



## **Impact of High-Calorie, High-Protein Nutrition Education on Mothers' Knowledge and Attitudes.**

**Khansa Mutiara Hasna<sup>1</sup>, Sandi Ari Susiatmi<sup>2</sup>**

<sup>1,2</sup> Universitas Muhammadiyah Pekajangan Pekalongan, Jl. Raya Pekajangan No.1A, Pabrik Kulon, Pekajangan, Kec. Kedungwuni, Kabupaten Pekalongan, Jawa Tengah 51172

Email: [khansamutiara98@gmail.com](mailto:khansamutiara98@gmail.com)<sup>1</sup>, [sandi.kedungwuni@gmail.com](mailto:sandi.kedungwuni@gmail.com)<sup>2</sup>

### **ABSTRACT**

*Stunting is defined as a short or very short body condition based on the index of Body Length by Age or Height by Age with a threshold (z score) between -3 SD to -2 SD. This study aims to evaluate the impact of high-calorie, high-protein nutrition education on mothers' knowledge and attitudes in feeding stunted toddlers aged 24-59 months. This study used a pre-experimental design with a one group pre-test post-test design. The pre-experimental design includes one group and involves measurement before and after the intervention. The results of data analysis using paired t test to assess the knowledge and attitude of mothers in providing food to toddlers showed a significance value of  $p = 0.000$  ( $p < 0.05$ ). This shows that nutrition education has a significant effect on increasing the knowledge and attitudes of mothers in providing food to toddlers. Nutrition education significantly improved mothers' knowledge and attitudes, as indicated by a statistical test result of  $p = 0.000$ .*

**Keywords:** *Stunting, Education, Knowledge, Attitude*

## INTRODUCTION

Stunting is a serious problem all over the world. In 2022, there were 148.1 million children under the age of five who were stunted, nearly 45.0 million children who were always thin, and 37.0 million children who were always overweight, compared to their parents' weight (WHO, 2023). About 148.1 million children under the age of five are stunted worldwide, or 22.3% of all children who are stunted, according to the 2018 Joint Estimates of Child Malnutrition report. More than half of children who experience stunting worldwide are from Asia (55%) and more than half (39%) are from Africa. South Asia accounts for the highest percentage (58.7%), followed by Southeast Asia (30.1%) and Central Asia (0.9%) (WHO, 2023).

According to data from the Asian Development Bank, the prevalence of stunting among children under five in Indonesia was 31.8% in 2022. Indonesia is ranked 10th in Southeast Asia based on this figure. This condition is caused by malnutrition from pregnancy to the age of 2 years old (the First 1000 Days of Life Period) which is a critical period (Astuti, 2018). The period of the first 1000 days of life (HPK) covering 270 days during pregnancy and the first 730 days after the baby is born is a critical period that

determines the quality of life of the child (Damanik et al., 2021).

Stunting is defined as a condition where the body is short or very short based on the index of Body Length by Age (PB/U) or Height by Age (TB/U) with a threshold (zscore) between -3 SD to < -2 SD (Olsa, Sulastri, & Anas, 2017).. Children aged 24-59 months have a higher prevalence of stunting and severe stunting than children aged 0-23 months, according to Ramli's research in North Maluku (Ramli in Utami et al., 2021). This is in line with research from Bangladesh, India, and Pakistan that indicates that stunted growth is more common in children aged 24-59 months. Children between the ages of 24 and 59 months often experience stunting, which indicates that this condition is irreversible (Ramli in Utami et al., 2021). In addition, the age range of 3 to 5 years is often referred to as the preschool period experiencing a slowdown in the growth rate of Brown in (Utami et al., 2021). This shows the need for a relatively higher quality diet for children under five.

The causes of stunting are from various factors, one of which is maternal factors. Maternal factors are in the form of insufficient nutrition at the time of preconception, pregnancy, lactation, low maternal height, infections, teenage pregnancy, mental health, Intra Uterine

Growth Restriction (IUGR) and preterm birth, short pregnancy intervals, and hypertension (WHO in stunting bulletin, 2018). Another causative factor is the provision of nutrition in each child's growth and development during the golden age. Also, the low nutrition provision during the golden age in Indonesia and developing countries. This can be an indication of the high prevalence of stunting in toddlers in the country. Stunting is a cumulative process caused by malnutrition (Ayuningtyas, Simbolon and Rizal, 2018).

