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Original Research

The Influence of Knowledge, Attitudes, and Maternal Age on the Incidence of Stunting of Toddlers Aged 1-5 Years

Agus Purnama Sari [1*], Siti Khadijah[2]

[1] Department of Midwifery, Faculty of Health Sciences, University of Borneo, Tarakan
[2] Department of Nursing Poltekkes Kemenkes Surakarta, Indonesia

ABSTRACT

Background: *During the toddler stage, which is an important phase in human growth, the fulfillment of balanced nutrition is essential. With short height due to long-term malnutrition, stunting is a chronic nutritional problem that is influenced by socioeconomic factors, health, and maternal knowledge and conditions. This study aims to analyze and determine the influence of knowledge, attitudes, and maternal age on the incidence of stunting in the work area of the Sebengkok Health Center in 2024.*

Methods: *This research uses a quantitative design with a case-control approach and purposive sampling technique. The sample consists of 102 mothers with children aged 1 to 5 years. The instrument used is a closed questionnaire to assess the mothers' knowledge about stunting, which has been tested for validity (Pearson Product Moment) and reliability (Cronbach's Alpha) with valid and reliable results. Data analysis was conducted using the Chi-Square test to see the relationship between independent variables and the occurrence of stunting in toddlers.*

Results: *A total of 57 mothers have good knowledge and attitudes, whereas 45 mothers have less favorable ones. A total of 52 mothers is aged <20 or >35 years. The Chi-Square test shows a significant influence of knowledge (p=0.005; OR=3.43), maternal age (p=0.003; OR=0.27), and maternal attitudes (p=0.005; OR=3.43) on the incidence of stunting.*

Conclusion: *Knowledge, age, and maternal attitudes have a significant relationship with the incidence of stunting in toddlers in the working area of the Sebengkok Health Center, Tarakan. Efforts to improve these three factors are important in stunting prevention.*

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CONTACT
Agus Purnama Sari
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aguspurnamasari00@gmail.com
Faculty of Health Sciences, Department of Midwifery, University of Borneo, Tarakan Jalan Amal Lama no.1

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INTRODUCTION

Stunting is a chronic nutritional problem characterized by a child's height shorter than the standard age, which is below -2 standard deviation (SD) of the WHO growth curve. Stunting has a serious impact on children's growth and development, ranging from impaired cognitive development and increased risk of disease to low productivity in

adulthood. Therefore, stunting is a priority for handling in Indonesia, including Tarakan City, North Kalimantan (Kemenkes, 2022).

Based on data from the Tarakan City Health Office in 2023, the Sebengkok Health Center is the area with the highest number of stunted toddlers with a total of 141 stunting cases. This indicates the need for a deeper analysis of the factors that cause stunting in the region (Tarakan City Health Office, 2023). Three important factors that are suspected to affect the incidence of stunting are knowledge, attitude, and age of the mother. Feeding children can be influenced by the mother's knowledge and attitudes as well as the support of family and the environment. Mother's knowledge and attitude will affect the food intake in the family, especially children (Sintia, 2024).

Mother's attitude also has an important role in stunting prevention. A positive attitude towards the practice of parenting and fulfilling child nutrition supports the practical application of knowledge. On the other hand, mothers who are passive or indifferent can ignore the importance of child nutrition and hygiene. Ketut et al. (2024) showed that maternal attitudes have a significant relationship with stunting events.

In addition, the age of the mother at childbirth affects the physical and psychological readiness to raise children. Mothers who are too young are at risk of having limited experience and knowledge, while mothers who are too old may face reproductive health problems that affect the condition of the fetus. Research indicates that maternal age is associated with the ability to provide adequate care during the child's developmental period (Jannah et al., 2023).

Clinically, the age of the mother during pregnancy is a crucial factor. Mothers who become pregnant at age 35 tend to face higher health risks, both for themselves and their fetus. This is caused by the physical condition of the mother, who is either not fully mature or beginning to experience a decline in biological function, which in turn affects the nutritional status of the child. Research has found that the age of the mother correlates with the ability to provide proper care during the child's growth period. Based on this, it is important to conduct research on the influence of knowledge, attitudes, and maternal age on the incidence of stunting in toddlers in the Working Area of the Sebengkok Health Center, Tarakan City, as a foundation for targeted intervention and policy-making (Jannah et al., 2023).

