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The Giving Cucurbita Moschata Pudding on Weight Gain Malnourished Toddlers in Jombang, Indonesia

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ABSTRACT Adequacy of nutrition and food is one of the most important factors in developing quality sources of human resources, as an indicator of the success of the development of a nation. In this case, nutrition influences on intelligence and work productivity of human resources. Currently, Indonesia is still facing nutritional problems that have a serious impact on the quality of human resources (HR). One of the problems of malnutrition that are still quite high in Indonesia is stunting and wasting in toddlers. Nutritional problems are caused by direct causes such as inadequate food intake and infectious diseases. While the indirect causes of nutritional problems are still high poverty, low environmental sanitation, inadequate food availability, poor parenting styles, and sub-optimal health services. One of the causes of malnutrition is insufficient food intake so it would be nice if food given to the undernourished according to WHO standards is made from oil, sugar, milk, water, and flour. Fulfillment of Supplemental Foods can be made by yourself with a composition that contains energy and protein intake from ingredients that are easily obtained by the community at an affordable cost. Yellow pumpkin (Cucurbita moschata), one of the local functional food ingredients, is proven to have many health benefits. The type of research used was a quasi-experimental design non-equivalent control group. This study analyzed the effect of giving cucurbita moschata pudding on increasing the weight of undernourished toddlers. experiment, the results of observations are then controlled or compared with the results of observations in the control group that did not receive the program or intervention. Data were processed using the SPSS Version 21 program. The results using the Paired Sample T-Test showed a significant number between the intervention group and the control group with a significant value (2-tailed) p=0.000 <0.05. There is an effect of giving cucurbita moschata pudding on increasing the weight of malnourished babies. The results of the research can add to the knowledge and insight of parents to give Curbita Moschata Pudding as baby nutrition and to provide proper diet and parenting patterns for babies so that babies feel comfortable when eating.

INDEX TERMS Cucurbita moschata pudding, malnutrition, fulfillment of additional food.

I INTRODUCTION

Malnutrition in infants and toddlers According to the United Nations Children's Emergency Fund (UNICEF) ranks fourth after measles, diarrhea, and respiratory tract infections. The causes of malnutrition are due to a lack of incoming food sources, delays in the food supply process, and outbreaks of diarrhea which can disrupt the digestive tract and can result in decreased appetite [1]. Malnutrition is a medical condition characterized by a deficiency or imbalance of nutrients required for healthy growth, mental function, and all other aspects of life. Especially in developing countries, malnutrition affects children under 5 years of age. As a result, it is called a vulnerable group, because the transitional period begins to follow the pattern of eating adults or parenting following wrong habits. As a result of a lack of energy sources and a lack of protein, malnutrition occurs in children. A rapidly developing child's body requires a lot of energy and building blocks[2]. Stunting or stunting is an indicator of clinical nutrition which can provide an overview of disturbances in overall socio-economic conditions in the past and as a further manifestation of the high rates of low birth weight and malnutrition in infancy and the absence of achievement of growth improvement (catch-up). up growth) perfect in the next period (Ministry of Health of the Republic

of Indonesia & United Nations International Children's Emergency Fund, 2020).

Based on the 2017 Global Nutrition Report, nutritional status problems in the world include the prevalence of wasting (thin) in 52 million children under five (85), stunting (short) in 115 million children under five (23%), and overweight 4 million children under five [4]. Based on the 2018 Basic Health Research, the national prevalence of stunting was still high at 30.8%, so from 2013, a total of 37.2% experienced a decline of only 7.2%.(Ministry of Health of the Republic of Indonesia & United Nations International Children's Emergency Fund, 2020). Based on the SSGI 2021 results, the national stunting rate shows an improvement with a decreasing trend of 3.3 percent. From 27.7 percent in 2019 to 24.4 percent in 2021. The Province of East Java (East Java) is also experiencing the same trend with a decrease of 3.35 percent. From 26.86 percent in 2019 to 23.5 percent in 2021 from around 2.8 million children under five. Thus there are around 658,000 toddlers who are still experiencing stunting or malnutrition[2].

