthritis was 45% in age 55-64 years old, 51,9% in age 65-74 years old and 54,8% in age more than 75 years old (Ministry of Health, 2013a). The majority of people with osteoarthritis worked as laborers (31.2%) professions (23.4%), employees (15.4%), self-employed (23.7%) and others (24%) (Ministry of Health, 2016).

Management of osteoarthritis disease usually focuses on reducing pain and joint stiffness in which non-pharmacological treatment became the first priority (Amin, 2015; Pawanti, Untari, & Nansy, 2015). The therapy include educating clients about diseases, diet overweight counselling, physical therapy, use of tools and orthotics such as sticks, and surgical procedures (Hamijoyo, 2012). If necessary, drug therapy may be administered to clients with osteoarthritis including analgesic drugs such as Paracetamol and Acetaminophen as first line therapy which is considered to be safest for long-term consumption (Amin, 2015; Dewanto, 2003). However, if not successful, it will be replaced by Non-Steroidal Anti-Inflammatory Drugs or NSAIDs though it has adverse effects on liver and kidney organs (Sukandar et al., 2013). The mildest side effects that may arise are nausea, gastric pain and dyspepsia and the most serious is lesions, bleeding

and perforation of the gastrointestinal tract (Hussain & Farnaz, 2013). These adverse effects encourage researchers to develop management of osteoarthritis without causing harmful effects to the patient. One of them is the utilization of ginger massage as a complementary treatment option.

Currently, there has been a trend in Indonesian society, especially in urban communities to utilize traditional health services as they prefers a proactive approach for their well-being (Hussain & Farnaz, 2013; Widowati & Nurhayati, 2017). One of the alternatives is traditional medicine using herbs, including ginger that has been used in many parts of the world even since antiquity (Dhanik, Arya, & Nand, 2017). Red Ginger with scientific name *Zingiber officinale var. rubrum* has been used as a remedy in the Chinese herbal tradition, Ayurveda and Tibb-Unani (Ali, Blunden, Tanira, & Nemmar, 2008). Among the benefits of red ginger, the effects of anti-inflammatory and circulatory stimulants are the most important for clients with osteoarthritis (Ali et al., 2008). Several experimental studies have shown that the gingerol content of red ginger inhibits the synthesis of pro-inflammatory mediators Prostaglandin-E4 (PGE4) (C. Shen, Hong, & Kim, 2005) and nitric oxide in chondrocytes and leukotriene-B4 (LTB4) in vitro (Blumenthal, 2003). In clinical explanations, it may decrease the level of pain and inflammation associated with osteoarthritis (Leach & Kumar, 2008). Part of the ginger plant used is rhizomes, fresh, dried or extracted (Dhanik et al., 2017).

A study found that the use of moxibustion along with fresh mash ginger at the acupuncture point provides beneficial therapeutic effect for clients with arthritis (Xie & Lei, 2008). Ding, Leach, Hons, & Bradley (2013) mentioned that research on topical ginger application has been done on several different conditions including osteoarthritis and no adverse event being reported. However this review cannot conclude about the effectiveness of topical use of ginger for osteoarthritis.

Massage is known as the easiest affordable complementary treatment options in the community and has been used for many years due to its effectiveness (Ali et al., 2017). Massage is defined by Fitzgerald & Oatis (2004) as passive movements given in order to improve joint movement ability or decrease joint stiffness. Massage is useful for supporting circulation and reverse veins, providing neurological effects, modifying muscle physiology in overcoming hypertonicity, spasm and decreasing musculoskeletal pain (Green, 2013). Field (2016) says that massage can be done to reduce the pain of osteoarthritis joints. The functioning massage generates the meridians, warms the deep ducts, removes the cold, and improves blood circulation, and makes significant improvements to knee function (Shen & Cui, 2015).

Aromatic massage with a mixture of orange and ginger essential oils in the elderly with osteoarthritis has been done by Bing, Chung, & Tam (2008) found that massage was able to have a positive effect on the signs and symptoms of osteoarthritis (pain, stiffness and functional disability). Atkins & Eichler (2013) found that the dose of an effective massage for the elderly with knee osteoarthritis was 8 weeks in 2 sessions each week. Additionally, the research conducted by Nasiri, Azim, & Nobakht (2016) showed that the administration of aroma massage with essential oils as much as 3% was able to give positive effect to clients with osteoarthritis. So the combination of the use of massage with the use of red ginger essential oil is expected to give a positive impact on the reduction of stiffness and functional disability clients with osteoarthritis. However, the effect of red ginger massage on stiffness and functional disability in elderly with osteoarthritis has not been proven. Respondents' satisfaction and side effects from giving this massage will be noted.

Based on these findings, the authors considered that it is necessary to identify the effects of aromatic massage of pure red ginger of signs and symptoms of osteoarthritis. Therefore, the purpose of this study was to identify the effect of red ginger massage on joint stiffness and functional disability in elderly with osteoarthritis.

MATERIALS AND METHODS

Study Design and Participants

This study was a randomized control group with pre-test and post-test experimental design. Single blinding was applied in this study. The research was carried out on a voluntary basis among members of the three public health centers (PHC) in Surabaya, Indonesia. The participants were recruited via a list of elderly with osteoarthritis from each PHC.

Sample size calculation performed based on different proportion of independent sample formula at $\alpha = 0.05$. It was found that the expected total number of participants was 64 with 32 respondents in intervention and control group However, only 62 respondents can be involved in this study based on inclusion criteria for 4,419 population. The inclusion criteria were those who had knee joint pain over the past month, aged 60 - 85 years (based on elderly criteria in Indonesia), used piroxicam and had good cognitive ability (MMSE score 24-30). The participants were excluded if they were those who underwent physiotherapy for knee joint pain, did routine exercise more than once a week, had operated wound in joint and leg area over the past six months, were sufferred from cancer, rheumatoid arthritis, gout or any serious illness and were suffering from contagious skin illness.

Participants who were eligible and willing to participate in the study were requested to sign a consent form before undergoing treatment. Participants were assigned to one of two groups based on their living area.

Red Ginger Massage Treatment Protocols

Participants in the intervention group received a session of 20 minutes of red ginger massage on both lower limbs sixteen times within eight weeks. The intervention group received massage with red ginger oil (3.33% red ginger oil in virgin coconut oil). The red ginger essential oil obtained from laboratorium in Yogyakarta, Indonesia. Virgin Coconut oil was selected as the base because it was relatively less costly, safe for dry and delicate skins, easy to make and obtain compared to other carrier oils. The control group received no massage but conventional treatment during the study (piroxicam). However, the same massage session was given to the control group after study as a service. The same supply of oils and dilutions were used throughout the study. Effleurage and petrissage were applied over the front and side of both legs of the participants. Various muscles on the thigh were massaged: quadriceps femoris, gracillis, and biceps femoris. Recommended pressure massage between 100-118.7 mmHg. The massage treatment was given by a nurse with training in leg aroma-massage. Their skill were assessed and evaluated by an experienced masseur. Participants in the control group received same massage treatment after eight weeks.

Outcome Measures

Demographic information of the respondents included age, sex, body mass index, herbal consumption, medicine consumption, long time of osteoarthritis diagnosed, exercise frequency per week, massage habit per 12 month.

The primary outcome were knee joint stiffness intensity and physical functioning. They were measured by the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC). It consisted of 19 questions assessed on likert scale, analyzed as 2 subscale with average score 2 questions on stiffness and 17 questions on physical function. Some countries that have tested the validity and reliability of these instruments stated that the WOMAC index is a very reliable and valid instrument for evaluating the signs and symptoms of osteoarthritis. WOMAC already translated by The Indonesian Rheumatology Association (IRA) into Indonesian language. By the every end of treatment completion, the participant were asked about their feedback about the intervention.

Data Collection Procedures

WOMAC questionnaires and cognitive assessments (Mini Mental State Examination or MMSE) were performed by third-year nursing students by face to face interviews. Before doing interviews, the nursing students got an explanation and training for massage inform consent, WOMAC and cognitive assessment. In this study, the data collector and all participants were blinded to the group allocation. Besides, the nurse who gave the red ginger massage was not involved in the data collection of outcome measurements except the general feedback toward the massage process. Data were collected at three time points namely before intervention (baseline assessment), one hour after the completion of treatment at week 8th and one hour after completion of every treatment schedule.

Data Analysis

Normality checking of the outcome data was examined by the Kolmogorov-Smirnov test with $p > 0.05$ indicating that the data were normally distributed and that parametric statistic should be performed. Subsequently, we compared the baseline characteristics of participants from the control and intervention group using paired t test and MANCOVA to describe difference between the control and intervention group after 8 weeks intervention. The level of significance was 0.05 (one-tailed) for all test. All of the analyses were completed using SPSS.

Ethical Clearance

This research has been approved by the Commission of Health Research Ethics Faculty of Nursing Universitas Airlangga no. 685-KEPK by date 7th March 2018.

RESULTS

Participants socio-demographic and knee pain related characteristic

Of the 62 participants recruited in this study, 60 (96.7%) participants completed eight weeks intervention consisted of 16 session of red ginger massage. There were 2 drop-outs participant with private reasoned without any concerned with the study. The majority of the 60 participants were women (97.1%), the majority of the age category was 60-74 years (88.3%) and the majority category of BMI was normal. The rate of herb consumption were the same between the treatment and control group at 50%. The majority of the respondents took standard osteoarthritis therapy (piroxicam) once a day (60%). The majority of long time diagnosed of osteoarthritis are less than 1 year (38.3%), the majority of knee pain is left knee (40%), the frequency distribution of exercise per week was the same in the category never and once per week, and the majority of habitual massage in 12 months is 2-4 times (50%) (Table 1).

Table 2 Comparison of the mean change in the WOMAC subscale among intervention and control groups from baseline to post an eight weeks.

Effect on knee stiffness relief and functional disability

Table 1. Demographic Characteristics of Intervention and Control Groups at Baseline

Sociodemographic data		Group	
		Intervention (n = 30) frequency (%)	Control (n = 30) frequency (%)
Age			
Elderly	60 - 74 y.o	25 (83.33)	28 (93.33)
Older Elderly	75 - 90 y.o	5 (16.67)	2 (6.67)
Sex			
Female		27 (90)	28 (93.33)
Male		3 (10)	2 (6.67)
Body Mass Index (BMI)			
Normal	BMI ≥ 18.50 - 24.99	13 (43.33)	16 (53.33)
Overweight	BMI ≥ 25.00 - 27.00	10 (33.33)	7 (23.33)
Obesity	BMI ≥ 27.00	7 (23.33)	7 (23.33)
Herb consumption			
Yes		15 (50)	15 (50)
No		15 (50)	15 (50)
Drug consumption			
Once a day		23 (76.67)	13 (43.33)
Twice a day		7 (23.33)	17 (56.67)
Long-time diagnosed with osteoarthritis			
≤ One year		11 (36.67)	12 (40)
1 - 3 years		12 (40)	9 (30)
4 - 9 years		4 (13.33)	7 (23.33)
≥ Ten years		3 (10)	2 (6.67)
Knee pain site			
Unilateral knee		15 (50)	24 (30)
Bilateral knee		15 (50)	6 (20)
Exercise frequency per week			
Never		15 (50)	15 (50)
Once		15 (50)	15 (50)
Massage habit per 12 months			
Never		9 (30)	6 (20)
Once		5 (10)	9 (30)
2-4 times		15 (50)	15 (50)
Routine		3 (10)	0

Table 2. Comparison of the Mean Change in the WOMAC Subscale Among Intervention and Control Groups from Baseline to Post an Eight Weeks

WOMAC	Baseline (Mean ± S.D.)	Post 8 week (Mean ± S.D.)	Within group p-value[a]
Stiffness (0-8, ↑ worse)			
IG	4.47 ± 1.717	2.40 ± 1.380	0.000
CG	4.70 ± 1.601	4.63 ± 1.542	0.161
Between-groups p-value[b]		0.000	
Function disability (0-68, ↑ worse)			
IG	35.93 ± 12.806	19.50 ± 9.420	0.000
CG	43.03 ± 10.975	28.33 ± 11.583	0.000
Between-groups p-value[b]		0.004	

CG = Control Group; IG = Intervention Group; S.D. = Standard Deviation; WOMAC = Western Ontario and McMaster Universities Osteoarthritis Index; a = p-value calculated by paired t test for within group comparison; b = p-value calculated by MANCOVA for between group comparison.

The decrease of knee joint stiffness in treatment group had p=0.000 while control had p=0.161 after eight weeks. In addition, the difference between the control group and the treatment time over eight weeks was p=0.000. Furthermore, the reduction of functional disability in the treatment group had p=0.000 while the control group had p=0.000 over eight weeks. The difference between control group and treatment after eight weeks was p=0.004 (Table 2).

DISCUSSION

The analysis in each group found significant decreased in stiffness and functional disability at the post eight weeks after intervention for the intervention group, but not for the control group. These results are consistent with the results of the intervention study of ginger extract and aroma of ginger massage to decrease stiffness and functional disability in participants with osteoarthritis (Bing,

Chung, & Tam, 2008; Masoud, Ali, Tayebeh, & Shohreh, 2005; Zakeri, Izadi, Bari, Soltani, & Narouie, 2011). It suggests that ginger may be used as an anti-inflammatory and analgesic to relieve stiffness in the elderly with osteoarthritis. Essential oils contain sesquiterpenoids (such as zingiberene, α-curcumene, β-bisabolene, α-farnesene), monoterpenoids (such as β-sesquiphellandrene and camphene), the phenolic concepts of sharp red ginger (gingerol and shogaol 5-8%) , lechitin, protein, starch (60%), vitamins, minerals and others (B. H. Ali et al., 2008; Ali Hasan, 2012; Young et al., 2006). The combination of massage movements was effleurage (circular motion carried out with the palm of the hand), tapotement (hands hit soft tissue with rhythmic rhythms) and friction. Based on previous research, these massage movements able to improve physical function of participants with osteoarthritis (Atkins & Eichler, 2013; Bing et al., 2008; Juberg et al., 2015). Combination of massage and essential oil works synergistically can affects the decrease in stiffness resulting in decreased functional disability.

