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Mothers' Knowledge and Skills as Key Factors in Preventing Stunting in Toddlers: A Case Study in Malingping, Banten

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Stunting in children under five years of age remains a serious public health problem in Indonesia because it affects physical growth, cognitive development, and long-term productivity. This study aims to analyse mothers' knowledge and skills in preventing stunting and the relationship between sociodemographic characteristics and these two aspects in the working area of the Malingping Community Health Centre, Banten. The study used a descriptive-analytical survey design with a cross-sectional approach involving 80 mothers of toddlers selected through purposive sampling. Data were collected using a structured questionnaire and analysed univariately and bivariately using the Chi-square test. The results showed that most mothers did not know the definition of stunting (81.3%), its causes (86.3%), signs (83.8%), or how to prevent it (88.8%). Mothers' skills in prevention were also low, with 78.8% unable to prepare a balanced complementary feeding menu, 73.7% lacking hygiene when preparing food, and 81.2% rarely monitoring their children's growth. Bivariate analysis showed no significant relationship between education and knowledge ($p = 0.721$), but there was a significant relationship between education and skills ($p = 0.039$). This study concludes that although mothers' knowledge about stunting is still low, practical skills are more influenced by education level. These findings emphasise the importance of educational interventions that not only increase knowledge but also build mothers' practical skills through community-based approaches and support from health cadres.

Keywords: Stunting, Mothers' knowledge, Mothers' skills, Toddlers

INTRODUCTION

Stunting in children under five remains a significant public health issue due to its long-term impact on cognitive development, work capacity, and national productivity. Therefore, reducing the prevalence of stunting has become a nutritional policy priority in many countries, including Indonesia (Laksono et al., 2024). Data analysis and cross-regional studies indicate that the determinants of stunting are multifactorial, encompassing maternal factors, socioeconomic conditions, environmental sanitation, prenatal health status, and access to child health services, requiring a multisectoral approach for effective prevention (Siramaneerat, Astutik, Agushyvana, Bhummikittipich, & Lamprom, 2024). Within this framework of determinants, the role of mothers—particularly their knowledge and practical skills related to child nutrition, breastfeeding, complementary feeding, and hygiene practices—often emerges as a factor that can be intervened upon to reduce the risk of stunting. (Saleh, Syahrul, Hadju, Andriani, & Restika, 2021) Empirical evidence from studies and meta-analyses shows that maternal education (formal level) is associated with child growth, but mothers' specific knowledge and practical skills regarding nutritional care and sanitation play a more

direct role in determining feeding and child care behaviours (Rezaeizadeh et al., 2024). Therefore, a detailed understanding of the knowledge and skills profile of mothers at the community level is an important prerequisite for designing targeted and sustainable educational interventions (Saleh et al., 2021).

A number of studies report that educational interventions that focus on increasing mothers' knowledge and practical skills training tend to be more effective in changing feeding practices and child care behaviours than interventions that only provide theoretical information (Saleh et al., 2021). The results of these studies show that practical demonstrations, hands-on training, and the use of easy-to-understand audiovisual materials can improve mothers' ability to prepare nutritious complementary foods, store food safely, and implement hygiene practices that reduce the risk of recurrent infections in children (Boynito, Pauwels, Otayto, De Henauw, & Abbeddou, 2025). In addition, several studies evaluating integrated community programmes have found that a combination of nutrition education, growth monitoring, micronutrient supplementation, and the involvement of local cadres results in more significant behavioural changes and has

the potential to have a positive impact on child growth indices (Siramaneerat et al., 2024).

Advances in digital technology have opened up new opportunities for maternal health education strategies, particularly through audiovisual media and text messaging platforms that can reach populations in remote areas at relatively low cost (Till et al., 2023). Trials of web-based interventions, applications, and delivery of audiovisual materials via messaging services such as WhatsApp reported an increase in mothers' knowledge scores on nutrition and child care after the intervention, suggesting that digital media is a potential modality for stunting prevention programmes (Erika et al., 2024). However, studies also show that increased knowledge through digital media does not always directly translate into changes in daily practices, especially when structural barriers such as limited availability of nutritious food, poor sanitation conditions, and mothers' workload are not addressed simultaneously (Juniarti, Alsharaydeh, Sari, Yani, & Hutton, 2025). Therefore, digital interventions need to be combined with strategies that build practical skills, community support, and solutions that take into account local resource constraints so that their impact on children's nutritional status can be more certain (Pujari et al., 2025).