Jombang Regency In three consecutive years the problem is Malnutrition in toddlers which is increasing. The percentage of severely malnourished children under five in 2018 was 2.1%, increasing to 2.64% in 2019 and 2.76% in 2020. Overcome this, it cannot only be handled by the health sector but also the need for integration between the government, the private sector, Non-Governmental Organizations, and Village Communities such as the Nutrition Recovery Park where one of the activities is the provision of additional recovery food based on local food ingredients with regional special menus. adapted to local conditions[3]. Based on the results of initial interviews conducted in the Working Area of the Mojoagung Community Health Center, the increasing problem of malnutrition is influenced by family parenting, the economy and low education of the mother, causing a lack of knowledge of the mother to provide food intake and fulfillment of nutritious additional food for her baby[1].

The toddler period is a period of growth and development so it is a period that is quite important. The food intake that is needed must be considered, for example by providing nutritious food. The food given to infants and children will be used for body growth, therefore nutritional status and growth can be used as a measure to monitor the nutritional coverage of infants[4]. The food given to toddlers who experience malnutrition according to the standards set by the World Health Organization (WHO) is made from oil, sugar, milk, water, and flour. In addition, the Complementary Food Supplement can be made by yourself with a composition that contains energy and protein intake and is made from ingredients that are easily obtained by the public at an affordable cost[5].

Pumpkin (Cucurbita moschata) is one of the local functional food ingredients which is proven to have many health benefits. One study (Ginting et al., 2019) proved that scientifically pumpkin was able to control blood sugar. Vitamin A, Vitamin B1, and Vitamin C, protein and carbohydrates as well as the content of 1,569 μg of β-carotene which is pro-vitamin A are the various nutrients in it. In 100 g of pumpkin seeds also contain the mineral zinc of 6.5 mg. Zinc has great benefits for body tissues, especially in the growth process. Zinc can also increase body weight due to an increase in circulating insulin such as growth factor (IGF-I), appetite, and increase energy and protein consumption. IGF-I is a mediator to promote growth hormone action[9]. Based on the description of the problem above, the purpose of this study was to determine the effect of giving Cucurbita Moschata pudding on increasing the weight of malnourished toddlers aged 1-2 years in the Work Area of the Mojoagung Health Center.

II. METHOD

The type of research used was a quasi-experimental design that was a non-equivalent control group, so the study wanted to analyze the effect of giving cucurbita moschata pudding to fulfill supplementary food on increasing the weight of undernourished toddlers in the working area of the Mojoagung Health Center, where researchers divided into two groups used for research, the experimental group and the control group carried out the first observation (pretest) which allows testing the changes that occur after being given intervention in the experimental group, the results of the observations are then controlled or compared with the results of observations in the control group that did not receive the program or intervention [10]. This research was carried out for 4 month, from September to December 2022 in the working area of the Mojoagung Health Center. The population in this study were all undernourished children aged 1-2 years in the working area of the Mojoagung Community Health Center as many as 48 toddlers. The sample of this study were 30 toddlers aged 1-2 years as sufferers of malnutrition. Fifteen (15) toddlers were given treatment and 15 toddlers were not given treatment from 48 malnourished babies who were in the working area of the Mojoagung Health Center using a purposive sampling technique, which was based on a certain consideration made by the researchers themselves, based on the characteristics or characteristics previously known population characteristics (Notoatmojo, 2012).