Stiffness in osteoarthritis caused by osteophyte formation in the result of an inflammatory process involving leukotrin activation (Sowers, Karvonen-gutierrez, Jacobson, Jiang, & Yosef, 2011). Therefore using red ginger massage reduces inflammation in the area around the knee joint due to the massage process. In addition it will help reduce symptoms of joint stiffness in osteoarthritis. There were two participants who got the highest stiffness score in the treatment group and did not change after being given a mixture of red ginger for eight weeks. The initial situation in the respondent's joints is definitely not always the same. However, this study did not use radiological criteria in responding to osteoarthritis screening, so the researcher could not ensure whether the osteophytes in the respondent had occurred.

Based on the analysis result, differences in the functional disability in the control and treatment groups seen in several point of the WOMAC subscale fuctional disability. On point such as the difficulty of participants in doing activities up and down stairs, standing, walking in a flat surface, and shopping. There are quite a number of changes in participant score. That question majority asking about respondent's knee function. In the treatment group that received red ginger massage in this study experienced a decrease in stiffness therefore the function of the quadriceps muscle knee joint to support body weight was better than before receiving the red ginger massage. Furthermore on certain questions about the difficulty of respondents to stand up from sitting, bending the floor, getting out of bed, lie down in bed, sit down, heavy household chores and light household chores there are not many changes in value. The majority of the questions asked about whole joint function and were not specific to the knee function of the respondents.

Participants of red ginger massage intervention did not report any adverse event or allergies regarding the use of red ginger essential oil. Therefore, we used the highest concentration of red ginger essential oil of 3%. According to previous study no adverse event reported of using ginger massage (Bing et al., 2008; Ding, Leach, Hons, & Bradley, 2013).

Massage belongs to complementary and alternative treatments within the category of manipulative and body based (Moquin, Blackman, Mitty, & Flores, 2009). A massage is a form of cutaneous stimulation while the use of red ginger essential oil as anti-inflammatory and enhanced blood circulation in osteoarthritis and as an aromatic that provides a relaxing effect. Massages have been shown to reduce pain and improve the health and wellbeing of the elderly as a professionally managed complementary therapy (McFeeters, Pront, Cuthbertson, & King, 2016). According to Louisiana in Sparber (2011), complementary therapies describe the integrative nature of nursing practice and is a vast domain of healing sources that enable nurses to increase supportive or restorative care for life and well-being.

CONCLUSION

In conclusion, the results of our study showed sixteen red ginger massage sessions using a mixture of red ginger essential oil and virgin coconut oil were able to reduce joint stiffness and functional disability in the elderly with osteoarthritis. No adverse event was reported during the study. Therefore, red ginger massage can be recommended as one of the complementary methods for osteoarthritis treatment management.

Our findings on stiffness found that the initial state of joint stiffness in participants was not the same. Several factors such as the inflammatory process and the formation of bone osteophytes also aggravate joint stiffness. However, this study did not use radiological criteria in osteoarthritis screening. Thus, we recommend that future study including radiologic criteria in osteoarthritis screening. High concentration of red ginger oil usage, which is 3%, has not been evaluated for the duration of the effect for stiffness relief, expected that further studies needed to find the right dose for stiffness relief.

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Original Research

Life Writing Therapy Decreases Depression in Late Adolescence

Zulaikah Nur Istiqomah, Erna Erawati and Suyanta Suyanta

Nursing Department of Health Polytechnic Kemenkes, Semarang, Indonesia

ABSTRACT

Introduction: Late adolescence (16-18 years old) usually experiences a crucial period in life which makes teenagers vulnerable to mood disorders such as depression. One of the interventions that can decrease depression is writing a memoir, biography, diary, and life writing. Writing can disclose the feeling and help mind care. The objective of this study was to investigate the influence of life writing therapy to decrease depression in late adolescence.

Methods: This study used pretest-post-test control group design with 40 people as samples, divided into intervention and control groups. Before and after the treatment, both groups were measured using the scale of the PHQ-9A to see the depression in late adolescence of high school students.

Results: Life writing therapy shows differences in mean between intervention group and control group with a p-value of 0.000 (α <0.05).

Conclusion: The life writing therapy has an effect in reducing depression in students. It facilitates subjects to evaluate, analyze, and reassess past, current and future events so that subjects can get an understanding, develop a solution and self-motivation, accept the existing situation, learn from what is experienced, focus thoughts on positive things, and assess positive things from an event.

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CONTACT

Zulaikah Nur Istiqomah
✉ zulaikahnuristiqomah@gmail.com
Nursing Department of Health Polytechnic Kemenkes, Semarang , Indonesia

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INTRODUCTION

The term adolescence comes from Latin word adolescere (noun, adolescentia which means teenager) which means "to grow" or "to grow into adulthood". The term adolescence, as used nowadays, has a broader meaning including mental, emotional, social and physical maturity (Hurlock, 2002). The term adolescence, once a synonym for puberty, is now more emphasized stating the psychosocial changes that accompany puberty. However, the acceleration of somatic growth which is part of physical changes at puberty is called adolescent growth spurt (Soetjiningsih, 2010).

Adolescence is a transition period between childhood and adulthood followed by biological, cognitive, and socioemotional changes (Santrock, 2014). Adolescence has a broad meaning including mental, emotional, social, and physical maturations (signs of secondary sex, maturation of reproduction, a way of thinking is more abstract, logical, and idealistic, emotionally more labile, and the relationship with peers become more intimate). Adolescence is divided into two stages, early and late adolescences. Early adolescence usually lasts roughly from 13-16 years old, while late adolescence starts from 16 or 17 years old to 18-years-old. During the late adolescence, teenagers commonly spend their times studying at high school. In addition, they experience a crucial time in life because they live in transition period between adolescence and adulthood. When teenagers are in the last year of high school, their parents usually consider that they are almost an adult and about to enter higher education or receive specific job training. Being student also makes them aware of the responsibilities they had never thought before (Hurlock, 2002).

Awareness of new formal status, either at home or at school, has encouraged most of teenagers to behave in a more mature way. However, looking at the juvenile psychological mental status, it is not stable yet. In addition, some of them assume that this responsibility is a huge burden. Pressure from parents, schools, and environment can make

teenagers feel frustrated or stressed because of the lack of gain in self-fulfillment (Soetjiningsih, 2010).

Inability to deal with stressors or pressures has led teenagers to the risk of disorders moods such as depression to behave detrimental both for themselves and others. Most of the depressions in adolescents are undiagnosed. Psychological developments commonly found in adolescence include emotional disorder, excessive introspection, and high sensitivity. As a result, the symptoms of depression are considered as part of the change in adolescent development. In fact, depression is a normal response phenomenon to negative life experiences, such as loss of family, valuables or social status. Depression can be seen as a continuum that moves from normal depression to clinical depression (Murti, 2012). Caron in Aditomo (2004) mentions the normal symptoms of depression such as feelings of not getting excited, feeling of hopeless, etc. that usually do not last long or minor depression. Coping with these symptoms, a new perspective that is more mature will appear; thus, normal depression could be seen as an adaptive experience. Depression becomes maladaptive and abnormal when appear in high intensity and settle or major depressive disorder.

Depression in teenagers is basically a disorder that affects affective regulation. In particular, this disorder appears to cause problems by initiating, maintaining, or modifying the quality, intensity, or affective response time. The key aspects of this disorder, especially the sedentary low mood and anhedonia typical of depressive episodes, can be conceptualized as changes in affective regulation. Both the intensity and duration of the affective stage appear abnormal in depression as showing changes in the regulatory affective process (Forbes, Silk, & Dahl, 2009).

BPS Kota Magelang (2015) states that the population of adolescents at the age of 15-19 are 10.759 teenagers and the numbers of student who study at high school in Magelang are about 4,716 students. Lentera Jiwa (2015) in one of their articles mention the results of a survey conducted in 50% of schools in Magelang ranging from early childhood through high school in June 2014. The survey shows a comparison of the number of children and adolescents who had problems in Magelang, i.e. mental-emotional disorders. Longitudinal research conducted by Sihvola et al. (2016) on 1854 respondents indicates that minor depression is more common in adolescents than major depression with a ratio of 12%: 2.5%.

This percentage indicates the importance of research to assess effective method in reducing depression in adolescents. Some types of interventions have been studied for its effectiveness in reducing depression. One of the therapies that can be done is Cognitive Behavior Therapy that drives to think of realistic and positive about themselves, environment and future whether in dialogues or writing. Life Writing is one of cognitive therapies by writing the stories, memoirs, biographies, diaries (Progoff in Pranoto, 2015). Research conducted by Pennebaker about emotional writing has also proven that writing can help heal the effects of trauma (Pranoto, 2015).

In addition, writing will stimulate the brain to organize his thoughts, pour emotions and feelings, and help solve problems. Writing a diary or life writing therapy is the treatment to write the easiest thing to do. Domar in Rais & Hidayati (2009) states that writing is a step to express emotions and feelings and help care for the mind. The effect of writing in alleviating depression has also been investigated by Qonitatin (2011). In these studies, there is a significant influence on students who have mild depression. Through expressive writing therapy, emotional experiences as catharsis or emotional release their lower levels of mild depression. The objective of this study is to examine the effect of life writing therapy in decreasing depression in late adolescence.

MATERIALS AND METHODS

This study was a quasi-experiment research with the pretest-posttest control group design method. The research was conducted in a high school in Magelang from January to February 2017. The population of this study was 146 students of the 12th grade who experienced depression based on the preliminary study conducted by researchers. The samples were selected using the purposive sampling technique based on inclusion criteria, i.e. the subjects were the 12th grade student at the age of 16-18 with depression scores between 10-27 (mild depression to severe depression using PHQ-9A), able to write, and had never been exposed to depression-related therapy. There were 40 samples who were divided into two groups, intervention and control groups consisting of 20 students for each. The groups were divided using simple random sampling with statistic application where samples have the same opportunity.

The data collection tool uses a modified PHQ-9A scale measuring tool for teens (Patient Health Questionnaire-9 Adolescence), i.e. a tool to measure the scale of depression in adolescents with Likert scale 0-3 consisting of 9 questions, each of which represents an indicator of depression for approximately 2 weeks last. This questionnaire has been tested for validity and reliability. The validity test showed that the question items were valid with a correlation value between 0.434 - 0.826 at the 95% significance level. The value of reliability in this questionnaire was 0.822; thus, the questionnaire was reliable or trusted.

The ethical considerations were met, as the participants signed an informed consent form. After obtaining approval from all respondents, it was subjected to an initial reassessment or pretest as a baseline to strengthen screening data in both the intervention and control groups. The intervention

was carried out for 4 weeks with a total of 8 meetings containing 3 sessions of writing with a different topic for approximately 45-60 minutes simultaneously at each meeting. Respondents were given workbooks related to interventions consisting of several commands for life writing therapy that could be written every day and done at home. Post-test was conducted after the follow-up during the last week of intervention. The media used in this study were workbook, observation sheet, and evaluation sheet. This research study received ethical clearance approval from the ethics committee of the research and community service units of the Health Polytechnic Kemenkes Semarang No. 1475 in 6th February 2017.

RESULTS

The respondents were 40 students of the 12th grade divided into two groups: the intervention and the control groups. During the research, there were no respondents who dropped out and all of them were included in the analysis. Most respondents were at age of 17, 60% in the intervention group and 75% in the control group. Based on the sex, most respondents were female, 50% in the intervention group and 65% in the control group. 77.5% respondents were Science Class and 22.5% respondents were Social Class (Table 1).

Table 2 shows that the average pre-test score in the intervention group is 8,9 and post-test score is 4.8,and the difference between pre-test and post-test score are 4.10 (Table 2). Meanwhile, the control group shows the average pre-test score of 8.55 and average post-test score of 8.40; thus, the difference between pre-test and post-test is 0.15 (Table 2).

Table 2 shows the comparison between the average, decrease in depression pre-test and post-test scores in the intervention group and the control group of 0.000 (p-value <0.05). It means that there is a very significant influence of life writing therapy to decrease depression in adolescents (Table 2).

Table 1. Characteristics of respondents (n=40)

Variable	Intervention		Control		Total	
	f	%	f	%	f	%
Age						
16	0	0	1	5	1	2.5
17	12	60	15	75	27	67.5
18	8	40	4	20	12	30.0
Sex						
Boys	10	50	7	35	17	42.5
Girls	10	50	13	65	23	57.5
Class						
Science	19	95	12	60	31	77.5
Social	1	5	8	40	9	22.5

DISCUSSION

The research results show that most respondents from a total of 40 students were at age of 17, or 67.5%. Another study which had the same thing was a study conducted by Harijanto, Handayani, & Asmika (2008). It reported that the prevalence of the depression among the high school students based on the age was found at the age of 17. There are a lot of factors that can influence it as revealed by EL Kelly in Bahiyatun (2011). At the age of 16 to 18, teenagers are commonly spend their times studying at high school. In addition, they will experience a crucial transition period between adolescence and adulthood. During this period, the status of the individual is not clear and there are doubts about the roles that must be performed. They are not expected to be childish anymore, but also not expected to behave like adults.