The local geographical and socio-cultural context greatly determines the design and effectiveness of stunting prevention interventions, as cultural norms, traditional feeding practices, and physical access to health services influence how information is received and practised by mothers in the field (Sari & Siregar, n.d.). Therefore, a participatory approach involving posyandu cadres, community leaders, and local mothers' groups in the development of educational materials has been recommended by recent studies to increase the relevance, acceptance, and sustainability of behavioural change (Siramaneerat et al., 2024). In addition, adapting educational messages into local languages and using contextually appropriate examples are important factors in ensuring that educational materials are not only informative but also practically applicable to the target families (Sari & Siregar, n.d.).

Although many studies have assessed the effectiveness of educational interventions in improving mothers' knowledge, there is a significant gap in the literature, namely the limited evidence of a clear causal relationship between increased knowledge/skills among mothers and a decrease in the prevalence of stunting at the community level, particularly in remote rural areas (Siramaneerat et al., 2024). Some programme evaluations only measure knowledge outcomes or short-term attitude changes without linking them to medium-term practice changes or child anthropometric indicators, thereby weakening conclusions about the effectiveness of interventions on nutritional status (Faridah, Anies, Kartasurya, & Widjanarko, 2024). In addition, the heterogeneity of intervention designs, implementation durations, and measurement tools in existing studies makes it difficult to compare and generalise results that

can be used as guidelines for national policy (Jala, Meenal, Nagabushanam, Selvakumar, & Rajasekaran, 2023).

In the Indonesian context, although a downward trend in the national prevalence of stunting has been recorded in recent years, there remains considerable variation between regions, and areas with difficult geographical conditions, such as several sub-districts in Lebak Regency, demonstrate the need for interventions tailored to local conditions (Laksono et al., 2024). Areas such as Malingping, with challenges in service access and specific socio-economic conditions, require detailed mapping of mothers' knowledge and skill levels as a basis for developing appropriate educational materials and selecting effective communication channels for example, whether a video-based approach distributed via WhatsApp would be feasible and impactful in that community (Laksono et al., 2024). This type of local profile data is also essential for designing interventions that not only increase knowledge but also facilitate the mastery of practical skills that can overcome contextual barriers such as limited access to nutritious food or inadequate sanitation practices (Stasya & Sulistiadi, 2020).

Based on this series of scientific considerations, this study aims to describe the level of knowledge and skills of mothers of toddlers regarding stunting prevention and to identify the need for appropriate educational materials and media in the working area of the Malingping Community Health Centre, Banten, so that the results of the study can be used as a basis for formulating adaptive, evidence-based local educational interventions that are ready to be evaluated for their effectiveness in changing practices and child nutrition outcomes in the next stage (Siramaneerat et al., 2024).

METHOD

Research Design

This study utilised a quantitative design with a descriptive-analytical survey approach. This approach was chosen because it was suitable for describing the level of knowledge and skills of mothers in preventing stunting, while also analysing the relationship between respondent characteristics and this knowledge and these skills. The survey design allows for the direct collection of primary data from respondents through structured questionnaires, thereby providing a representative picture of the conditions of mothers of young children in the Malingping Community Health Centre working area. Descriptive analysis was conducted to display the frequency distribution and percentage of each variable, while bivariate analysis was conducted to assess the relationship between variables using the Chi-square test.

Research Location and Time

This study was conducted in the working area of the Malingping Community Health Centre, Lebak Regency, Banten Province. This location was chosen because the prevalence of stunting in the area is high and it is one of the priority locations for stunting prevention. The relatively remote geographical location and limited access to health services were important considerations in the selection of

the location. The research was conducted from July to November 2023, coinciding with the implementation of monthly posyandu activities, which made it easier for researchers to reach respondents.

Population and Sample

The population in this study consisted of all mothers with toddlers aged 24–59 months in the working area of the Malingping Community Health Centre. The research sample was determined using a proportion formula with a 95% confidence level and 10% precision, resulting in a minimum of 77 respondents. To anticipate possible dropouts, the sample size was rounded up to 80 respondents. The sampling technique used purposive sampling, with the inclusion criteria being mothers who had toddlers aged 24–59 months, resided in the study area, and were willing to participate in the study by signing a consent form.