The inclusion criteria in this study are: Age 12 – 24 months, parents are willing to be respondents and can communicate well, have poor nutritional status (-3 SD to <-2 SD). Residing in the working area of the Mojoagung Health Center Jombang Regency, Toddlers are in good health, not suffering from infections that affect nutritional status (ARI, diarrhea, fever). The exclusion criteria in this study were: Allergy to pumpkin, Toddlers are taking supplements and medicines. The research instrument used was an observation sheet (check list), which is a checklist containing the name of the subject, and several other symptoms/identities of the target of observation. The observer only needs to put a check mark (v) on the list indicating the presence of symptoms/characteristics of the target of observation (Notoatmojo, 2012). Meanwhile, to get

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the results of increasing body weight, the researchers used baby weight scales, which are mechanical devices to measure baby weight which had been calibrated beforehand. measurement results. The independent variable in this study was the administration of cucurbita moschata pudding, while the dependent variable was weight gain. The research procedure uses an application letter to become a respondent, an explanation letter to become a respondent, and a statement of willingness to become a research respondent so that there is no coercion on the respondent. Data collection was carried out through interviews, documentation, and anthropometric measurements. Data analysis used the Paired Sample t-test.

II. RESULT

Respondents in this study were 15 malnourished infants aged 12-24 months who received the intervention and 15 malnourished infants aged 12-24 months as the control group in the working area of the Mojoagung Health Center, Jombang Regency in 2022.

TABLE 1
Frequency distribution by gender in the work area of the mojoagung community health center, jombang regency

Gender	Intervention group		Control Group	
	n	%	n	%
Man	6	40	7	47
Woman	9	60	8	53
Total	15	100	15	100

Source: Primary Data,2022

Based on the TABLE 1, it is known that the respondents under five in the Working Area of the Mojoagung Health Center, Jombang Regency in this study were in the intervention group male sex 6 babies (40%) female sex 9 babies (60%) while in the control group male sex 7 babies (47%) and female 8 babies (53%)

TABLE 2
Frequency distribution by age in the work area of the Mojoagung community health center, Jombang regency

Age	Intervention group		Control Group	
	n	%	n	%
12–16 Month	5	40	4	47
17-24 month	10	60	11	53
Total	15	100	15	100

Source: Primary Data,2022

Based on the TABLE 2, it is known that the respondents under five in the Working Area of the Mojoagung Health Center, Jombang Regency in this study were in the intervention group male sex 6 babies (40% female sex 9 babies (60%) while in the control group male sex 7 babies (47 %) and female 8 babies (53%)

TABEL 3
Weight gain before and after the intervention group and the control group

Weight	Intervention Means	Control Means
Weight before administration (gr)	8553	8527
Weight before administration (gr)	8847	8540

TABLE 3 shows that the weight of the babies who were given the intervention before being given Cucurbita moschata pudding reached a mean of 8553 and after being given pudding it reached a mean of 8847 in the 2-week period of the study, so there was an increase of 294 in body weight.

TABLE 4
The effect of giving cucurbita moschata pudding on increasing the weight of malnourished babies

Weight	Given		Not Given		P Value
	n	%	n	%	Mean
Weight Gan	14	93,3	1	6,7	0,000
No Weght Gain	1	6,7	14	93,3	
Total	15	100	15	100	

TABLE 4 shows that, after 6 months of giving Cucurbita moschata pudding, the results obtained were weight gain in 15 babies in the intervention group, 14 babies experienced an increase in body weight if presented an average of 93% of respondents experienced an increase in body weight, and 1 baby with an average of 6.7% who did not experience weight gain reached the normal limits of weight gain at the age of 12 -24 months. The test results using the Paired Sample T-Test showed a significant number between the intervention group and the control group with a significant value (2-tailed) p = 0.000 <0.05. The null hypothesis (H0) in this study was rejected and the alternative hypothesis (Ha) was accepted where there was a striking difference between the two tests.