The results also show that that the number of female students was higher than male students, 57.5% women and 42.5% males. What makes it different is because girls tend to keep their depressed moods and strengthen them, female self-image, especially in a more negative body image than males, females find more discrimination than males, and puberty occurs earlier in females (Santrock, 2014). Darmayanti (2008) concludes that there were differences in depression between adolescent girls and boys. Adolescent girls have depressive tendencies compared to adolescent boys.

The research results also show that the mean pre-test score in depression of the intervention group was 8.90, and the control group was 8.55. The ranges of depression levels based on the set score are 0-4 not depressed/normal depression, 5-9 mild depression, 10-14 moderate depression, 15-19 severe depression, 20-27 very severe depression. Seeing these results, it can be said that both groups experienced an average level of mild depression. The results of this study are consistent with the results of research conducted by Safitri (2013) and Harijanto (2008) who reported that the level of depression experienced by adolescents at most was mild depression.

Ardjana (2010) suggests that a person can be said to experience mild depression if he/she shows at least two of the main symptoms. In addition, there should be no severe symptoms, and the duration of the entire episode is about two weeks. The main symptoms felt are the atmospheres of feeling depressed throughout the day and losing interest and passion in almost all activities, fatigue and decreased activity.

The research results show that there is the influence of life writing therapy to decrease depression in adolescents. This hypothesis is proven by statistical tests using independent t-test results showing p-value of 0.000 (p-value <0.05). It means that the average decrease in depression pre-test and post-test scores in the intervention group is larger than in the control group. Therefore, it can be concluded that there is a very significant effect on the depression score between the group with life

Table 2. Differences in depression scores of pre and post life writing therapy

Groups	Mean		SD	P-value	CI 95%
	Pre-test	Post-test			
Intervention (n=20)	8.9	4.8	4.10 (3.46)	0.000	3.95 (2.0-5.9)
Control (n=20)	8.55	8.40	0.15 (2.50)		

writing therapy than the group without this treatment.

The measurements before taking the life writing therapy show that a mean decrease in depression score of the pre-test in the intervention group is 8.90 and the control group is 8.55. It means that both groups had a quite similar mean of depression score. The intervention of life writing therapy is not performed immediately after the measurements pre-test are limited due to the time of respondents. The intervention of life writing therapy took 4 weeks and 8 meetings.

Post-test was conducted on the last day of therapy and showed that a mean of depression score in the intervention group was 4.8 or at the level of the normal depression; while in the control group was 8.40 or at the level of mild depression. Therefore, both groups showed equally decreased mean of depression score. Since this study was included in the social studies, it is very difficult for researchers to control the daily activities of the subject and other variables that could affect the decrease in depression score either the intervention group or the control group, and it is one of the weaknesses in this study. In addition, the research results show that the mean of depression score in the pre-test of the intervention group decreased by 4.10; while, in the control group, it decreased by 0.15. It suggests that the decrease in the intervention group was higher than in the control group. Furthermore, the results show that there was a change in the level of depression for the intervention group in which the mild depression in the pre-test changed into normal depression in the post-test. Whereas, there was no difference in the control group between the depression levels in the pre-test and post-test scores. The results also show that the respondents stated that writing was fairly effective means to vent feelings, understand the situation of themselves and were able to identify a problem that was happening.

The results of this research are consistent with the results of research conducted by Susilowati and Hasanat (2011) which reported that there is a significant decrease in emotional experience after implementing life writing therapy for depression in the first year students. Furthermore, a study by Indah, Afiatin, & Astuti (2011) shows that there is significant emotional experience to reduce depression among women of violence victims. However, these results are against the results of research suggested by Murti and Hamidah (2012) finding that there is no significant effect of expressive writing on decreasing depression in adolescents in Vocational High Schools. They found that the control group also experienced a decrease in depression scores caused by giving treatment of writing daily activities.

Seligman in Maulida (2012) states that depression is an emotion that comes amid helplessness and failure of individuals, and when an individual attempting to gain unrealized power. One thing that can be done to let the emotions go is by writing. Qonitatin (2011) reports that expressive writing therapy of emotional experience has a significant impact as a catharsis or emotional release in lowering the level of mild depression.

Hawkins in Indah (2011) also mentions that the model of therapy-oriented catharsis, as is done in the intervention group with life writing or writing life, has the power to dramatically and automatically change the personality or alter the regulatory process accompanying personality changes. This model holds that a cathartic experience is achieved, and then there is an automatic process that transforms a person becomes better. Writing can integrate thoughts and feelings about experiences that are experienced so that they can see or analyze what really happened to themselves. Therefore, one can understand the existing problems and develop problem-solving strategies (Firdaus, 2015).

The process of writing therapy conducted in this research is to tell about their past, current, and future lives which are not only painful but also fun. Pennebaker in Hernowo (2016) suggests that the thoughts and feelings associated with the trauma force individuals to unite the many facets of the complex events that a person can digest complex thoughts into a unity that is more easily understood. Writing unpleasant emotional experience may also increase positive emotions temporarily.

Some topics that can be written in life writing therapy are about themselves, like who I am, the body, personal or family problems and their relationship with themselves, relationships with friends, loss of someone, change management, and mind building (Bolton, 2011). Besides, the topic is not only related to past experience but also the situations faced in the future and dreams (Susanti, 2013).

Murti (2012) states that the use positive words will lead positive cognitive at the end of the therapy; while the use of negative words in moderation (no more or less) storyline is clear and well-organized. Furthermore, the emerging outlook and positive expectations after writing therapy can help reduce depression. Therefore, life writing therapy can be

used as one of the interventions to help decrease depression.

Researchers realized that there are still a lot of shortcomings of this study that make this research is far from perfect. There are some limitations in this analysis. First, it is a social experiment research so that there are internal and external factors that cannot be controlled during the study. Second, the distance between pretest and intervention as well as the distance in each meeting to write the course made the respondents experienced a different atmosphere at each meeting and influenced the internal validity of the study.

Since there was no expert assistance in conducting the therapy, there was bias or manipulation during the research. During the meeting, therapy was conducted by taking over a counselling guidance class (60 minutes) and the time spent to write was 45 minutes. It was insufficient to devote about their lives, feelings and thoughts completely, although their writing in the second session could be continued at home. The writing therapy performed on a scheduled basis at certain times had the respondent should write about their lives on the condition whether they were interested or not.

This study can be one of effective therapies applied to the risk groups so that it can prevent depression in adolescents. This therapy can be done by anyone and anywhere since it is easy to apply. Besides, it can also be a learning material for nursing care especially in adolescent mental health and can be used as evidence for further research related to adolescent mental health by developing writing therapy both for individual or group of individuals.

CONCLUSION

Life writing therapy is proved to influence on decreasing depression in adolescents. It occurs because life writing therapy facilitates the subject to evaluate, analyze and reassess past, current, and future events so that the subjects get an understanding, develop a solution, have self-motivated, accept the existing situation, learn from what is experienced, focus thoughts on positive things, and assess the positive things of an event.

It is recommended that the next researchers who wants to conduct similar research should examine the internal and external factors that can influence depression in adolescents. Furthermore, the intervention was suggested to be carried out on the same day as the pre-test and intervention was not carried out by the researchers themselves to increase the accuracy of the results of the study. In addition, there is a need for additional time in writing therapy so that respondents can devote more about their feelings.

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Original Research

Exclusive Breastfeeding Associated with the Reduction of Acute Respiratory Tract Infections in Toddlers with High-Risk Factors

Abu Bakar[1], Elfira Fitria Rohma[1], Iqlima Dwi Kurnia[1] and Siti Nur Qomariah[2]

[1] Faculty of Nursing, Universitas Airlangga, Surabaya, East Java, Indonesia
[2] Faculty of Health Science, Universitas Gresik, East Java, Indonesia

ABSTRACT

Introduction: Acute respiratory tract infections (ARI) is a disease that is the primary cause of death, especially in children. Toddlers can be prevented from developing ARI with increased immunity. Giving breast milk can increase children's immunity, but there are still children who experience ARI. This study aimed to explain the differences in Acute Respiratory Tract Infections (ARI) events in toddlers who are exclusively and non-exclusively breastfed.

Methods: The research design used was descriptive-comparative with a retrospective design. The population in this study were all children one to three years of age. A sample of 158 toddlers was recruited by a purposive sampling technique. Data retrieval was done with the criteria that the child had visited a public health centre (puskesmas) or integrated health care service post (posyandu), and does not suffer from a disease such as asthma or have any allergies. The variables were measured using a questionnaire and observation sheet. Data analysis was done by a chi-square test and binary logistic regression.

Results: The results showed that there were differences in ARI incidence in toddlers (one to three years) who were exclusively and non-exclusively breastfed with a value of p = 0.003. The air pollution factor proved to be significant, dominantly affecting the incidence of ARI.

Conclusion: Differences in ARI incidence in toddlers who are exclusively and non-exclusively breastfed is possible due to air pollution factors. Key implications for nursing practice from this research are improving services, and prevent the occurrence of ARI.

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CONTACT

Abu Bakar
✉ abu.bakar@fkp.unair.ac.id
Faculty of Nursing, Universitas Airlangga, Surabaya, East Java, Indonesia

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INTRODUCTION

Acute Respiratory Tract Infection (ARI) is an infection that attacks the throat, nose, and lungs which occurs around fourteen days (Kemenkes RI, 2012) and becomes the main cause of death, especially in children around the world (Fillatre et al., 2018). Around 18-33% of the death of children under five years is estimated to be caused by ARI (Khan & Islam, 2017). In addition, 6.6 million children under five years old died in the world annually. As many as 95% occurred in developing countries, and one-third of which were caused by ARI (Tazinya et al., 2018).

Risk factors of ARI include the provision of breastmilk, the nutritional status of infants, birth weight, air pollution, immunization status, and population density (Kemenkes RI, 2012). Incomplete exclusive breastfeeding is one of the risk factors for ARI, especially in toddlers who are very susceptible to the infection. In other words, toddlers who are not exclusively breastfed have a high risk of ARI (Arifeen et al., 2001), while the risk can be reduced in those who are exclusively breastfed (Hanieh et al., 2015). In addition, patients with mild ARI (not pneumonia) can be worsened into severe if not treated properly (Qazi et al., 2015). Furthermore, ARI can be experienced several times by children as many as three to six times per year on average (Riskesdas, 2013).

The existence of a stimulus, in this case, the provision of breastmilk, will lead to the emergence of coping mechanisms in individuals. The regulator subsystem is part of a coping mechanism that has

several adaptive modes. Breast milk contains anti-bacterial factors including secretory Ig A, IgG, epithelial cell receptor analogues, casein, alpha-lactalbumin, lipids, and phosphorylated beta-casein (Andreas, Kampmann, & Mehring Le-Doare, 2015) which will help the children to response viruses or bacteria inhaled. The presence of these substances will result in a high content of anti-bacterial factors and will prevent the entry of viruses or bacteria entering the body, and subsequently, prevent the occurrence of ARI.

Previous research in Indonesia indicated that there was a relationship between the history of exclusive breastfeeding and the incidence of ARI in one-year-old children (Anggraeni & Warsiti, 2010). Another study was that the incidence of ARI was lower at the age of seven to twenty-four months who were given exclusive breastfeeding than those who were fed with formula milk (Dewi, 2017). Previous research conducted abroad showed that risk factors for age, sex, immunization status, breastfeeding, nutritional status, and population density were not significantly associated with ARI events (Tazinya et al., 2018). The results of previous studies in Indonesia showed that there was no research subjects toddler.

Based on previous research that does not have a toddler's age, a study will be conducted on the differences in ARI incidence in toddlers who are given exclusive and non-exclusive breastfeeding. The results of previous studies abroad showed that ARI risk factors were not significantly associated with ARI events. Based on those results, re-research needs to be done, especially in Indonesia due to differences in characteristics and culture.

Based on East Java's 2016 health profile data, the number of babies in the East Java region was 509,874 toddlers, 74.3% of these were exclusively breastfed. Whereas in the Lamongan area the number of toddlers was 18,542 with 73.3% of that number having been exclusively breastfed (Riskesdas, 2013). The results of a preliminary study of ten mothers who had toddlers found five children were exclusively breastfed and five children were non-exclusively breastfed. From the five children who were exclusively breastfed, four children rarely experienced ARI and one child often developed ARI (Rohma, 2018). Meanwhile, three out of five children who were non-exclusively breastfed often experienced the incidence of ARI and two children rarely experienced ARI events. The frequency category of ARI events in children is said to be rare if it occurs once in the last two months and often if it occurs twice or more than three times in the last two months (Kemenkes RI, 2012).

Based on data obtained from the 2016 East Java health profile, there were 102,712 cases of ARI in infants were found and treated. Preliminary study results at the health profile of Lamongan Regency 2016 recorded 5,372 toddlers of ARI cases that were found and handled. Lamongan was the highest of five regencies or cities that have ARI cases in East Java. According to the Public Health Office of Lamongan, in 2017, as many as 3,479 toddlers suffered from ARI and 223 toddlers suffered from severe pneumonia. In a district community health centre in Lamongan, from January to April 2018, there were 44 infants who suffered ARI pneumonia and severe pneumonia.

Therefore, based on the description above, researchers are interested to conduct investigations that can determine the difference in the incidence of ARI in toddlers who are exclusively and non-exclusively breastfed. Knowing these differences will eventually encourage mothers to exclusively breastfeed children to reduce the incidence of ARI. This research aimed to explain the differences in ARI events in toddlers (one to three years) who are exclusively and non-exclusively breastfed.

MATERIALS AND METHODS

The research design was descriptive-comparative with a retrospective approach looking at ARI events that had occurred in the past, namely toddler age.