This study presents a novelty by simultaneously analyzing three main factors influencing the incidence of stunting in toddlers—namely maternal knowledge, attitudes, and age—specifically in the working area of the Sebengkok Health Center, Tarakan. Unlike previous studies that generally focused on only one or two factors separately, this research comprehensively examines all three. One of the highlights is the inclusion of maternal attitude as an influential factor, which is crucial for the practical application of knowledge, particularly in childcare and nutritional practices.

In addition, this study is unique because it was conducted in an area with the highest number of stunting cases in Tarakan City, according to 2023 data. An interesting finding emerged: mothers within the productive age group (20–35 years) were found to have a higher risk of having stunted children compared to other age groups. This contrasts with earlier research findings and opens opportunities for further investigation into the roles of maternal experience and social support in stunting prevention. The instruments used in this study were also tested for validity and reliability, ensuring that the results are trustworthy and valuable for developing more targeted stunting prevention programs.

MATERIALS AND METHOD

This study employed quantitative design with an observational analytic approach and a case-control study design. This design was chosen because the researchers aimed to determine the influence of maternal knowledge, age, and attitude on the incidence of stunting among toddlers by comparing groups of toddlers who experienced stunting (cases) with those who did not (controls). The case-control approach was considered appropriate for analyzing the effect of independent variables on a health condition that has already occurred.

The population in this study consisted of all toddlers in the working area of the Sebengkok Health Center, totaling 1.059 toddlers. Sampling was conducted using purposive sampling, where respondents were selected based on specific inclusion criteria set by the researchers. The inclusion criteria included mothers with toddlers (aged 0–59 months), residing in the Sebengkok Health Center area, and willing to sign an informed consent form. The exclusion criteria were mothers who refused to participate, children over five years of age, or those not permanently residing in the area. As a result, a total of 102 respondents were included in the sample.

The dependent variable in this study was the incidence of stunting, measured by height or length-for-age using the WHO standard (Z-score < -2 SD). The independent variables included maternal knowledge, age, and attitude. Knowledge and attitude were assessed using a 15-item closed-ended multiple-choice questionnaire. These variables were classified into three categories based on score percentages: good (76–100%), moderate (56–75%), and poor (≤55%). Maternal age was categorized into two groups: at-risk age (<20 years or >35 years) and not at-risk (20–35 years), based on respondent identity data.

The research instrument (questionnaire) underwent validity and reliability testing. Validity was tested using Pearson Product Moment correlation, and the results showed that all items were valid. Reliability was tested using Cronbach's Alpha, with results exceeding 0.60, indicating that the instrument was reliable for use in this study.

Data analysis was conducted in three stages. First, univariate analysis was used to describe the frequency distribution of each variable. Second, bivariate analysis was performed using the Chi-Square test to determine the relationship between independent variables and stunting incidence. Third, multivariate analysis was conducted using multiple logistic regression to assess the simultaneous effect of the independent variables on stunting.

This study met all research ethics requirements. Prior to data collection, ethical approval was obtained from the Ethics Committee, along with permission from the Tarakan City Health Office and the Sebengkok Health Center, under the approval number No. 007/KEPK-FIKES UBT/III/2024. Respondents were also asked to sign an informed consent form to indicate their willingness to participate. The study ensured the confidentiality of participants' personal data and guaranteed that there were no physical or psychological risks involved in the data collection process. All ethical procedures adhered to the principles of autonomy, beneficence, non-maleficence, and justice.

RESULTS

The results of this research are described as follows:

Table 1. Frequency Distribution of Knowledge, Age, and Maternal Attitude (n = 102)

Variable	n	%
Mother's Knowledge		
Less	45	44.1
Good	57	55.9
Total	**102**	**100**
Mother's Age		
< 20 and > 35 years	52	51
20–35 years	50	49
Total	**102**	**100**
Mother's Attitude		
Less	45	44.1
Good	57	55.9
Total	**102**	**100**

Note: n = number of observations; % = percentage

Based on the table, the majority of respondents had good knowledge and attitudes, each accounting for 55.9%, while the remaining 44.1% were categorized as lacking. In terms of age, most mothers were in the at-risk age group—under 20 years old or over 35 years old—comprising 51%, while the remaining 49% were in the healthy reproductive age range of 20–35 years. These findings indicate that although most mothers had good knowledge and attitudes, more than half were in an age group considered at risk in terms of reproductive health and parenting practices, which can influence the nutritional status and growth of children, including the incidence of stunting.