IV. DISCUSSION

A. GENDER

Based on TABLE 1 above, almost half of the sex in the intervention group was male, namely 6 babies (40%) and 9 babies (60%) female, while in the control group 7 babies (47%) were male and 8 babies (53%) were girls. The nutritional needs of boys are different from girls and are usually higher because men have higher physical activity. Based on research [11] states that boys usually get a higher priority in terms of food than girls. Based on the research, it was found that stunting was more common in girls than boys because boys are more likely to be lazy to eat. This can also be exacerbated by the fact that boys do more physical exercise than girls [2]

During infancy and childhood, girls tend to be less likely to become stunted and severe stunting than boys, besides that baby girls can survive in greater numbers than baby boys in most developing countries including Indonesia [12]. Gender also determines the size of a person's nutritional needs. Men need more energy and protein than women. Men are more capable of doing heavy work that is not usually done by women. But in terms of iron requirements, women need more than men [13]. Result [14] shows the prevalence of stunting under five is higher in the male sex by 18.8%, compared to the female, which is 17.1%. According to [15]More boys are stunted (35.7%) than girls (31.6%).

B. AGE

The ages in this study were 30 babies in the working area of the Mojoagung Health Center, divided into two groups, namely the treatment group and the control group, each group consisting of 15 babies who met the inclusion criteria. Based on TABLE 1, shows that there were 10 infants (60%) in the Pudding Curbita Moschata intervention group aged 17-24 months and 5 infants (40%) in the control group aged 17-16 months. 24 months as many as 11 babies (63.3%) and aged 12-16 months as many as 4 babies (37.7%). Toddler age is an age that is vulnerable to malnutrition because toddler age experiences growth and development cycles that require higher levels of nutrients compared to other ages so toddlers are the easiest to experience nutritional disorders[16].

Toddlers aged 12-35 months have a 3.34 times greater risk of experiencing malnutrition compared to toddlers aged 36-47 months and 48-59 months [17]. Biological risk factors experienced by toddlers include genetic factors or physical factors that play an active role in the emergence of certain risks that threaten health. The age of toddlers who are still young causes the immune system to not develop optimally so malnutrition often occurs[18].

C. WEIGHT GAIN BEFORE AND AFTER IN THE INTERVENTION GROUP AND THE CONTROL GROUP.

Body weight is one of the parameters that give an overview of body mass. Body mass is very sensitive to sudden changes, for example, due to infection, decreased appetite, or decreased amount of food consumed. Body weight is a very unstable anthropometric measure [19]. Based on the TABLE 4, shows that the weight of infants who were given intervention before being given Cucurbita moschata pudding reached a mean of 8553 and after being given pudding it reached a mean of 8847 in the 4 months of the study, so there was an increase of 294 in body weight. The TABLE 4 also shows that there was an increase in the weight of the babies who were used as the control group reaching a mean of 8527 in 4 months of the study reaching 8540 there was an increase of only 13.

According to the researchers, the intervention group experienced an increase compared to the control group. The administration of Cucurbita moschata which was given to infants was very good for improving nutrition in infants with malnutrition because Cucurbita moschata contains vitamin A it has a major influence on improving nutrition which can increase body weight. Accordance to research[20] states that the content of Cucurbita moschata contains vitamin A which plays an important role in the regulation of the immune system so a deficiency of vitamin A can increase susceptibility to infection. The results of the study [21] explain that giving biscuits fortified with pumpkin seeds can increase food intake. The addition of pumpkin seeds 249 can increase the content of Fe and zinc in biscuits. The addition of 33% pumpkin seed flour to biscuits can increase Fe significantly when compared to control biscuits. In addition, the biscuits added with pumpkin seeds are also healthy biscuits that are rich in antioxidants and have a low glycemic index, so pumpkin seeds can be used as an alternative to address nutritional problems in children and adolescents. In accordance with research [8] found that the addition of food in the form of adjustments is very important in improving the nutritional status of toddlers. This research is in line with its findings. In line with research [22] showed that there was a change in body weight before and after giving modify additional food (pumpkin cookies) for 14 days based on a weight gain of up to 0.400 kg.