The population of this study was all children one to three years old (toddlers) in Lamongan, Indonesia. The data was collected in a district which had a primary public health centre (puskesmas), and six health service posts (posyandu) as program implementers. The puskesmas noted that the number of children under five in April 2018 was 301 toddlers. A sample of 158 toddlers was recruited by purposive sampling technique. The technique was done by determining the sample based on predetermined criteria, namely toddlers who had visited a public health centre, and did not suffer from a disease such as asthma or have any allergies. The study was conducted from June 22 to July 9, 2018.

The procedure for data collection was carried out for the first time at a *puskesmas* in one of Lamongan's districts by assessing medical records of the toddlers who met the inclusion criteria for some information such as address, demographical characteristics, and incidence of ARI over the past two months. The ARI incidence data were used to determine categories.

Toddlers who met the criteria were visited at their home in which the researchers asked for permission to the children's parents to be involved as research subjects. The parents were explained with the purpose and procedure of the study and then asked for a signature as evidence of agreeing or disagreeing as for the subject of the study. Respondents who agreed to be the subjects were accompanied to fill out questionnaires about self-identity, exclusive breastfeeding, and air pollution. Room occupancy density data was taken by measuring the respondent's room area directly. Nutritional status data and immunization history were obtained from kartu menuju sehat (growth chart). The collected data were then analyzed and explained.

Research variables were breastfeeding, ARI incidence in toddlers and ARI risk factors. Variables

of ARI risk factors consisted of low birth weight (LBW), nutritional factors, air pollution, occupancy density, and complete immunization. The research instruments used were the ARI and ARI risk questionnaire which was modified from the research of Agungnisa (2017) and Simarmata (2017). In addition to questionnaires, there were variables measured by observation techniques, namely nutritional status by looking at the growth chart data, ARI occurrences were determined by assessing the medical records, and the occupancy density of the room was measured using a meter. The category of ARI events in children was divided into "rare", less than once in the last two months; and "often", more than twice in the last two months) (Kemenkes RI, 2012). Occupancy density categories were grouped into crowded, eight square meters for more than two people or less than four square meters for one person; and worthy, eight square meters for two people or more than four square meters for one person (Agungnisa, 2019).

This study used a Chi-square test with a significance of $\alpha \leq 0.05$ for the analysis of the hypothesis of the relationship between the incidence of ARI and breastfeeding. The relationship between ARI and the risk factors were analyzed using a binary logistic regression test.

The research procedure had been tested and declared ethical by the Health Research Ethics Committee of the Faculty of Nursing, Universitas Airlangga, on July 2nd, 2018 with an ethical approval number of 982-KEPK. The ethical principles applied in this study included participants who were given information and provided informed consent before the data collection. They had the right to confidentiality of data by using initials.

RESULTS

Out of 158 respondents, there were 76 toddlers who were not exclusively breastfed (Table 1). The majority of toddlers who are non-exclusively breastfed, often experience ARI (59.2%). In addition, the majority of toddlers who were exclusively breastfed rarely experienced ARI (64.6%), which means that an incidence of rare ARI was found.

To identify the relationship between the variable risk factors for ARI events and the main variable, namely the incidence of ARI, a series of initial analyses were carried out (Table 2). The proportion of underweight birth weight is in accordance with the standard, the majority of which was 135 (85.4%) of normal birth weight. Also, most of the nutritional status and immunization status are good (96.2% and 79.1% respectively), which means that toddlers' nutrition was fulfilled and the immunization was complete. Moreover, air pollution around the homes of toddlers with poor or unhealthy air pollution was 35.4%, while moderate air pollution was 45.6% and only 19% were healthy. In accordance with the standards imposed by the Indonesian government, more than half of toddlers (56.3%) experienced inadequate housing. LBW toddlers who are non-exclusively breastfed (47.8%) often experience ARI. Toddlers with good nutritional status and exclusive breastfeeding (32.9%) rarely experience ARI.

Toddlers with complete immunization status and exclusive breastfeeding (32.8%) rarely experience ARI. Toddlers who lived in unhealthy air pollution areas and were non-exclusively breastfed (66.1%) often experience ARI. Toddlers who lived in homes with worthy room and obtained exclusive breastfeeding (37.7%) rarely experience ARI. In particular, air pollution had the most dominant relationship to the incidence of ARI in toddler children. This is indicated by p-value = 0.000.

The results of this study indicate that there were differences in the incidence of ARI in toddlers who were exclusively and non-exclusively breastfed. The results of the Chi-square statistical test obtained a p-value of 0.003 which means that the first hypothesis (H1) is accepted if $p < 0.05$ (Table 1).

DISCUSSION

ARI events in the category are often lower for toddlers who are exclusively breastfed than for non-exclusive children. This is evidenced by the results of the data that most toddler who exclusively breastfed experienced ARI in the rare category; whereas most toddlers who were non-exclusively breastfed experienced ARI in the frequent category. The incidence of ARI is said to be rare if it occurs once in the last two months and often if it occurs twice or more than three times in the last two months (Kemenkes RI, 2012).

The results of this study were in line with previous studies which stated that there was a significant difference in the incidence of ARI between children who were exclusively breastfed and those who were given complimentary food for breast milk at the age of 7-24 months (Dewi, 2017). The difference in ARI incidence in children who were exclusively and non-exclusively breastfed is because breast milk contains anti-bacterial and anti-viral factors (Andreas et al., 2015). Breast milk also contains anti-inflammatory substances and anti-infective substances. The presence of these ingredients can prevent infectious diseases caused by bacteria, viruses, and parasites (Riksani, 2012).

Some studies also prove that breast milk can reduce the incidence of infections in infancy and toddlers such as gastroenteritis, respiratory infections, otitis media, neonatal sepsis and urinary tract (Aldy, Krupnick, Newell, Parry, & Pizer, 2009). Most toddlers who were exclusively breastfed experienced ARI in the rare category. It is evident that exclusive breastfeeding can reduce the risk of ARI in infants (Hanieh et al., 2015). As for toddlers who were given non-exclusive breastfeeding, most experienced ARI in the frequent category. It proves that ARI has a high risk in children who are not exclusively breastfed (Arifeen et al., 2001).

Table 1. The comparison of ARI occurrence in toddlers who were given exclusive and non-exclusive breastfeeding (N=158)

Breastfeeding	ARI		Total n (%)	Chi-Square Test p-value
	Often n (%)	Rare n (%)		
Non-exclusive	45 (59.2)	31 (40.8)	76 (100)	0.003
Exclusive	29 (35.4)	53 (64.6)	82 (100)	

Table 2. Risk factors of ARI in non-exclusively and exclusively breastfed toddlers (N=158)

Risk Factors	ARI Frequency	Non-exclusive breastfeeding		Exclusive breastfeeding		Total		P-value
		n	%	n	%	n	%	
Birth weight								
Low	Often	11	68.8	2	28.6	23	14.6	0.829
	Rarely	5	31.3	5	71.4			
Not Low	Often	34	56.7	27	36.0	135	85.4	
	Rarely	26	43.3	48	64.0			
Nutritional status								
Poor	Rarely	3	100.0	3	100.0	6	3.8	1.000
Good	Often	45	61.6	29	36.7	152	96.2	
	Rarely	28	38.4	50	63.3			
Immunization								
Less	Often	9	56.3	5	29.4	33	20.9	0.619
	Rarely	7	43.8	12	70.6			
Complete	Often	36	60.0	24	36.9	125	79.1	
	Rarely	24	40.0	41	63.1			
Air condition								
Poor	Often	37	97.4	16	88.9	56	35.4	0.000
	Rarely	1	2.6	2	11.1			
Fair	Often	5	20.0	11	23.4	72	45.6	
	Rarely	20	80.0	36	76.6			
Good	Often	3	23.1	2	11.8	30	19.0	
	Rarely	10	76.9	15	88.2			
Occupancy								
Crowded	Often	30	68.2	18	40.0	89	56.3	0.799
	Rarely	14	31.8	27	60.0			
Worthy	Often	15	46.9	11	29.7	69	43.7	
	Rarely	17	53.1	26	70.3			

According to the results of previous studies, the lack of breastfeeding could increase the likelihood of ARI and diarrhoea (Khan & Islam, 2017). These results were supported by previous findings, where children who have been formula milk-fed since babies had experienced severe respiratory diseases and required more than three hospitalizations compared to infants who were exclusively breastfed (Bachrach, Schwarz, & Bachrach, 2003). Morevover, Mihrshahi et al. (2007) stated that the increase in exclusive breastfeeding can reduce child morbidity and mortality and is essential to increase the survival rate of children. These results are similar to other studies which also confirm that exclusive and prolonged breastfeeding has the large protective benefit of morbidity (Quigley, Kelly, & Sacker, 2007).

This study also analyzed five risk factors for the occurrence of other ARIs which according to the Indonesian Ministry of Health was an essential element to control ARI (Kemenkes RI, 2012). The five risk factors include low birth weight, nutritional status, immunization status, air pollution, and occupancy density. The five factors had been tested using binary regression analysis and show that air pollution had a significantly associated with the incidence of ARI. This result was in line with a study of Kumar, Roy, & Suguna (2014) stating that there is a significant relationship between meeting clean air needs and the incidence of ARI in infants. It indicates that children who live in a good environment of low air pollution have a lower chance of suffering ARI compared to those who live with unhealthy air pollution.

Based on the Ministry of Health of the Republic of Indonesia, intensification carried out in the context of prevention and control of ARI includes a family approach (Kemenkes RI, 2012). The family approach that can be undertaken is through promotive and preventative methods. Promotive efforts include exclusive breastfeeding, balanced nutrition, reducing air pollution, coughing behaviour, and early detection. Preventive efforts include immunization

which comprises diphtheria pertussis tetanus (DPT), measles, Hepatitis, and tuberculosis (Kemenkes RI, 2012). Based on the results of previous studies, prevention of ARI can be accomplished by improving maternal self-efficacy including educating mothers about the concept of ARI, ARI conventional treatment, environmental modification, the benefits of using masks, clean and healthy behavior, proper hand washing, nutrition, the provision of exclusive breast milk, stress management, making peer support groups for mothers of toddlers, and optimizing the role of health workers and family support (Zatihulwani, Sukartini, & Krisnana, 2017).

The air pollution observed in the study was due to the presence of family members smoking, the use of fuelwood stoves, burning garbage, the use of mosquito repellent, houses closed to animal pens and the type of floor of the house. The researcher found that most children lived with families who had smoking behaviour. In these environments, most ARI events often occurred. These results were in line with a study which stated that secondhand smoke is a significant risk factor for ARI (Tazinya et al., 2018). Cigarette smoke is also strongly associated with the incidence of ARI in infants (Kumar et al., 2014). Exposure to cigarette smoke, especially at home and from family members, will increase the likelihood of ARI cases. This result was consistent with the study of Efni, Machmud, & Pertiwi (2016) explaining that the exposure to cigarette smoke in the home has a relationship with the incidence of pneumonia in infants.

LBW, immunization status, nutritional status, and room occupancy density were factors that did not significantly influence the incidence of ARI in toddlers who were exclusively and non-exclusively breastfed. This result was in line with previous research which stated that immunization status and nutritional status did not affect exclusive breastfeeding with the incidence of ARI (Prameswari, 2009). Another study also stated that nutritional status was not significantly associated with ARI events (Tazinya et al., 2018). It can, therefore, be concluded that from some confounding factors, air pollution is an element that significantly influences the incidence of ARI in an exclusive and non-exclusive toddler who were breastfed.

CONCLUSION

There are differences in ARI events in toddlers who are exclusively and non-exclusively breastfed. Toddlers who are given exclusively breastfed rarely experience ARI than toddlers who are non-exclusively breastfed. ARI occurences in toddlers are also influenced by air pollution factor, especially in those who are not exclusively breasfed. The recommendation for further research is the relationship between the habits of parents of smokers and ARI in infants who are exclusively and non-exclusively breastfed.

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Original Research

Factors Associated with Nurses' Self-Efficacy in Applying Palliative Care in Intensive Care Unit

Theresia Avila Kurnia[1], Yanny Trisyani[2] and Ayu Prawesti[2]

[1] Diploma of Nursing Programme, Poltekkes Kemenkes Kupang, East Nusa Tenggara, Indonesia
[2] Faculty of Nursing, Universitas Padjadjaran, Bandung, West Java, Indonesia

ABSTRACT

Introduction: The increasing need for palliative care (PC) in the intensive care unit (ICU) is characterised by an increasing number of patients with critical and terminals conditions. It requires comprehensive treatment of nurses, through PC. Self-efficacy is a major predictor that affects the application of PC in ICU. Therefore, nurses need to have high self-efficacy to provide quality PC for patients and their families. This study aimed to analyse the factors that dominant relates to nurses' self-efficacy in implementing of providing PC in ICU.

Methods: This research was correlational research with cross-sectional survey design. The sampling technique used was total sampling, which involved 127 critical nurses who were actively working at a general hospital in Bandung, Indonesia. Data were collected using questionnaires. Bivariate analysis using Pearson correlation and Rank-Spearman test and multivariate analysis using linear regression.

Results: The results showed that the majority of respondents had high self-efficacy, working experience >15 years, enough interest to the nursing profession had less knowledge and negative perception related to the PC in ICU. There was a significant relationship between self-efficacy with work experience, nurses' interest in the nursing profession, knowledge and perception variables. The most dominant factors related to self-efficacy, namely knowledge and perceptions of nurses related to PC.

Conclusion: This study indicates that majority of the respondents lacked knowledge and had negative perceptions related to PC in ICU, it is necessary to socialise and training related to it by focusing on self-belief or self-efficacy of nurses on their ability.