Macronutrient intake is a factor related to the incidence of stunting in toddlers. Based on the results of previous research by (Tangkudung, 2014) it is shown that macronutrient intake is closely related to the incidence of stunting in toddlers. Energy is one of the indicators of macronutrients needed by toddlers (Sidiartha, 2015). An inadequate energy intake is associated with the risk of stunting in toddlers. In addition to causing poor nutritional status, energy intake is also related to the developmental rate of stunted children. Children under five with stunting have a low level of development compared to children who have normal nutritional status (Adani and Nindya, 2017). Protein has a major role in growth in children under five. Protein intake is

related to the effects on plasma levels of insulin growth factor I (IGF-I), bone matrix protein, and growth factor, as well as calcium and phosphorus which play an important role in bone formation (Sari et al., 2016). A child who is stunted has a lower protein intake compared to a normal child (Cahyati and Yuniastuti, 2019). Protein intake is related to serum transthyretin (TTR), serum amino acids and serum insulin-like growth factor-1 (IGF-1) which have a role in the linear organization and development of toddlers (Tessema et al., 2018). Therefore, quality protein intake is needed to increase the linear growth of stunted toddlers.

In addition to the nutritional intake factors that cause stunting, namely maternal knowledge, maternal attitude, maternal age, poor parenting practices, good feeding practices, food safety, maternal education and maternal work. The level of maternal knowledge greatly affects the incidence of stunting because children born to mothers who have good nutritional knowledge are not too at risk of stunting than children whose parents have a low level of knowledge (Kusumawardani et al., 2022) and there are still many mothers who do not know about the food needed by a child during their growth and development. they only look at the large amount of food given without looking at the amount of

nutrients in the food, besides that there are still many mothers who give instant food etc (Rini et al, 2023). In addition to poor maternal knowledge and attitudes, Paramita et al.'s (2021) research strengthens the theory that respondents' knowledge of feeding is also related to the incidence of stunting. Efforts to improve nutrition begin at the beginning of the fetus' life. The importance of this is because it is able to support growth and development and improve better nutrition (Puspita et al., 2021)

Improving nutrition and providing good food is closely related to education, attitudes and knowledge about meeting the nutritional needs of toddlers. Insufficient knowledge and inappropriate practices are one of the obstacles to improving nutrition (Sari, 2022). The provision of nutrition education has the goal of reducing nutrition problems which aims to change the knowledge, attitudes and behaviors of parents or caregivers related to balita nutrition. The attitude change approach used is usually focused on the elderly as the closest people in nutrition, MP-ASI, IMD, ASI up to 2 years, the type of food, diet and drink recommended increases (Naulia et al., 2021). By meeting the nutritional needs of calories and proteins as well as increasing the knowledge and attitude of mothers in providing good food,

although stunting is irreversible but can prevent severity or prevent the worsening of the condition of toddlers.

Based on data from the Pekalongan Regency Health Office in 2023, the total number of stunted toddlers in the Pekalongan Regency area is 2,912 people through a percentage of 11.1%, where the highest stunting incidence rate is at the Karangdadap Health Center with a prevalence of 11.7% or as many as 340 toddlers. Based on data from the Karangdadap Health Center, the number of stunting is 335 toddlers covering the age of 0-23 months with a prevalence of 32.8% or as many as 110 toddlers and the age of 24-59 months with a prevalence of 67.2% or as many as 225 toddlers.

Based on the results of a preliminary study with interviews with 8 mothers who have stunted toddlers conducted in Kebonsari Village, the work area of the Karangdadap Health Center, Pekalongan Regency, as many as 75% of mothers who have stunted toddlers stated that they do not know high calorie, high-protein nutrition and have not carried out principles in providing good food such as paying attention to healthy, nutritious, and varied food at home. Up to 62.5% of mothers still let their children's preferences guide their feeding decisions. Mothers consider it natural for their toddlers to prefer snacks to family meals.