D. THE EFFECT OF CUCURBITA MOSCHATA PUDDING ON INCREASING THE WEIGHT OF MALNOURISHED BABIES

Based on the TABLE 4, after 4 months of giving Cucurbita moschata pudding, the results obtained were weight gain in 15 babies in the intervention group, 14 babies experienced weight gain if presented an average of 93% of respondents experienced weight gain and 1 baby with an average of 6.7% who did not gain weight. In contrast, in the control group, only 1 baby had an average weight gain of 6.7% and 14 babies 9.3% had no weight gain. According to researchers, because Cucurbita moschata pudding contains a lot of vitamin A for a baby's eye health, it contains vitamin C and fiber. So that Vitamin A in Cucurbita moschata can increase susceptibility to infection and restore the body condition of infants with malnutrition which can reshape the baby's immune system. By research [20] pumpkin contains vitamin A, vitamin C, and fiber which is a high beta carotene food that is good for improving vitamin A status and reducing the incidence of infection in children with heavy diets which can cause malnutrition if left untreated. well. Supported by research [1] vitamin A which is contained in pumpkin is needed for the development of bone and epithelial cells which function to form email in the growth of teeth. If vitamin A is deficient, bone growth is hampered so that the bones form abnormally. In children who are deficient in vitamin A, there is failure and growth.

Cucurbita moschata pudding which is rich in vitamin A is an essential factor for the development of the lymphoid system and the development of the mucosa of the digestive, respiratory and genitourinary tracts which play a role in the formation of tissue cells that are damaged due to lack of nutrition increasing the nutritional status of infants [1]. When babies consume Cucurbita moschata, good nutrients enter the baby's body, which can improve the nutritional status of malnourished babies. The presence of incoming vitamins can repair tissue cells damaged due to malnutrition. In the opinion of the researcher, there was 1 respondent who did not experience weight gain by the normal limits for weight gain, due to the influencing factors, namely diet and parenting patterns of parents who were still very lacking in paying attention to their children, due to parents' inattentiveness to feeding the baby besides that the child's appetite tends to be lacking because the baby feels discomfort when feeding it.

According to research [23], nutritional status is influenced by 2 causes, namely direct and indirect causes. The direct cause is food intake and infectious diseases

suffered by children indirectly influenced by parenting, economic factors, culture, knowledge, and education.. Knowledge about preparing menus to meet the needs of infant food intake is very important because it will have an impact on the nutritional status of children. By the theory [7] the parenting style given by parents to their children influences nutritional problems because every child needs love, attention, and affection which has an impact on physical, mental, and emotional development. The results of the study [17] showed that there was a significant relationship between family upbringing and the nutritional status of toddlers (p-value = 0.045). Parenting styles associated with poor nutritional status are 2.96 times more likely to get undernourishment than those with good parenting styles (OR=2.955). At the age of toddlers, it is still in the dependency stage to fulfill basic needs so the role of parents or caregivers is very influential in providing food intake and depending on how to care for, feed, and how care for health by parents or caregivers.

Another theory defines pressure to eat as the act of encouraging a child to eat. Parents often exert pressure on children in eating activities to increase the child's weight. Another form of pressure that is often done is by speaking harshly, yelling, and forcing the child to eat the food that has been provided, so that the child will feel that eating is an unpleasant activity that has an impact on the child's loss of appetite resulting in growth [24]. According to research [25], parents' behavior will be imitated by children who often choose food based on taste (favorites). Conversely, if parents consume vegetables and fruits and avoid consuming unhealthy foods in front of their children, it will reduce the risk of children consuming unhealthy foods. According to the researchers, the effort must be made by mothers in providing food that mothers must be able to make a proper and routine meal schedule every day and make mealtimes fun without yelling, speaking harshly, and forcing children to finish the food. Make food that is more varied or interesting for the baby, maybe you can make food like bento rice to attract the baby's attention. Make the home environment the most comfortable environment for babies and prevent babies from eating instant foods and snacks that are without calories so that babies get used to eating nutritious foods. This is in line with research [2] There was an effect of giving pumpkin flour and tempeh flour biscuits on changes in the weight of undernourished toddlers in the working area of the Punti Kayu Health Center with an average sample weight before the intervention in the treatment group, namely 9 .73 kg to 10.36 kg after the intervention. Whereas in the comparison group, the weight before the intervention was 9.45 kg to 9.59 kg after the intervention. To support this finding, research [26] found that the weight gain of undernourished toddlers was largely due to energy and protein intake from the consumption of modified PMT, along with increased nutrition from other main sources. The results of this study are in line with the results of research [27] which found that giving Modif PMT to malnourished toddlers increased body weight. Giving pumpkins increased the average weight of the treatment group from 9.7 to 10.0 kg. The results of the analysis showed the value of $\rho < \alpha$ (<0.05).