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CONTACT

Theresia Avila Kurnia
✉ theresia16003@mail.unpad.ac.id
Diploma of Nursing Programme, Poltekkes Kemenkes Kupang, East Nusa Tenggara, Indonesia

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INTRODUCTION

Palliative Care (PC) is primarily comprehensive care given to patients with life-threatening or life-limiting diseases (Shreves, 2014). The increasing need for PC arose since the introduction of the importance of this program in the health care area in the United States (US). There was an increase of up to 125% from 2000-2008 (Urden, Stacy & Lough, 2014). PC is not only given in community settings but also given in the care of inpatient services in hospitals, such as medical ward and even the intensive care unit (ICU) (Payne, Seymour & Ingleton, 2008).

ICU is a treatment area which is full of various sophisticated technological innovation tools aiming to extend the lives of patients with critical conditions (Cox, Handy & Blay, 2012). This critical patient condition often causes pain that is not recognized or treated, shortness of breath, delirium, fatigue, lack of appetite, drowsiness, dyspnea, anxiety, depressive mood and weakness, constipation, tightness, nausea and vomiting, fever and infection, edema, anxiety, delirium, and metabolic disorders (Ayasrah, O'Neill,

Abdalrahim, Sutary & Kharabsheh, 2014; Wilkie & Ezenwa, 2012; Delgado-Guay, Parsons, Li, Palmer & Bruera, 2009; National Clinical Effectiveness Committee, 2015; Nelson, Mulkerin, Adams & Pronovost, 2006; Urden, Stacy & Lough, 2014).

The PC provided in ICU contributes positively to the patient, family and clinician team (Aslakson, Curtis & Nelson, 2014). In providing high-quality and effective PC in ICU, nurses play a strategic role for being the primary liaison between patients, families and other members of the multi-professional team. However, professional nurses nowadays may not always be ready to provide qualified PC for patients and families (Fitch, Fliedner, & O'Connor, 2015; World Health Organization/WHO, 2018).

Self-efficacy is an internal factor that greatly influences nurses in implementing PC (Gaffney, 2015). This is supported by the statements of Lenz & Shortridge (2002), that self-efficacy is the most important predictor in influencing changes in individual behavior and providing satisfactory results. It is also a predictor that influences nurses in providing quality PC (Ferrel, Coyle & Paice, 2015). Self-efficacy is someone's belief in his/her ability to do something to achieve his/her goals (Bandura, 2005). Within the context of nursing, self-efficacy is an important aspect that supports nurses' skill performance (Tyler, Bourbon, Cox, Day, Fineran, Rexford, & Ward-Smith, 2012). Nurses' self-efficacy correlates with professional autonomy and empowerment. Nurses with high self-efficacy perceive obstacles as opportunities instead of threats (Manoilovich, 2005). High self-efficacy also influences the quality of clinical performance which later leads to the satisfactory outcome of patients (Joy, 2015).

According to Gaffney (2015), the current phenomenon happened is that nurses' self-efficacy is not balanced. Some nurses have low self-efficacy while some others have high self-efficacy. This problem relates to several factors, among others: age, gender, knowledge, perception, and experience (Bandura, 2004). Soudagar, et al (2015) added that other factors affect the self-efficacy of nurses, namely interest to the nursing profession.

Research shows that there are still many nurses who have never received information regarding PC and have a low knowledge score related to PC (Al Qadire, 2014; Ayed, Ahmad, Sayej, Harazneh, Fashafsheh & Eqtait, 2015; Kalogeropoulou, Maria, Evanthia, Petros & Dimitris, 2016; Agustina, Anna and Praptiwi, 2014). This shows that there are still nurses who have not been exposed to information related to PC, thus affecting the knowledge they have. In addition, Johnston and Lorraine (2006) state that nurses' perceptions of PC currently vary, which is only given to patients with severe illness and who are dying or patients nearing death, especially for cancer patients, care to relieve pain and aggravating symptoms at the end of life (Rodriguez, Barnato & Arnold, 2007; Sarfo, et al, 2016). These perceptual differences about the PC referral process result in a lack of utilisation of palliative services and can result in a decrease in nurses' self-efficacy in achieving the goals to be carried out (Rodriguez, et al., 2007; Gaffney, 2015).

Individual self-efficacy is also influenced by the experience of the individual, which is formed through a process of adaptation and learning that recurs in the situation. The longer the individual is in the situation, the more self-efficacy they have will be improved or high (Bandura, 2004). Successful experiences experienced by individuals can increase their self-confidence and self-efficacy. On the other hand, experiences of failures that have been experienced can reduce individual self-efficacy (Zulkosky, 2009). Interest is a situation where individuals have special attention to something and have the desire to know and learn more (Darmadi, 2017). The higher the individual has an interest in something, the higher the self-efficacy he has. High individual self-efficacy is an important predictor of how individuals behave towards choices to be made, mindset, emotional reactions, motivations, and ways of acting (Soudagar, 2015). Lack of interest into the nursing profession, working experiences, knowledge and differences in perceptions experienced by nurses as described previously can influence nurses' self-efficacy in implementing PC. This study aimed to analyse the factors that dominant relates to nurses' self-efficacy in implementing of providing PC in the ICU.

MATERIALS AND METHODS

This research was quantitative research which used descriptive analytic study with cross-sectional survey design. The location of the study was in the ICU of the General Hospital in Bandung. The study was conducted for one month, May to June 2018. The sampling technique used in the study was a non-probability sampling technique, namely total sampling. There were 127 actively working nurses involved in this research.

This study employed four questionnaires, namely demographic questionnaire, knowledge questionnaire, perception questionnaire and nurse self-efficacy in the application of intensive palliative questionnaire. Questionnaire on respondents' characteristics contained age, sex, ICU, religion, recent education, ethnicity and palliative education activities, working experiences and level of interest to the nursing profession. Standardised questionnaires were employed in this research, among others on knowledge questionnaire proposed by Nakazawa, Miyashita, Morita, Umeda, Oyagi, & Ogaswara (2009), on perception proposed by White & Coyne (2011) and the one on self-efficacy designed by Desbiens, et al. (2011). A survey questionnaire namely Palliative Care Knowledge Test (PCKT) which contained 18 statements with choices of right, wrong, and unsure answers. This questionnaire had been adjusted to the WHO palliative definition (2014) by Nakazawa. This knowledge questionnaire consisted of some conceptual content about the philosophy and principles of PC (2 items), pain and other symptoms

management (symptoms of pain: 6 items, dyspnea: 3 items, gastrointestinal: 4 items) and aspects psychosocial (3 items) (Nakazawa, et al., 2009). Palliative Care Practice of Registered Nurses (PCPCRN) questionnaire proposed by White and Coyne since 1999 was employed to collect data on nurses' perception about PC. This instrument consisted of some questions which were categorised into two parts based on the level of importance of PC (10 domains) and the level of individuals' competence in performing PC (10 domains) (White, Roczen, Coyne, & Wiencek, 2014). Nurses' self-efficacy was measured using a survey questionnaire namely Palliative Care Nursing Self-Competence Scale (PCNSC) questionnaire developed by Desbiens & Fillion since 2011. In this research, surveys were conducted to measure nurses' self-efficacy based on ten categories or ten PC dimensions which included physical needs: pain (5 items), physical needs: other symptoms (5 items), psychological needs (5 items), social needs (5 items), spiritual needs (5 items), needs related to patients' functional status (5 items), ethical and legal issues (5 items), inter-professional collaboration and communication (5 items), personal and professional issues related to nursing care (5 items) and end-of-life care (5 items) (Desbiens, Gagnon, & Fillion, 2012).

The results of the measurement of knowledge were then analysed using the percentage score, with a score range of 0-100%. The percentage results were then categorised as follows the category of low (score> 56%), enough (score 56-75%), and good (score 76-100%) (Nursalam, 2011). The results of measurement on perception and self-efficacy were then analyzed using T score using this following formula (Azwar, 2010). The score obtained from the test were then categorised into these following categories: positive perception or high efficacy = if T score ≥ mean score, whereas, negative perception or low efficacy = if T score is lesser than the mean T score. The researcher categorised the variables to make it easier to describe the results of research based on those categories, which results were not to be analysed.

The researcher did a back translation and retested the validity and reliability of the questionnaire on 42 intensive nurses using Pearson product moment correlation for validity and KR-20 and Alpha Cronbach for reliability. One item on the knowledge questionnaire was not valid and all items on the perception and self-efficacy questionnaire were valid. The PCKT, PCPCRN and PCNSC questionnaire were reliability because the reliability coefficient value was greater than 0.7 (KR-20 = 0.718 for knowledge, Alpha Cronbach = 0.841 for perception about importance of PC, Alpha Cronbach = 0.888 for perception about individuals' competence in performing PC, Alpha Cronbach = 0.908 for physical needs: pain, Alpha Cronbach = 0.948 for physical needs: other symptoms, Alpha Cronbach = 0.873 for psychological needs, Alpha Cronbach = 0.913 for social needs, Alpha Cronbach = 0.889 for spiritual needs, Alpha Cronbach = 0.903 for needs related to patients' functional status, Alpha Cronbach = 0.927 for ethical and legal issues, Alpha Cronbach = 0.952 for interprofessional collaboration and communication, Alpha Cronbach = 0.959 for personal and professional issues related to nursing care and Alpha Cronbach = 0.930 for end-of-life care).

Univariate analysis was used to determine the frequency of each variable. For bivariate test analysis, Rank Spearman test was used if the data were not normally distributed while the Pearson correlation test was used if the data were normally distributed. Before collecting data, the researcher conducted ethical clearance from the Ethics Committee of Hasan Sadikin General Hospital (RSUP) Bandung on March 29, 2018 number: 1193/UN6.L6/LT/2018.

RESULTS

Based on the results of the statistical analysis in Table 1, the data on respondents' characteristics showed that the majority of respondents were female (73.2%), came from the General ICU (GICU) treatment room (57.5%), had the last education of diploma's degree in nursing (D3) (62.2%) and had not attended education related to PC (75.6%). Also, almost all respondents aged 26-45 years (86.6%), were Muslim (97.6%) and were Sundanese (76.4%).

Based on the results of data analysis in Table 2, most respondents had high self-efficacy (56.7%), working experience >15 years (36.2%), enough interest to the nursing profession (50.4%), lack of knowledge (81.1%) and had negative perceptions (52%) related to the practice of PC in ICU.

Based on the results of data analysis in Table 3, the significance value was α = <0.05 in all variables, working experiences (p = 0.014), interest to nursing profession (p = 0.017), knowledge (p = 0.000) and perception variable (p = 0.000). It showed that the research hypothesis was accepted. This showed that there was a correlation between nurses' working experiences, interest to the nursing profession, knowledge, perception and self-efficacy variables in implementing of providing PC in ICU in a general hospital in Bandung.

The result of linear regression analysis (Table 4) shows that perception and knowledge are the variables that were dominant related factors to nurses'self-efficacy in implementing of providing PC in ICU, meaning each increase of one unit of knowledge, giving self-efficacy improvement and every increase of one unit of perception, giving self-efficacy improvement. The coefficient of determination R^2 = 0.363, it means that total of efficacy variability which can be explained by knowledge and nurse perception variable equal to 36.3%.

Table 1 Characteristics of ICU Nurses in General Hospital in Bandung

Characteristics	n = 127	
	Frequency	%
Age (years)		
17-25	3	2.4
26 - 35	52	40.9
36-45	58	45.7
46 - 55	12	9.4
56 - 65	2	1.6
Gender		
Male	34	26.8
Female	93	73.2
ICU		
CICU (Cardiac ICU)	20	15.7
GICU (General ICU)	73	57.5
NICU (Neonatal ICU)	19	15.0
PICU (Pediatric ICU)	15	11.8
Religion		
Islam	124	97.6
Non – Islam	3	2.4
Last education		
Diploma's Degree (D3)	79	62.2
Bachelor's Degree (S1)	45	35.4
Master's Degree (S2)	3	2.4
Ethnicity		
Sunda	97	76.4
Java	19	15.0
Others	11	8.7
Palliative Education		
Never joined any	96	75.6
Non-formal education	20	15.7
Formal education	2	1.6
Formal and Non-Formal Education	9	7.1

DISCUSSION

The Relationship between Work experience and Self-Efficacy in the Application of PC

Based on table 3, it shows that nurses' work experience in nursing has a significant relationship with self-efficacy in applying PC in ICU (p-value = 0.014). This is supported by research data which shows that most respondents (65%) who have a high level of self-efficacy and over 15 years of work experience, compared to respondents with less than five years of work. The results of this study are in accordance with the results of research conducted by Soudagar (2015), where his research showed a relationship between nurse experience with self-efficacy (p-value = 0.01) in working in the field of nursing. Respondents with >six years or more experience have higher self-efficacy score when compared with respondents with less than or five years of experience in the nursing field.

Bandura (2004) in his theory suggests that individual self-efficacy is influenced by experience, which is formed through a process of repeated adaptation and learning in these situations. The longer an individual is in the situation, the better his self-efficacy will be. Also, the experience of personal expertise possessed in the face of failure will result in satisfactory performance (Bandura, 2004).

Nurses' Interest Relation to Nursing Professions with Self-Efficacy Application of PC

There is a relationship between the nurse's interest in the nursing profession with self-efficacy in implementing PC in the ICU (p-value = 0.017) (Table 3). Respondents with low interest tend to occur in individuals with low self-efficacy, and individuals who have a good enough interest in the nursing profession will have good self-efficacy against palliative management in patients in the ICU. Research data support this data that individuals with high interest are more likely to have high self-efficacy (47.1%), whereas individuals with slightly more interest tend to have low self-efficacy (12.7%).