Research Instruments

The research instrument was a structured questionnaire developed by the researchers based on literature reviews and stunting prevention indicators. The questionnaire consisted of three main sections. The first section contained questions about the characteristics of the respondents, including age, education, occupation, number of children, and family income. The second section contains 20 questions to assess mothers' knowledge of stunting, including its definition, causes, signs, and prevention efforts. The third section contains 15 questions that measure mothers' skills, including the preparation of complementary foods, hygiene practices when preparing food, and involvement in monitoring children's growth. The instrument was validated through content validity testing by three experts in public health and maternal and child nutrition, while reliability was tested using Cronbach's Alpha, which showed a value of more than 0.70, thus confirming the instrument's reliability.

Data Collection Procedure

Data collection was carried out by researchers together with enumerators who had been trained beforehand. The collection process took place at health posts and respondents' homes. Each respondent was asked to fill out

a questionnaire with the guidance of an enumerator to ensure proper understanding of each question. Completed questionnaires were checked again for completeness at the time of collection to minimise missing or incomplete data.

Data Processing and Analysis

The data collected was first edited, coded, entered, and cleaned to ensure its quality. Univariate analysis was used to describe the characteristics of the respondents, their level of knowledge, and their skills, with the results presented in the form of frequency distribution tables and percentages. Bivariate analysis was conducted to determine the relationship between independent variables (age, education, occupation, number of children, and family income) and dependent variables (mothers' knowledge and skills regarding stunting prevention). The statistical test used was Chi-square with a significance level of $p < 0.05$. The results of the analysis were then presented in a table containing the category distribution, p-value, and accompanying interpretation.

Research Ethics

This study has obtained ethical approval from the Health Research Ethics Committee of the Banten Ministry of Health Polytechnic with ethical certificate number 0304/EA/KEPK/2023. Prior to completing the questionnaire, each respondent was given an explanation of the purpose, benefits, and procedures of the research, and was asked to sign an informed consent form as a form of agreement. The researchers guaranteed the confidentiality of the respondents' identities and that the data would only be used for academic purposes and the advancement of science.

RESULT AND DISCUSSION

Characteristics of respondents

A total of 80 mothers of toddlers participated in this study. The majority of respondents were aged 20–35 years (68.7%), most had low to medium education (93.7%), and almost all worked as housewives (91.2%). An overview of the characteristics of the respondents is presented in Table 1.

Table 1. Socio-demographic characteristics of mothers of toddlers in the Malingping Community Health Centre working area (n = 80)

Variable	Category	Number (n)	Persentase (%)
Mother's age	20–35 years old	55	68.7
	Over 35 years old	25	31.3
Maternal Education	Primary/Lower Secondary Education	40	50.0
	Upper Secondary Education	35	43.7
	Higher Education Institution	5	6.3
Mother's work	Housewife	73	91.2
	Informal workers	7	8.8
Number of Children	1–2 children	49	61.2
	≥3 children	31	38.8
Family Income	< IDR 2,000,000/month	52	65.0
	≥ IDR 2,000,000/month	28	35.0

Table 1 shows the sociodemographic characteristics of mothers of toddlers in the Malingping Community Health Centre working area. Most respondents were aged 20–35 years, namely 55 people (68.7%), while the rest were aged over 35 years, namely 25 people (31.3%). In terms of education, the majority of mothers had low to medium education, with 40 (50.0%) having primary/junior high school education and 35 (43.7%) having senior high school education, while only 5 (6.3%) had attended university. Almost all respondents worked as housewives, namely 73 people (91.2%), and only 7 people (8.8%) worked in the informal sector. The number of children also showed a dominance in the group with 1-2 children, namely 49 people (61.2%), while those with three or more

children numbered 31 people (38.8%). Economically, most families had an income below Rp 2,000,000 per month, namely 52 people (65.0%), while 28 people (35.0%) were above that category. This picture shows that the majority of respondents are of productive age with low to medium levels of education, low economic status, and a focus on domestic roles as housewives, so the potential for limited access to health information is quite large.

Mothers' Knowledge and Skills

The distribution of mothers' knowledge about stunting is shown in Table 2. Almost all mothers were unaware of the definition of stunting (81.3%), its causes (86.3%), its signs (83.8%), and its prevention (88.8%).