E. PAIRED SAMPLE T-TEST RESULTS

Based on the test results using the Paired Sample T-Test, showed a significant number between the intervention group and the control group with a significant value (2-tailed) p = 0.000 <0.05. The null hypothesis (H0) in this study was rejected and the alternative hypothesis (Ha) was accepted where there was a striking difference between the two tests. This means that there is an effect of giving Cucurbita Moschata Pudding on weight gain in malnourished babies. The results of this study are in line with research conducted by[20], namely that there were significant differences (p <0.05) in energy, carbohydrate, fat, and protein intake before and after administration of fish-based instant MP-ASI porridge cork and pumpkin. There was a significant effect of both intervention and non-intervention intake on intake after intervention (p<0.05). This is due to the zinc content contained in pumpkin seeds and the content of vitamin A in papaya which can increase appetite in undernourished toddlers. Zinc can increase body weight by increasing circulating insulin-like growth factor (IGF-I), appetite, increasing energy and protein consumption. IGF-I is a mediator of growth to promote growth hormone action [2]. The results of this study were supported by research [28], which stated that there was an effect of giving pumpkin seeds increasing zinc levels given as much as 10 grams for 28 days. The zinc content in pumpkin seeds acts on the alkaline phosphatase enzyme produced in osteoblasts and provides calcium deposits in the bone diaphysis. Alkaline phosphatase levels decreased followed by a decrease in zinc in malnourished children, this indicates that zinc deficiency affects the activity of the alkaline phosphatase enzyme [2]. In line with the book [2] shows that giving biscuits fortified with pumpkin seeds can increase intake. Accordance to research [26] found that the cause of under-5 weight gain is largely due to energy and protein intake obtained from the fulfillment of additional food that has been modified with nutrients from other sources. This is in line with research [27] which states that giving PMT modifiers to malnourished toddlers can increase weight gain. Giving pumpkin increased the average weight of the treatment group from 9.7 to 10.0 kg, and the analysis results showed a value of $p < \alpha$ (<0.05). Several other studies have also shown that giving biscuits fortified with food ingredients such as purple sweet potato, yellow sweet potato, tempeh, rice bran, tilapia fish, and snakehead fish can increase nutritional intake in research participants. In this study, the weakness was that PMT modifications were lacking so only Yellow Pumpkin was used as PMT. It is suggested that for further research you can add other PMT modifications with pocket-friendly themes as well. Because most people in the village are reluctant to spend a lot of money to give PMT to their children.

V. CONCLUSION

The aim of the research which was conducted for four months in the Working Area of the Mojoagung Health Center was that there was an effect of giving cucurbita moschata pudding on an increase in the weight of malnourished babies by 93%. Giving cucurbita moschata pudding resulted in weight gain in 15 babies in the intervention group, 14 babies experienced weight gain when presented an average of 93% of respondents experienced weight gain, and 1 baby with an average of 6.7% did not experience weight gain. In contrast, in the control group, only 1 baby had an average weight gain of 6.7%, and 14 babies 9.3% had no weight gain. So it can be concluded that cucurbita moschata is effective for increasing body weight in infants with malnutrition. It is hoped that all health service providers for malnourished or stunted babies can provide additional food fulfillment, one of which is by giving Curbita moschata pudding. Further studies are needed to combine the fulfillment of additional food pudding with cucurbita moschata with other foods to increase body weight in infants with malnutrition.

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