Based on this description, the author is very interested in conducting research on the impact of high-protein and high-calorie nutrition education (TKTP) on mothers who have stunted toddlers aged 24-59 months on their knowledge and attitudes in providing food to their children.

## METHODS

The design of this study uses a pre-experimental design with a one group pre-test post-test design. The research location is in 10 villages in the working area of the Karangdadap Health Center, Pekalongan Regency. The population used was 225 stunted mothers under five. The sampling method uses systematic random sampling and there are sample limitations stated in the inclusion criteria; The value of the TB/U z-score is less than -2 SD to -3 SD (short/stunted) and <-3 SD (very short/severely stunted), the mother is easy to communicate and does not experience

hearing loss, willing to participate as a research subject, the entire research subject follows all the stages given. Exclusion criteria; It does not have congenital diseases such as heart and cerebral palsy. Researchers sampled 40 stunted mothers under five.

## RESULTS AND DISCUSSION

### Result

The research took place between December 20 and December 31, 2023. 40 mothers who met the inclusion criteria became respondents to this study; they are all mothers of toddlers who live in 10 villages in the working area of the Karangdadap Health Center, Pekalongan Regency. The purpose of this study is to find out how high calorie, high protein nutrition education (TKTP) affects the knowledge and attitude of stunted mothers of toddlers aged 24-59 months in providing food to their children. Here are the findings of the study:

**Tabel 1. Distribusi Frekuensi Berdasarkan Karakteristik Responden**

Variabel	Frekuensi	Persentase (%)
<b>Age</b>		
<35 years old	29	72.5
>35 years old	11	27.5
<b>Education</b>		
SD	15	37.5
SMP	17	42.5
SMA	8	20.0
<b>Work</b>		
IRT	28	70.0
Laborer	12	30.0
<b>Income</b>		
<2 millions	31	77.5
≥2 millions	9	22.5
<b>Food abstinence</b>		
Yes	40	100.0

No	0	0.0
<b>Number of children</b>		
<2	31	77.5
>2	9	22.5
<b>History of the disease during pregnancy</b>		
Note	37	92.5
Exist	3	7.5
<b>Birth History</b>		
Usua	27	67.5
Sectio caesare	13	32.5
<b>Birth Weight</b>		
<2,5 kg	4	10.0
≥2,5 kg	36	90.0
<b>Birth Length</b>		
<50 cm	26	65.0
≥50 cm	14	35.0
<b>The youngest child</b>		
<2	36	90.0
>2	4	10.0
<b>Exclusive Breast Milk</b>		
Not	3	7.5
Yes	37	92.5
<b>Complementary Foods</b>		
<6 Months	4	10.0
6 Months	30	75.0
>6 Months	6	15.0
<b>Weaning time</b>		
<2 years	15	37.5
2 years	19	47.5
>2 years	6	15.0
<b>Toddler age</b>		
<24-35 Months	8	20.0
>36-59 Months	32	80.0
<b>Gender</b>		
Man	15	42.5
Woman	17	57.5

Based on table 1. the results of the study show that the results of the analysis of the age variables were obtained that more than half of the respondents 29 (72.5%) had an age range of <35 years. The results of the analysis of the education level variables showed that less than half of the 17 respondents (42.5%) had a junior high school education. The results of the analysis of the work variables showed that more than half of the 28 respondents (70%) were housewives. The results of the analysis of family income variables showed that more than half of the 31

respondents (77.5%) had an income of <2 million. The results of the analysis of family culture variables showed that all of the 40 respondents (100%) did not abstain from food in choosing the type of food to be given to their children.

The results of the analysis of the number of children variable showed that more than half of the 31 respondents (77.5%) had a <2 number of children. The results of the analysis of the variables of disease history during pregnancy found that more than half of the 37 respondents (92.5%) had no history of disease during pregnancy. The

results of the analysis of the birth history variables showed that more than half of the 27 respondents (67.5%) had a normal vaginal birth history. The results of the analysis of 40 respondents on the birth BB variable showed that more than half of the 36 respondents (90%) with a birth BB > 2.5 kg. The results of the analysis of the birth PB variable showed that more than half of the 26 respondents (85.5%) with birth PB were <50 cm. The results of the analysis of the 1st child variable found that more than half of the 36 respondents (90%) were 2nd children of their parents. The results of the analysis of the exclusive breastfeeding variable showed that more than half of the 37 respondents (92.5%)

applied exclusive breastfeeding. The results of the analysis of the complementary food variables showed that more than half of the 30 respondents (75%) started complementary foods from the age of 6 months. The results of the analysis of the weaning time variable showed that less than half of the 19 respondents (47.5%) were successfully weaned at the age of 2 years.