The results of this study are following the opinion of Soudagar (2015), stating that increased willingness or interest to work in the nursing unit can lead to good or high self-efficacy. This high self-efficacy can affect how someone thinks, feels, motivates, and acts. Individual self-confidence in their ability to perform certain behaviors is an important predictor of how they behave toward choice behavior, mindset, and emotional reactions. The statement is evidenced

Table 2. Frequency Distribution of Nurses' Work Experience, Interest to Nursing Profession, Knowledge, Perception and Self-Efficacy Variables in Implementing of Providing PC in ICU (n = 127)

No.	Variable	Frequency	%
1.	**Self-efficacy**		
	Low	55	43.3
	High	72	56.7
2.	**Working experiences (in years)**		
	<5	12	9.4
	6-10	33	26
	11-15	36	28.3
	>15	46	36.2
3.	**Interest to the nursing profession**		
	Little	11	8.7
	Enough	64	50.4
	Very	52	40.9
4.	**Nurses' knowledge (%)**		
	Lack	103	81.1
	Fair/enough	24	18.9
5.	**Nurses' perception**		
	Negative	66	52
	Positive	61	48

Table 3. Bivariate Analysis of Dependent and Independent Variables of ICU Nurses (n = 127)

Independent Variable	Mean ± SD	Min – Max	Self-Efficacy
			p-value
Work experience (years)	14 ± 7	1 – 34	0.014*[a]
Nurses' interest in to nursing profession	2,8 ± 0,9	1 – 3.8	0.017*[a]
Nurses' knowledge (%)	39 ± 15	6 – 71	0.000*[a]
Nurses' perception	44 ± 7	27 – 60	0.000*[b]

*Description: Analysis was used a: [a] Rank Spearman test and [b] Pearson correlation test, *the significance value was α = <0.05

through his research where obtained data showed that individuals who have an interest in the field of nursing have high self-efficacy.

Knowledge Relationship with Self-Efficacy in the Application of PC

The result of bivariate analysis based on table 3 shows the correlation between respondent knowledge to self-efficacy in applying PC in ICU (p-value = 0.000). This is supported by the results of research showing that individuals with inadequate knowledge, have low efficacy (81.8%). Otherwise, individuals with sufficient knowledge, have high self-efficacy (19.4%). The results of this study are in accordance with the results of research conducted by Nakhaei & Mofrad (2015) which shows the relationship between nurse knowledge with self-efficacy of nurses in applying infection control principle in the operating room (p = 0.033). Also supported by the assertion Aslesoleymani (2009), that knowledge and self-efficacy are closely related, where the more knowledge the individual has, the higher the self-efficacy he has, the better the behavior will be shown by the individual.

Bandura (2004) also revealed that knowledge is the primary substance of self-efficacy. Knowledge owned by individuals can change beliefs about the ability of individuals in achieving the desired goals, this can positively affect the behavioral changes and motivation in displaying the desired behavior. So, in conclusion, knowledge affects individual self-efficacy (Hossenialhashemi, 2014).

Perception Relationships with Self-Efficacy Application of PC

The results of the bivariate analysis showed that there is a positive correlation between perceptions of respondents about PC practice with self-efficacy in applying PC in ICU (p-value = 0.000). This is supported by research data indicating that most respondents who have positive perception, have high self-efficacy (62.5%). It is also supported that most respondents realised the importance of supporting and resource assessment (51.2%) as well as sensitive care for patients and families (53.5%), important enough to be implemented.

The results of this study in accordance with the opinion of Sunaryo (2004) which states that perception is the final process of observation, in which individuals will recognise and understand the condition of the surrounding environment (external perception) as well as the condition within themselves (internal perception). Eventually, the perception affects one's self-efficacy in determining the objective of specific action to do (Sunaryo, 2004; Bandura, 2004).

Table 4. Multivariate Analysis of the Dominant Related Factors with Nurses' Self-Efficacy in Implementing of Providing PC in ICU

		Unstandardized Coefficients		Standardized Coefficients	p value	R^2
		B	Std. Error	Beta		
Step 1	(Constant)	32.042	15.620		0.042	0.363
	Nurses' knowledge	0.586	0.141	0.304	0.000	
	Nurses' perception	1.954	0.319	0.458	0.000	
	Working experience	-0.053	0.290	-0.013	0.856	
	Nurses' interest	2.986	2.480	0.089	0.231	
Step 2	(Constant)	30.953	14.372		0.033	
	Nurses' knowledge	0.583	0.140	0.302	0.000	
	Nurses' perception	1.963	0.314	0.460	0.000	
	Nurses' interest	3.009	2.467	0.090	0.225	
Step 3	(Constant)	34.798	14.050		0.015	
	Nurses' knowledge	0.606	0.139	0.314	0.000	
	Nurses' perception	2.047	0.307	0.479	0.000	

Factors Most Associated with Self-Efficacy Application of PC

The results of linear regression analysis showed that the factors that dominant contributed to the self-efficacy of nurses in applying PC in the ICU were the perception and the knowledge factor of the nurses related to PC practice with the ability to explain the self-efficacy of 36.3%. The linear regression equation obtained in this study is self-efficacy = 34.798 + 0.606 x knowledge + 2.047 x perception.

The results of this study in accordance with the theory of Bandura (2004) which states that knowledge is the basic substance of self-efficacy. Through the knowledge they have, the individual will believe in the capabilities they have. Johnston & Lorraine (2006) adds that the nurses' perception of PC is a major predictor for individuals in believing their abilities. It can support behavioral changes and improve therapeutic relationships between nurses and patients. Positive perceptions of nurse respondents related to PC, supported by respondents' statements through data in the analysis of the study table show that almost all respondents (76.4%) mentioned that it is essential for nurses to get education related PC. Through the education gained, the individual can know, interpret, and live to it, then interpret it (through perception) (Sunaryo, 2004).

The results of this study differ from the results of research Soudagar (2015), where the interest factor of nurses to the nursing profession and work experience is a predictor in affecting self-efficacy nurse with p-value = 0.000 in multiple regression analysis tests. This shows that the factors of knowledge and perceptions of respondents in the study are stronger than other factors. Knowledge of the individual, through the thinking process, will be transformed into perception. Where perception is the terminology or the final process that stimulation can come from within and even outside the individual.

Nurses' perceptions of PC currently vary. Research conducted by Rodriguez, et al. (2007) support this statement, where there are still many nurses who think that PC is only given to patients with severe and dying conditions, especially in cancer patients only, treatments to relieve pain and symptoms which incriminates at the end of life (Rodriguez, et al., 2007). This perceptual difference inhibits the PC referral process and results in a lack of PC (Rodriguez, et al., 2007), and may result in a decrease in self-efficacy of nurses in achieving the objectives (Gaffney, 2015). Therefore, efforts need to be made to address this gap, namely the importance of identifying and adapting the nursing education curriculum, continuing education programs, and adding resources within the practice environment (White, Roczen, Coyne, & Wiencek, 2014).

CONCLUSION

The researchers concluded that the majority of nurses have high self-efficacy in applying all domains of PC in ICU. The high level of self-efficacy of the nurses in applying PC is related to the factors of working experience, nurses' interest into the nursing profession, nurses' knowledge and perception related to PC practice. Factors of knowledge and perception are dominant factors that have a relationship with self-efficacy of nurses in applying PC in ICU. This study indicated that there were still many nurses who had insufficient knowledge related to symptom management and psychosocial aspects and negative perceptions related to competence in implementing PC in the ICU. It was due to the lack of information and training related to PC. Therefore, it was important for the hospital to provide socialization and training related to PC in the ICU for all intensive nurses.

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Original Research

The Validity and Reliability of Quality of Nursing Work Life Instrument for Hospital Nurses

Utami Utami[1,4], Hari Kusnanto[2], Bagus Riyono[3] and Syahirul Alim[2]

[1] Doctoral Candidate of Public Health Programme, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia
[2] Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia
[3] Faculty of Psychology, Universitas Gadjah Mada, Yogyakarta, Indonesia
[4] Department of Nursing, STIKES ABI Surabaya, East Java, Indonesia

ABSTRACT

Introduction: The validity and reliability of the quality of nursing work life (QNWL) instrument in hospitals that suitable to treatment needs include: trust, care, respect, learn, and contribute need, have to be assessed. Therefore, in order to perform good care, it is necessary to notice QNWL aspect, which the implementation may be assessed by using valid and reliable instruments. This study aimed to evaluate the construct validity of the QNWL scale in hospital.

Methods: The research used a cross-sectional approach and the respondents were 100 experts in nursing and 400 nurses working in four hospitals in Gresik, Indonesia, who have been working for minimum one year. The sampling technique was purposive sampling. We analyzed the data using content analysis, the validity of item discrimination using Pearson products moment, reliability with Cronbach's alpha, and construct validity with Confirmatory Factor Analysis.

Results: The results based on content validity index QNWL instrument was 0.2075-0.915, with an average 0.7059 (high). Item discrimination capacity was 0.339-0.79 (high), while the reliability was 0.9374 (very high) and the validity of the construct meets the goodness of fit criteria.

Conclusion: All constructs are able to explain and support the QNWL instrument model. This research can be used to measure the quality of work life of nurses in all classes of hospitals in Indonesia.

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Validity; reliability; quality of nursing work life; instrument; hospital

CONTACT

Utami Utami
✉ tami_ola@yahoo.com
Doctoral Candidate of Public Health Programme, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia

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INTRODUCTION

Quality of nursing work life (QNWL) is described as strength as well as motivating and increasing employee productivity at work environment in the organization. Quality of nursing work life is a sustainable management approach directed for improving the quality of work, (Hamim Nur, et al, 2015). Quality of Nursing Work Life (QNWL) serves as a predictor of a nurse's intent to leave and a hospital nurse turnover, Since QNWL can be influenced by various factors, scholars and organizations have serious attention on how to scientifically assess the work conditions and mental statuses of nurses, (Fu et al., 2015). QNWL is needed in the work environment at the hospital.

Through human resource management approach, the hospital must be able to create QNWL that can provide opportunities for self-development, which are welfare covering workers' basic needs as well as a safe and comfortable work environment, in order to generate work morale as an effort to achieve goals

better. Quality means the ability to produce goods or services, marketed and to provide services constantly based on costumers' needs. That way, the goods or services produced are able to compete and to succeed in seizing the market. QNWL instrument is basically looking for ways to improve the quality of life and to create better work results or to achieve high performance (Kheradman, E, et al).

However, QNWL measurement tools that have been validated for the implementation in Indonesia have not been sufficient yet. Past research indicates that Quality Work Life is negatively associated with job stress (Mosadeghrad, et al 2011; Bragard, et al, 2012), turnover intention (Mosadeghrad et al., 2011 and Almalki, et al, 2012), and depression symptoms (Wang, 2009), and positively related to productivity (Nayeri, et al, 2011) and patient safety (Mitchell JI, 2012).

Quality of nursing work life is a management approach that is continuously directed for improving the quality of work. Thus, hospital management should care about the condition of its nurses in order to increase their loyalty to give better service which will ultimately improve employee performance. Overall, the best quality of care provided by the nurse is influenced by QNWL, which is an important element in health care services, (Clarke & Brooks, 2010). The preliminary study found that the number of nurses was around 60% of the total hospital employees. In terms of intensity of interaction with patients, the nurse is also an element of human resources with the highest intensity of interaction with the patient. Therefore, the quality of nursing work life (QNWL) instrument, especially in a hospital, need to be prepared based on the nurses' needs of QNWL.

It aims to achieve an effective work environment that brings the needs and values of the organization to the employee's personal need and value. QNWL also emphasizes the feeling perceived from the interaction between individual and work environment (Mohamad M and Mohamed W.N, 2012). Effective and efficient services can be measured based on two aspects, namely the service process aspect and service output aspect. In the process aspect, the parameter can be known from the service process in general (for example, the service of the implementation and documentation of nursing care). If the service process aspect in a hospital is not good, it will result in low service performance (for example, a low Bed Occupancy Ratio and incomplete filling of care document) (Soejadi, 2010).

Research related to QNWL is important to determine the quality of nursing work life in every hospital. Each hospital has different organizational systems and environments, so QNWL for their employee is different as well. This difference can be related to the state of the unit, the number and type of units, policies, and the environment in each unit (Nursalam, et al, 2018). A better understanding of QNWL is fundamental to specific strategies to improve QNWL and organizational productivity.

The effectiveness of specific strategies, including nurses' participation in making a decision, removing non-nursing tasks, and building healthy environments, could be evaluated using this instrument. The greater achievement of QNWL may increase nurses' job satisfaction and improve patient care as well as organizational productivity (Fu et al., 2015). Thus, it can be concluded that a valid and reliable quality of work life instrument can be used to assess organizational culture, which is oriented to a balance between productivity and employee welfare. In addition, welfare is defined as subjective wellbeing that has psychological dimensions such as trust, care, and mutual respect. Meanwhile, productivity also includes attitude and behaviour that support the achievement of optimal work outcomes, namely the willingness to learn and the commitment to contribute. Accordingly, this study aims to evaluate the constructed validity of QNWL scale in a hospital.

MATERIALS AND METHODS

This study was a descriptive research study using a cross-sectional design. This research was conducted in five stages namely, first, preparing an initial draft of the instrument by determining the instrument's blueprint. Based on the blueprint, we compiled a statement in accordance with the type of instrument and the amount specified in the blueprint; second, getting an assessment from the experts who at least had educational background of a master or a professional experienced in the scale of design in the fields of public health, clinical nursing, clinical care to generate a revised version; third, revising the draft instrument; fourth, performing the first and the second stage of testing; and, five, compiling the final draft.

The number of respondents involved in this study was 100 experts in nursing, 50 nurses for the early stage of testing instrument, and 350 nurses for the final stages of the testing instrument. Inclusion criteria were nurses working in a public hospital for at least one year in Gresik, East Java, Indonesia, and nurses who agreed to participate in the present study and who were not on vacation. The adaptation of a scale into a different culture requires a group of at least 5–10 times greater than the number of scale items, (Bryne, 2009). The desired minimum sample size required was 175 participants based on 35 items. Without selecting a sample group for the study, the data was collected using questionnaires from a total of 350 nurses who agreed to participate in the study.