Table 2. The Influence of Mothers' Knowledge on the Incidence of *Stunting* in Toddlers (n = 102)

Variable	Stunting Incidence				Total		*p-value**	OR
	Stunting		Not *Stunting*					
	n	%	n	%	n	%		
Mother's Knowledge								
Less	30	29.4	15	14.7	45	44.1	0.005	3.43
Good	21	20.6	36	35.3	57	55.9		
Mother's Age								
< 20 and > 35 years	18	17.6	34	33.3	52	51.0	0.003	0.27
20–35 years	33	32.4	17	16.7	50	49.0		
Mother's Attitude								
Less	30	29.4	15	14.7	45	44.1	0.005	3.43
Good	21	20.6	36	35.3	57	55.9		

Note: n = number of observations; % = percentage; *the Chi-Square test

Based on the study results, there is a significant relationship between maternal knowledge, attitude, and age with the incidence of stunting among toddlers in the working area of Sebengkok Health Center in 2024. Mothers with good knowledge and attitudes were more likely to have children who were not stunted, with a p-value of 0.005 and an odds ratio (OR) of 3.43, indicating they were 3.43 times more likely to prevent stunting compared to mothers with poor knowledge and attitudes. Meanwhile, in terms of age, mothers who were younger than 20 or older than 35 years were more likely to have non-

stunted children, with a p-value of 0.003 and an OR of 0.27, suggesting that mothers in these age groups had a lower risk (0.27 times) of having stunted children compared to those aged 20–35 years. These findings highlight the importance of improving maternal knowledge and attitudes, as well as the need to pay attention to maternal age groups in efforts to prevent stunting.

DISCUSSION

The results of Tables 1 and 2 show that there is a significant relationship between knowledge and maternal attitudes towards stunting incidence in the working area of the Sebengkok Health Center, Tarakan City; this can be seen from the results of the Chi-Square test obtained. mothers who have good knowledge and attitudes are 3.4 times more likely to prevent stunting than mothers with low knowledge and attitudes.

This is in accordance with the research of Apriani et al. (2023) in the study area of the UPTD Puskesmas, which found a p-value (0.000 < 0.05) of the effect of maternal knowledge on the incidence of stunting in toddlers. Hidayati et al. (2022) in Kepuh Kuncian Village, Waru District, Sidoarjo Regency, and Januarti et al. (2022) in Urban and Rural Areas of Bangkalan Regency found a significant relationship between maternal knowledge and the incidence of stunting in toddlers, and research conducted in Margasari Tegal shows that knowledge has a great influence on food selection and providing nutritious food to toddlers to prevent stunting (Rahmanindar et al., 2023).

Good maternal knowledge is expected to be applied to daily behavior, both in parenting behavior, food selection, and feeding, which can affect the growth and development of toddlers. However, if mothers do not practice it in daily life, it can have a bad impact on the development of toddlers, such as stunting. Knowledge-based on understanding will foster positive actions. Knowledge is closely related to education, where it can be assumed that a person with higher education will also have a wider range of knowledge (Ayu, 2021).

A person's ability to influence actions is known as knowledge. Attitudes and behaviors also affect their ability to assimilate and understand information easily, which can then be interpreted positively and negatively. Knowledge and understanding attitude about stunting is very important because compared to mothers who have strong knowledge, mothers who have less knowledge will put their children at risk of stunting and increase the likelihood of toddlers experiencing stunting by 1.644 times (Notoatmodjo, 2018). Based on this, the author draws a statistical conclusion that the incidence of stunting in toddlers in the Sebengkok Health Center area is significantly influenced by the mother's knowledge and attitude.