The results of the analysis of the child's age variable showed that more than half of the respondents were 32 (80%) aged 36-59 months. The results of the analysis of the gender variables showed that more than half of the 23 respondents (57.5%) were female.

**Table 2. Test the Influence of Knowledge and Attitude in Feeding Before and After Providing TKTP Nutrition Education**

Variabel	Mean	SD	SE	P Value	N
Knowledge Pretest	10,05	2,331	0,369	0,000	40
Knowledge Posttest	14,35	1,642	0,260		40
Attitude Pretest	37,03	3,697	0,585	0,000	40
Posttest Attitude	38,98	3,408	0,539		40

Based on the table above, it is known that the results of the data analysis of the paired test of maternal knowledge in feeding obtained a significance value of  $p = 0.000$  ( $p < 0.05$ ) so that it can be concluded that  $H_a$  was accepted and  $H_o$  was rejected, which means that TKTP nutrition education has an effect on maternal knowledge in feeding children

under five. The results of the analysis of the data of the paired test of maternal knowledge in feeding obtained a significance value of  $p = 0.000$  ( $p < 0.05$ ) so that it can be concluded that  $H_a$  was accepted and  $H_o$  was rejected, which means that TKTP nutrition education has an effect on the attitude of mothers in feeding children under five.

## **Discussion**

### **Respondent Characteristics**

Based on the results of the study, it shows that more than half of the respondents are >35 years old, which is 29 people (72.5%). The age of a person who is still in productive age tends to affect their ability to more easily accept new things. This condition also triggers the ease of receiving new information related to their health, especially information about nutrition that is relevant to the growth and development of toddlers. A similar study was put forward by Yu, S.H., et al. (2016), the relatively young age of the mother is closely related to growth failure in infants 0-11 months. Another study showed results that were in line with this study, where age too old (>35 years) had a significant relationship with the incidence of stunting and was 4 times higher risk of having stunted offspring compared to mothers of ideal age (20-35 years) (Manggala, A.K., et al. 2018).

The last education of the most mothers was junior high school with 17 people (42.5%). Based on education level, most of the respondents (mothers) have a Junior High School (SMP) education level. Maternal education has a very significant role in determining the nutritional status of children, especially in children. Increasing the level of maternal education will have

an impact on investment in quality human resources. This is because the increase in maternal education is positively related to the improvement of nutritional status in toddlers (Tazinya et al., 2018). A mother who has higher education has the ability to understand and determine a good parenting style for children, including in the selection of food for toddlers.

More than half of the work of mothers is as a housewife as many as 28 people (70%). As a housewife, having more free time at home can encourage greater access to a variety of sources of information, including through television, brochures, the internet, and radio. By having this wider access, housewives have the opportunity to obtain more information on a variety of topics, including health, education, and a healthy lifestyle. The higher the knowledge a person has, including housewives, can form better behaviors and lifestyles because they are better able to make informed decisions and are more aware of the importance of maintaining family health and well-being. More than half of the 31 respondents (77.5%) earned <2 million. Family income that is less than the Regency/City Minimum Wage (UMK) or Provincial Minimum Wage (UMP) can have a negative impact on the family's ability to meet the nutritional needs of toddlers. Low incomes can hinder a family's ability to

buy the nutritious food needed for toddlers. This can cause toddlers to not get enough nutritional intake for their optimal growth and development. Income constraints can limit the variety of foods available to low-income families. The results are in accordance with Apriyadi's (2013) theory which states that income has an influence on the family's purchasing power of nutritious foodstuffs. Low income is an obstacle for families to meet the need for healthy food, both in terms of quality and quantity, especially if they have many children. Limited income leads to a lack of accessible food diversity, because with limited money, food options become limited as well.