QNWL questionnaire was developed by Riyono (2012). Therefore, the QNWL measurement instrument to be developed can be aligned with Minnesota Satisfaction Questionnaire (MSQ) and Job Diagnostic Survey (JDS) as the standard organizational diagnostic tool, that became the parameters including psychological dimensions such as trust, care, respect, learn, and contribution. The sampling technique was purposive sampling. The QNWL developed by Riyono (2012) was to determine

the quality of nursing work life. The scale consisted of 35 items and five subscales (trust, care, respect, learn, and contribution). Each item in the original scale was scored by a 5-point Likert scale ranging from "completely disagree (1 point)" and "completely agree (5 points)". The 35 items were reverse coded on the scale. The minimum total score was 35 and the maximum was 175. Higher total score indicated better quality of work life.

This research had gone through a process of ethical feasibility research and had been approved by the Medical and Research Ethics Committee of Faculty of Medicine, Universitas Gadjah Mada number KE/FK /0168/EC/ 2017.

RESULTS

In the initial stage, there were 50 items in the QNWL instrument. The initial test aimed to determine the item discrimination power, face validity. This test involved 50 nurses as respondents. The content validity index (CVI) of the QNWL instrument was range from 0.2075 to 0.915 with an average score of 0.7059 (high) according to expert judgment based on the Aiken V formula validity score, (Aiken, 2014).

Based on Table 2, we found that 52% of items were very high, 18% criteria were high, 10% criteria were fair and 20% criteria were low, according to expert judgment. Item number 4, 6, 7, 10, 18, 19, 20, 26, 27, 32, 37, 48, 44, 45, and 46 Aiken V formula validity scores less than 0.7 so that the items were considered invalid and not can be used again for measuring the QNWL indicator. After deducting the number of invalid statements, the number of items reduced to 35 statements. The item discrimination test results in the initial stage trial using Pearson product moment correlation obtained a validity score (*r count*) in the range 0.33 9 - 0.79 for 50 instrument items, while the *r table* was 0.279, so that items with r count were more the size of the r table, which means this validity score was sufficient reason to state that this QNWL instrument was valid.

Test construct validity with factor analysis using the R program, the data included in the factor analysis were the five QNWL constructs containing 13 indicators and 35 item statements. Factor analysis involved 350 respondents who were nurses from four hospitals in Gresik Regency. Test construct validity with factor analysis using the R program, the data included in the factor analysis were five QNWL constructs containing 10 indicators and 35 item statements. Factor analysis involved 350 respondents who were nurses from four hospitals in Gresik Regency. Construct validity with loading factor of all indicators above 0.50, namely trust

Table 1 Initial draft and final results for the outline quality of nursing work life instrument

Construct	Indicator	Number of Items	
		Initial draft	Final result
Trust 20%	1. Trust of supervisor to subordinates by willing to delegate tasks that are quite risky to subordinates 2. Share information about plans and problems in the organization 3. Engaging subordinates in making important decisions	10	7
Care 23%	4. Get involved in the organization in a responsible and caring manner 5. Care for life dynamic of the organization 6. Supervisor treat each subordinate as an individual and pay attention to their needs, abilities, feelings, and aspirations	10	8
Respect 17%	7. Improve nurse's ability 8. Getting deeper knowledge about other people than just tolerance, admiration, and interference with other individuals.	10	6
Learn 26%	9. There is a passion and willingness to learn continuously for all nurses 10. Develop new skills and competencies, 11. Add new knowledge so that it will encourage the emergence of positive attitudes in the organization.	10	9
Contribute 14%	12. Providing the widest opportunity for each employee to channel the source of initiative and creativity in solving important problems faced by the organization, in developing the organization, 13. Make the climate pleasant for the organization.	10	5
	TOTAL	50	35

Table 2 The result of expert judgment based on content validity criteria

Validity Criteria	Item's Number	Number of Items
Very high (0.80 <V 00 1.00)	1, 2, 3, 5, 8, 9, 14, 15, 21, 23, 24, 25, 28, 29, 30,31 33, 35, 38, 39, 41, 42, 43, 47, 49, 50	26
High (0.60 <V ≤ 0.80)	11, 12, 13, 16, 17, 22, 34, 36, 40	9
Fair (0.40 <V ≤ 0.60)	26, 27, 32, 37, 48	5
Low (0.20 <V ≤ 0.40)	4, 6, 7, 10, 18, 19, 20, 44, 45, 46	10
Very low (0.00 <V ≤ 0.20)	None	0

(0.755; 0.753; 0.721; 0.612; 0.794; 0.786; 0.727); car e (0.742; 0.590; 0.869; 0.766; 0.648; 0.681; 0.861; 0.766); respect (0.774; 0.655; 0.795; 0.855; 0.682; 0.534); learn (0.861; 0.923; 0.766; 0.698; 0.850; 0.816; 0.822; 0.915; 0.696); and contribute (0.708; 0.870; 0.846; 0.795).

The results of this validity test were relevant to the t-test which showed the value of t count > 1.96, so it can be stated that all QNWL instruments were valid and able to explain the QNWL instrument model. The results of factor analysis with confirmatory factor analysis on each QNWL construct: trust, care, respect, learn, and contribute have met the established goodness of fit criteria. The probability value testing of the goodness of the index indicates a value of 0.996 and the value of RMSEA 0.012. Other model compatibility tests such as AGFI, TLI, and CFI also showed a value of ≥ 0.90, so it could be stated that existing construct can confirm the theory of QNWL which was the basis for developing instrument.

DISCUSSION

QNWL is an organizational behaviour variable that gets a lot of attention from practitioners and academics in the field of organizational behaviour. Thus, it needs to be formulated more sharply based on the standard. During this time, the QNWL variable still has various meanings. QNWL is partly defined as matters related to physical welfare or work environment. Meanwhile, there is also a definition stating QNWL as a variable associated with psychological well-being related to job satisfaction and calm at work. This study seeks to define QNWL as an organizational cultural value that creates a work atmosphere which is conducive to psychological well-being and nurse performance. QNWL is influenced by internal and external factors.

Internal factor is the environmental condition of nurses that come from individuals and nurse organizations, while the external factor is the condition of the quality of nursing work life that comes from outside the nurse organization. Those factors are divided into three parts, namely patient demand on health system demand, health care policy or health policy, and labour market nursing.

In this study, the instruments of QNWL we used were different from the previous research. The previous research used a theory of Brook and Anderson consisting of 42 items, and it has four sub-scales (home/work life; work organization/design; work condition/contention; and work world). In this study, dimensions were used according to Riyono (2012) whose assessment was based on psychological aspects. These dimensions consisted of 35 items and five aspects including trust, care, respect, learn, and contribute (Riyono, 2012), while the previous research was more about physical evaluation. This was because this study used a theory stating that QNWL was an organizational culture which was balance-oriented between productivity and employee benefits (subjective wellbeing).

QNWL, in this case, is the employee's perception of the hospital or organization where the nurses work. QNWL is also quite individual because QNWL is how nurses in a hospital or organization assess the hospital or organization in paying attention to their welfare and work productivity. In QNWL, it is applied how hospitals are able to increase the productivity of nurses' work, and the welfare of nurses is also fulfilled at the same time. Thus, there is a balance in QNWL concept between nurse welfare and productivity. This is directly related to job satisfaction since job satisfaction is basically individual and personal, so the things that exist in QNWL concept itself affect employees' job satisfaction. Simply, the higher the QNWL, the higher the job satisfaction of the nurse will be.

Testing of content validity index (CVI) using expert panels was commonly used in the process of organizing instruments as performed by (Salimi and Azimpour, 2013). The content validity index (CVI) in QNWL was between 0.2075 and 0.915, with very high criteria of 52% and high criteria of 18% according to the assessment of 100 experts at the scale of 1-5. In a study conducted by (Sirin, 2015) in Turkish, which used 11 experts in the nursing field, the CVI values were 0.91 with the scale of 1-4.

Instrument reliability (internal consistency) was applied in this study, the intention was that we tested the instrument once only, and then the data obtained from the trial was analyzed using Cronbach α coefficient. This coefficient had a range of 0-1, which was used to obtain an estimation of internal consistency reliability (Bryne, 2009).

The research results of the reliability test of QNWL instruments using Cronbach alpha was 0.9374, which was higher than the reliability test of a benchmark (Azwar, 2012) stating that the minimum standard of the test was 0.90 with high takes. Research conducted by Fu Xia, et al, (2015), has Cronbach alpha value of 0,912, and research conducted by Lee Y.W, et al (2014) has Cronbach alpha value of 0.72 - 0.89. In conclusion, the QNWL instrument Cronbach α coefficient results are better than those of the previous studies. The test of discrimination power of items in the initial stage used Pearson product moment correlation obtaining a validity score (r count) ranged from 0.33 9 - 0.79 for 50 instrument items, then the r table was 0.279. Thus, the size of the item with r count was bigger than r table meaning that the validity score can be a sufficient reason to state that QNWL instrument was valid. In a study conducted by(Lee et al., 2014) , the value of r = 0.72,which was contrary to a study conducted by Xia Fu, Xu Jiajia et al (2015) stating that there were 6 items with a low score in the Pearson product moment correlation and were eventually removed from the model. The final results of testing QNWL instrument showed that there were 35 valid items out of 50 items. Table 2 showed the initial and final drafts for the QNWL instrument.

The construct validity of this research was expected to prove that the measurement results

obtained through item statement were highly correlated to the theoretical construct of QNWL instrument development. According to Azwar (2012), the validity was conducted through three stages, namely articulating the theoretical concept and the relational principle, developing a way to measure the theoretic hypothetical construct, and empirically testing the hypothetical relationship between the construct and its manifestation, (Devellis, 2012).

This study used factor analysis with confirmatory factor analysis (CFA) to determine the validity of the constraints of QNWL instruments. The aim of CFA was first, to analyze the validity of the instruments, provided that if the load factor (λ)> 0.3 then the instrument was valid; second, to identify the dimensions of the instrument in order to test whether these dimensions were confirmed as well as empirical data truly match. The results of factor analysis with confirmatory factor analysis on each QNWL construct were: trust, care, respect, learn and contribute, of which all results were well. Evaluation of goodness of fit index based on the results of factor analysis showed that the constructs used to form the QNWL model have met the established criteria for goodness of fit index, (Hair, F.H, et al, 2010).

The probability value of testing the goodness of fit index was 0.996, and the value of RMSEA was 0.012. The other model compatibility tests such as AGFI, TLI, and CFI also showed a value > 0.90, so that the existing construct on QNWL model could confirm the theory of QNWL, which was the basis for developing the instrument. It was in contrast to a research conducted by Sirin & Sokmen (2015) in Turkish, showing that the probability value of testing the goodness of fit index was 0.91, and the value of RMSEA is 0.06. Likewise, a research conducted by Fu Xia, et al., (2015), showed that the probability value of testing the goodness of fit index was 0.74, and the value of RMSEA was 0.091.

CONCLUSION

Quality of nursing work life instrument in hospitals has fulfilled the criteria of validity and reliability, which include: content validity, item discrimination power, instrument reliability and construct validity. his instrument is recommended to be used to measure the quality of nursing work life by nurses in all hospital classes in Indonesia.

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Original Research

The Perception of Indonesian Nursing Students on the Learning Environment in Clinical Practice

Pepin Nahariani [1], Fahruddin Kurdi [2] and Ratna Puji Priyanti [2]

[1] Department of Fundamental Nursing and Nursing Management, STIKES Pemkab Jombang, East Java, Indonesia
[2] Department of Medical-Surgical and Emergency Nursing, STIKES Pemkab Jombang, East Java, Indonesia

ABSTRACT

Introduction: The clinical practice environment students have multiple roles as learners and service providers. At this time students are faced with a fluctuating, complex environment and far from the predictions and controls of academic teachers. The aim of this study was to evaluate nursing student satisfaction and perception of the learning environment in clinical practice.

Methods: This study used correlational analytic survey methods with cross-sectional approach. A total of 164 nursing student were selected using a convenience sampling. The data were collected in three schools of nursing in East Java. Data were obtained using the Bahasa version of the Clinical Learning Environment, Supervisions and Nurse Teacher (CLES+T). The instrument showed good validity and reliability. The data were analyzed using descriptive analytic, Spearman *rho* correlation and logistic regression.

Results: Respondents were 164 students, clinical learning practice is mainly determined by the role of nurse teacher (M = 3.82; SD = 0.496). Student satisfaction obtained at 56.7%. There was a significant relationship between clinical practice learning and student satisfaction with p-value 0.000. The highest correlation value is the role of lecturer nurse (r = 0.544), with value R^2 = 0.377, the coefficient of β adjusted highest to 2.075.

Conclusion: According to student perceptions, the content of supervisory relations, the pedagogy atmosphere in the ward/room and the role of the nurse lecturer contributed greatly to creating a conducive clinical learning environment.

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CONTACT

Pepin Nahariani
✉ ns.ratnapuji@gmail.com
Department of Fundamental Nursing and Nursing Management, STIKES Pemkab Jombang, East Java, Indonesia

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INTRODUCTION

Clinical learning practice for nursing students is an important part of the learning process because of the gap between theory and practice (Myrick & Yonge, 2005). Clinical teaching practice encourages students to prepare themselves in applying the theories gained during academic education into the clinical practice environment (Allan, Smith, & O'Driscoll, 2011). During the student clinic learning to be very vulnerable (Chan, 2001), nursing students were asked to apply theories directly to the patient as well as about the assessment of nursing staff regarding the actions taken (Chan, 2003). While in the clinical practice environment students have multiple roles as learners and service providers (Hoffman & Donaldson, 2004). At this time students are faced in a fluctuating, complex environment and far from the predictions and controls of academic teachers. While in the clinical practice environment nursing student's has a close bond with the real work environment, in which nursing students' has multiple roles as learners

and service providers (Allan et al., 2011; Chan, 2003; Ip & Chan, 2005; Papp, Markkanen, & von Bonsdorff, 2003).