The fact is that findings of age calculation and the incidence of stunting mostly occur in mothers of productive age; in fact, more whose children are stunted, which is as much as 32.4%. This finding is quite interesting because many respondents are over 35 years old, which means they have more experience in parenting. The results of bivariate analysis using the Chi-Square test showed a p-value of 0.003, which indicates that there is a significant relationship between maternal age and stunting incidence. An OR value of 0.27 indicates that the older the mother, the smaller the risk of the child experiencing stunting, which is 0.27 times smaller than that of a younger mother.

This research is in line with what was conducted at the UPTD Gunungsitoli Health Center, Alo'oa District by Fatihunnajah and Budiono (2023). The results of the Chi-Square test showed a significant correlation (p-value 0.004 < 0.05) between the research findings and the age of the mother. There is a significant relationship between maternal

age and the incidence of stunting in toddlers. Likewise, research conducted in the coastal area of Tarakan City shows that the age of mothers influences toddlers in the selection and provision of nutritious food to their toddlers (Purnamasari, 2020).

The age of the respondents refers to their age in the previous year. In general, the older a person gets, the more knowledge and experience they have, including in terms of caring for children. In this study, most respondents were over 35 years old (maximum 44 years old) and classified as a risk age group, but they tended to have more experience in childcare. The ideal age for pregnancy is in the range of 20–35 years, while under 20 years or above 35 years is considered risky. Based on the results of the study in the work area of the Sebengkok Health Center, there was a significant relationship between maternal age and the incidence of stunting (p-value = 0.003). The OR value of 0.27 indicates that older mothers have a smaller chance of stunting in children, which is 0.27 times compared to younger mothers. Older mothers tend to have better knowledge and experience, which is very helpful in maintaining the health and nutrition of their children.

This is in line with research conducted in the Tilango Health Center's work area. There is a relationship with the strength of a strong correlation between the level of knowledge of early mothers and the incidence of stunting in the working area of the Tilango health center, with a correlation coefficient-0.673 which means that the higher the level of knowledge of early mothers, the lower the incidence of stunting (Tomahayua et al., 2024). Research conducted by Wanimbo and Wartiningsih (2020) shows that adolescent age is closely related to the incidence of stunting in clowns 7-24 months. So, it can be interpreted that the more mature a person is, along with his level of knowledge in providing and choosing nutritious food for his child.

Research conducted in Kendari shows that the factors of maternal age and maternal education level are significantly related to the incidence of stunting in children under five. The results of the statistical test showed that there was a relationship between the mother's age and the incidence of stunting in children under five, with a p-value = 0.015. Physical growth in adolescent mothers is still ongoing, so there is competition for nutrients between mothers and fetus. As a result, mothers are at risk of carrying an Intrauterine Growth Restriction (IUGR) fetus and giving birth to a child with a BBLR and short (Hasrun, 2024).

This study has important implications for stunting prevention efforts, highlighting the need for a comprehensive approach that simultaneously considers maternal knowledge, attitude, and age. The findings indicate that improving mothers' knowledge and fostering positive attitudes play a significant role in reducing the risk of stunting, even among those in at-risk age groups. Therefore, public health programs should not only focus on nutrition education but also strengthen mothers' parenting attitudes and provide support across different age categories, especially in high-stunting areas such as the Sebengkok Health Center.

However, this study has several limitations. The use of a case-control design may be subject to recall bias, as it relies on self-reported data from respondents. Additionally, the study was conducted in only one health center area, limiting the generalizability of the findings. Other potential factors such as family income, parenting practices, environmental sanitation, and family support were not included in the analysis. Future research is recommended to cover broader populations with a longitudinal design and include additional variables to produce more comprehensive and targeted stunting prevention strategies.

CONCLUSION

Based on the results of the study, the mother's knowledge, mother's age, and maternal attitude significantly affected the incidence of stunting in toddlers in the work area of the Sebengkok Health Center. Mothers who are knowledgeable, are older, and have a positive attitude tend to be able to reduce the risk of their children experiencing stunting. Efforts to improve these three factors are important in stunting prevention. Therefore, it is very important to provide nutrition education that is easy to understand and empower positive attitudes of mothers, especially for young mothers to prevent stunting.

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