#### **Mother's Knowledge in Feeding Toddlers Before and After Being Given TKTP Nutrition Education**

The results showed that the average knowledge score before education (pretest) was 10.05, and after education (posttest) increased to 14.35.

Feeding toddlers is influenced by their mother's nutritional knowledge. Maternal nutrition knowledge is one of the factors that has a significant influence on the incidence of stunting. The role of parents, especially a mother, is very important in fulfilling children's nutrition because children need parental attention and support in facing very rapid growth and

development. To get good nutrition in children, good nutritional knowledge from parents is needed in order to provide a balanced menu of food choices. The level of nutrition knowledge of parents has a great influence on attitudes in feeding (Fatimah, 2021).

This is supported by research from Pratiwi (2022) which shows the difference in the influence of education on knowledge of mothers and stunted children using audiovisual and booklet methods and there is an increase in knowledge with p value = 0.000.

#### **Mother's Attitude in Feeding Toddlers Before and After Being Given Nutrition Education at the Crime Scene**

The results showed that the average attitude score before education (pretest) was 37.03, and after education (posttest) increased to 38.98.

Attitude is a response or response that is still hidden from a person to a stimulus or object (Notoatmodjo, 2014). This is supported by research, showing that good feeding is motivated by the mother's attitude in feeding children. The number of respondents who had negative attitudes in this study was closely related to the level of knowledge they had because knowledge is one of the factors that affect attitudes.

After being educated, it can be concluded that some respondents have experienced a change in attitude. This is evidenced by an

increase in attitudes after being given education about TKTP nutrition compared to before being given counseling. This study supports the findings of a study conducted by Zakaria et al. (2013) which shows a change in attitudes before and after getting education. The increase in attitudes observed in respondents can be caused by the increase in knowledge gained during nutrition education sessions using booklet media, as well as the interaction of questions and answers between counselors and respondents.

### **The Effect of TKTP Nutrition Education on Mothers' Knowledge and Attitudes in Feeding Toddlers**

The results of data analysis using the paired t-test to assess the mother's knowledge and attitude in providing food to toddlers showed a significance value of  $p = 0.000$  ( $p < 0.05$ ). This indicates that nutrition education has a significant influence on increasing the knowledge and attitude of mothers in providing food to toddlers.

Providing nutrition education can increase mothers' knowledge and attitudes in fulfilling nutrition that can improve the nutritional status of children. Nutrition education is a combination of educational strategies with environmental support and is designed so that the target can choose food and actions related to health and well-

being. Nutrition education can also be interpreted as one of the parts of health and welfare promotion. Nutrition education can also be interpreted as one of the parts of health promotion in education, health education aims to improve or shape health behaviors (Notoatmojo, 2014).

The more information the mother gets and the more knowledge about feeding, the better the mother's attitude in feeding the mother to the child 24-59 months. The level of knowledge of mothers about feeding affects the mother's attitude in choosing the food that the mother gives to her child. The good nutritional knowledge that mothers have is expected to affect the consumption of good food for their children. This is able to improve nutritional status for the better. Maternal nutrition knowledge has an important role in shaping children's eating habits. Counseling provided to mothers can improve mothers' attitudes in feeding their children (Banowo & Hidayat, 2021).

The increase in height or body length in toddlers is more influenced by the provision of food or nutrients for a long period of time. Toddlers who do not get food or macro or micro nutrients that are consistent with their needs continuously, eat their height or body length is abnormal or short.

This research is in line with research conducted by Yauma (2019), on "the effect of nutrition education on maternal knowledge and attitudes in feeding stunted children in the 2019 Cold Air Health Center Working Area". The study concluded that there was an increase in maternal knowledge and nutritional status of toddlers before and after counseling. The results of univariate and bivariate analysis using SPSS with a 95% confidence level showed that there was an increase and change in knowledge scores and maternal attitudes related to feeding stunted children after participating in nutrition education. Significant differences were found between knowledge and maternal attitudes after education using the booklet media group discussion method and leaflet media counseling ( $p < 0.05$ ).

## CONCLUSION

There is an influence of knowledge and attitude after being given education with the results of a statistical test with a value of  $\rho = 0.000$

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