Therefore, the nursing student faced conflict in clinical learning, besides the role conflict students are also faced with the fear of hurting patients and making mistakes (Chan, So, & Fong, 2009; Elliott, 2002; Moscaritolo, 2009). Students feel that their limited knowledge and other anxieties will impact the mistakes they make in clinical learning on career paths when they graduate (Elliott, 2002). All forms of conflict and challenges faced by students in clinical practice, of course, can not be separated from the guidance of academic lecturers. The role of nursing lecturers in clinical teaching practice is important. A nursing lecturer is someone who knows the nursing dedication, custody of clinical placement, as well as student skills and expertise (Papp et al., 2003). However, the characteristics of the nurse lecturers that want perfection from student performance lead to another source of anxiety for students (Saarikoski, Warne, Kaila, & Leino-Kilpi, 2009).

Thus, based on the perception of nursing students, the conducive clinical practice learning environment is highly conquered (Antohe, Riklikiene, Tichelaar, & Saarikoski, 2016). The environment in which the atmosphere supports students to learn recognizes wrongdoing, provides full moral support, as part of the learning process (Warne et al., 2010). So they can build their full capacity during the learning process. For that, an evaluation of the clinical practice learning environment is needed. An assessment of the clinical practice learning environment of nursing student perceptions, and satisfaction of clinical practice learning as one of the strategies to create an effective and conducive learning environment. However, there is lack information about nursing student perceptions and satisfaction of clinical learning environment in Indonesia. The aim of this study was to evaluate the nursing student satisfaction and perception of the learning environment in clinical practice and hospital-based supervision.

MATERIALS AND METHODS

This study used correlational analytic survey method with a cross-sectional approached. The study population is the nursing student school of nursing in Indonesia. The population was nursing students in three schools of nursing in East Java Province, Indonesia, as many as 214 people. A total of 180 respondents was selected by a convenience sampling technique. Convenience sampling is a type of nonprobability sampling where members of the target population that meet certain practical criteria, such as easy accessibility, geographical proximity, availability at a given time, or the willingness to participate in the study (Etikan, Musa, & Alkassim, 2016).

The clinical learning environment, supervision and nurse teacher variable was assessed by Clinical Learning Environment Scale + Nurse Teacher (CLES+T) based on the fundamental theory of clinical learning (Saarikoski, Isoaho, Warne, & Leino-Kilpi, 2008). The instrument consists of 34 statements divided into five sub-dimensions, namely the atmosphere of learning strategy (pedagogy) in ward (9 statements), supervision relationship (8 statements), headroom or ward managers (4 statements), and the role of lecturer nurse (9 statements). Also, one sub-dimension was about student satisfaction in clinical practice. The nursing student assessment used ordinal scale: very dissatisfied, dissatisfied, neutral, satisfied and very satisfied. Reliability for this instrument has been reported using Cronbach's alpha with values ranging from 0.96 (height) to 0.77 (marginal) (Saarikoski, 2002).

The English version of the CLES+T had been translated into backward-forward Indonesian by using international guides (Epstein, Santo, & Guilemin, 2015). The result of Content Validity Index-for Scale (S-CVI) obtained 0.9405, while the validity test using Principal Component Analysis (PCA) test with N = 46, obtained eigenvalue and explanation percentage of 67%, and Cronbach alpha of 0.786 (Priyanti & Nahariani, 2016). These results were similar to the results of validity and reliability in the development of English version of the instrument, PCA 67% and Cronbach alpha of 0.90 (Saarikoski, 2002).

Data Collection

The data were collected from students practicing clinical learning from three schools of nursing in East Java. All of those students were in the fifth year or doing professional nursing stage in hospital. They were offered to participate in this study by giving an explanation of research subject sheet. This explanation contained the research title and objectives, the name of principal investigator, and the address of the principal investigator. Students filling out the inform consent were considered willing to participate in this study. In addition, prospective respondents would also get a procedure to answer the questionnaire. All data were analyzed using SPSS version 17 for Windows and p values of less than 0.05 would be considered statistically significant. The data were analyzed using Spearman rho correlation for bivariate analysis and logistic regression for multivariate analysis.

Ethical Considerations

The ethical clearance had been obtained from the Faculty of Nursing Universitas Airlangga's Health Research Ethics Committee number 228-KEPK dated August 12th, 2016. An anonymity, and coding systems are used in the analysis of research data to respect the rights and privacy of respondents. During the study, respondents were not forced to undergo research and did not have any impact on the respondents.

Table 1 Characteristics of the Respondents (N=164)

Variables	n	%
Age		
20-22 years	89	54.3
23-35 years	70	42.7
26-28 years	5	3.0
Gender		
Male	49	29.9
Female	115	70.1
Practice Stage		
Mental Health Nursing	13	7.9
Community Nursing	33	20.1
Medical-Surgical Nursing	62	37.8
Pediatric Nursing	26	15.9
Maternity Nursing	15	9.1
Gerontological Nursing	14	8.5
Emergency Nursing	1	0.6

Table 2 Clinical Learning Environment, Supervision and Nurse Teacher CLES+T (N=164)

Sub Dimension	M	SD	SE
Pedagogical Atmosphere in The Ward	3.64	0.461	0.036
Leadership Style of The Ward manager	3.76	0.539	0.042
Premises of Nursing on The Ward	3.65	0.476	0.037
Supervisory Relationship	3.83	0.426	0.033
Role of Nurse Teacher	3.82	0.496	0.039

Table 3 Supervisory Relationship (N=164)

Variables	n	%
Title of supervisor		
Nurse	33	20.1
Nurse Specialist	5	3.0
Assistant ward manager	34	20.7
Ward manager	92	56.1
Supervisory Status		
I did not have a supervisor at all	7	4.3
A personal supervisor was named, but the relationship with this person did not work during the placement	18	11.0
The named supervisor changed during the placement, even though no change had been planned	15	9.1
The supervisor varied according to shift or place of work	43	26.2
The same supervisor had several students and was a group supervisor rather than an individual supervisor	61	37.2
A personal supervisor was named and our relationship worked during this placement	20	12.2
Supervision Frequency		
Not at all	39	23.8
Once or twice during the course	39	23.8
Less than once a week	20	12.2
About once a week	56	34.1
More often	10	6.1

RESULTS

The total of respondents collected from three schools of nursing was 180 out of 214 nursing students. In the tabulation and coding stage, 16 respondents were deleted due to missing data. Thus, the total number of respondents without missing data that were analyzed by statistics was 164 respondents. Respondents' age ranged from 20 to 28 years, with more than half were 20-22 year-olds (89; 54.3%). In regards to the gender, the most of respondents were female (115; 70.1%). In addition, the most of respondents (62; 37.8%) practiced at medical- surgical nursing stage which had the largest participants (Table 1).

The CLES+T scale had mean values of each sub-dimension ranged from 3.64 to 3.83. The value of the content of the supervisory relationship is given the highest score with M = 3.83; SD = 0.426 (Table 2). More than half of students were supervised by ward managers (92; 56.1%), and as many as 61 respondents (37.2%) obtained one supervisor same for one group. As many as 56 respondents (34.1%) stated that the supervision frequency was once in a week (Table 3).

Student's satisfaction with the clinical learning environment was also evaluated. More than half of the students said they were satisfied and very satisfied with the clinical learning process by 120 respondents (73.2%) (Table 4). Based on the result of bivariate

Table 4 Students Satisfaction in Clinical Practice (N = 164)

Category	n	%
Very Dissatisfied	1	0.6
Not Satisfied	2	1.2
Neutral	41	25
Satisfied	93	56.7
Very Satisfied	27	16.5
Total	164	100

Table 5. Student's Satisfaction with five Sub-Dimension of the CLES+T Scale

Sub-Dimension	r	p
Pedagogical Atmosphere in The Ward	0.425	0.000
Leadership Style of The Ward manager	0.355	0.000
Premises of Nursing on The Ward	0.357	0.000
Supervisory Relationship	0.410	0.000
Role of Nurse Teacher	0.544	0.000
Total	0.497	<0.0001

Table 6. Regression Analysis of Student's Satisfaction with CLES+T

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	0.227	0.456		0.498	0.619
Pedagogical Atmosphere in The Ward	-0.696	0.218	-0.451	-3.191	0.002
Leadership Style of The Ward manager	-0.660	0.171	-0.500	-3.863	0.000
Premises of Nursing on The Ward	-0.875	0.213	-0.586	-4.103	0.000
Supervisory Relationship	-0.705	0.222	-0.423	-3.183	0.002
Role of Nurse Teacher	3.892	0.663	2.075	5.872	0.000

statistic analysis, there was a significant correlation between student satisfaction with the five sub-dimensions CLES+T scales. The value ranges from 0.355-0.544. This coefficient correlation can be interpreted as low to moderate correlation (Sugiyono, 2008). The role of the nurse teacher obtained the biggest value = 0.544 (Table 5).

The result of regression analysis as a whole between the five sub-dimensions of CLES+T scale obtained significant value with value p-value 0.000 lower than α-value equal to 0.05, and value of F equal to 19.122, with value $R^2 = 0.377$. Among the five sub-dimensions of CLES+T, the role of nurse teacher, get the positive result of β-adjusted coefficient of 2.075, with a significant value p-value 0.000 lower than α-value of 0.05. Based on these results, it can be interpreted that for every 1-unit increase in nurse teacher sub-dimension, the nursing students' satisfaction will increase by the beta coefficient value (Table 6).

DISCUSSION

Nursing student perception of their clinical learning environment was described in five sub dimensions of the CLES+T. The supervisory relationship has the highest average among others. Most of the nursing student had describe that the supervisor as one supervisor for several students and the supervision meeting was once a week. In addition, most of nursing students were satisfied of the clinical learning environment. Which, the nurse teacher role has the highest impact of nursing student's satisfaction.

In this study, students consider the role of the nurse teacher is very important for students in the achievement of the clinical learning process (Kurdi, Nahariani, & Priyanti, 2018; Saarikoski et al., 2009). This is not in accordance with previous research, it was mentioned that the connection of supervision, culture, organizational structure, and room atmosphere could affect the clinical learning environment (Flott & Linden, 2016; Mikkonen, Elo, Kuivila, Tuomikoski, & Kääriäinen, 2016; Saarikoski, 2002). Service quality provides a great role in student clinical learning environments (Dimitriadou, Papastavrou, Efstathiou, & Theodorou, 2015; Papastavrou, Lambrinou, Tsangari, Saarikoski, & Leino-Kilpi, 2010; Warne et al., 2010), and nursing staff as role models in providing professional services to patients (Papp et al., 2003).

The learning of nursing clinics, influenced by the atmosphere of the ward/room, organizational structure and supervision (Saarikoski et al., 2008). The ward atmosphere is said to play an important role in the success of clinical learning (Saarikoski et al., 2008; Warne et al., 2010). The role of lecturers has little to do with clinical learning practices (Papp et al., 2003).

Based on the results of the study, in Indonesia, the role of nursing lecturers becomes very important for students in creating an effective clinical learning environment. Students become satisfied with the learning process if nurse lecturers are actively involved in clinical practice learning. Next is the atmosphere of learning in the room. The atmosphere

is not a conducive atmosphere, resulting in the students get their own pressure in doing clinical teaching practice. Although it is mentioned that the preceptorship model according to previous researchers is considered to be most appropriate in clinical teaching practice (Clayton, Broome, & Ellis, 1989; Happell, 2009; Myrick & Yonge, 2005; Udlis, 2008). The limited number of clinical preceptors, resulting in the supervisors who are assigned to the clinical practice learning is only one person for one group. Moreover, the high workload of nurses, most nurses who served as supervisors are ward or head managers.

The study has conducted as the basic information of student perception and satisfaction of clinical earning environment. This basic information can be used to evaluate the clinical learning environment. The result can be used to determine the conducive learning environment, and the suitable methods of clinical environment. The further study needs to determine the effectiveness of each methods of supervision and supervisor.

Nursing education curriculum in Indonesia in addition to academic education, clinical learning is needed to improve the competence of graduates. Clinical learning aims to equip students with a clinical competency, with a direct approach to patients to improve professional competence (Allan et al., 2011; Chan, 2003; Elisabeth, Christine, & Ewa, 2009). In complex and unpredictable clinical learning, students become susceptible to stress and affecting the learning process (Chan et al., 2009; Elliott, 2002; Ip & Chan, 2005; Moscaritolo, 2009; Papp et al., 2003). Therefore, creating conducive learning environment for nursing student is necessary. The selection of supervisors, type of supervision, room atmosphere and pedagogical atmosphere in clinical learning is an important consideration in planning clinical learning for nursing students.

Limitations

This study has many limitations, one of which is the convenience sampling method and only three schools of nursing in one province. A small number of samples may also affect the results of the study.

CONCLUSION

Overall, according to student perceptions, the content of supervisory relations, the pedagogy atmosphere in the ward or room and the role of the nurse teacher dominantly contributed in creating a conducive clinical learning environment. So that the results of research can be used as information about the role of teachers in creating a conducive clinical practice environment for students.

Further research is suggested to use a larger sample size and can represent the clinical learning environment in Indonesia as a whole. And using educational institutions with preceptorship learning model as a comparison with the method of learning one supervisor for one group.

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