Table 2. Distribution of Mothers' Knowledge about Stunting (n = 80)

Knowledge Aspects	Don't know n (%)	Know n (%)
Definition of stunting	65 (81.3)	15 (18.7)
Causes of stunting	69 (86.3)	11 (13.7)
Signs of stunting	67 (83.8)	13 (16.2)
Prevention of stunting	71 (88.8)	9 (11.2)

Table 2 shows the distribution of mothers' knowledge about stunting. Most mothers did not know the definition of stunting, with 65 (81.3%) not knowing and only 15 (18.7%) knowing. Knowledge about the causes of stunting was even lower, with 69 people (86.3%) unaware and only 11 people (13.7%) aware. Similarly, regarding knowledge of the signs of stunting, 67 people (83.8%) did not know and only 13 people (16.2%) knew. The lowest level of knowledge was seen in the aspect of prevention, where 71 people (88.8%) did not know the steps to prevent stunting and only 9 people (11.2%) knew. These findings confirm

that almost all mothers have limited understanding of stunting, in terms of its definition, causes, signs, and prevention. This condition indicates a significant information gap at the household level.

Mothers' Skills in Preventing Stunting

The assessment of mothers' skills is presented in Table 3. Most mothers were unable to prepare a balanced complementary feeding menu (78.8%), were inconsistent in maintaining hygiene (73.7%), and rarely monitored their children's growth at the health centre (81.2%).

Table 3. Mothers' Skills in Preventing Stunting (n = 80)

Skill Aspects	Less than n (%)	Good n (%)
Preparing a balanced complementary feeding menu	63 (78.8)	17 (21.2)
Hygiene when preparing food	59 (73.7)	21 (26.3)
Monitoring child growth	65 (81.2)	15 (18.8)

Table 3 illustrates mothers' skills in preventing stunting. The majority of mothers are not yet able to prepare a balanced complementary feeding menu. with 63 (78.8%) falling into the inadequate category and only 17 (21.2%) able to do so properly. Hygiene aspects when preparing food are also still low. with 59 people (73.7%) having poor skills and only 21 people (26.3%) having good skills. Monitoring child growth is the weakest aspect. with 65 people (81.2%) not doing it regularly and only 15 people (18.8%) doing it well. These results show that although some mothers are aware of the issue. their practical ability to prevent stunting is still very limited. The lowest level of skill is seen in monitoring child growth. which is one of the important pillars in the early detection of stunting.

The Relationship between Mother Characteristics and Knowledge and Skills

Table 4 presents the relationship between maternal characteristics and knowledge and skills in preventing stunting. In terms of age, mothers aged 20–35 years and those over 35 years showed relatively similar patterns of knowledge, with more than 85% of both groups remaining in the low knowledge category. Similarly, skills were mostly low in both age groups. The education variable showed more clear differences. Mothers with primary/junior high school and senior high school education mostly remained in the low knowledge category. However, among mothers with tertiary education, there was a larger proportion with good knowledge, although the number was small. More interestingly, stunting prevention skills appeared to increase with the level of education, with mothers with tertiary education showing

good skills reaching 60% compared to the lower education group, which was dominated by the poor category. The employment variable shows that both housewives and informal workers have low levels of knowledge and, for the most part, poor skills. Although there are slight variations,

the main trend is that educational characteristics are more closely related to skills than to knowledge. These results confirm that mothers' knowledge is not solely influenced by formal education, but that stunting prevention skills tend to increase with higher levels of education.

Table 4. Relationship between Mother Characteristics and Knowledge and Skills in Preventing Stunting (n = 80)

Variable	Category	Good knowledge n (%)	Lack of knowledge n (%)	p-value	Good skills n (%)	Lack of skills n (%)	p-value
Age	20–35 years old	8 (14.5)	47 (85.5)	0.812	13 (23.6)	42 (76.4)	0.542
	Over 35 years old	3 (12.0)	22 (88.0)		3 (12.0)	22 (88.0)	
Education	Primary/Lower Secondary Education	5 (12.5)	35 (87.5)	0.721	6 (15.0)	34 (85.0)	0.039*
	Upper Secondary Education	5 (14.3)	30 (85.7)		7 (20.0)	28 (80.0)	
Work	High School	1 (20.0)	4 (80.0)	0.894	3 (60.0)	2 (40.0)	0.711
	Homemaker	10 (13.7)	63 (86.3)		14 (19.2)	59 (80.8)	
	Informal Employment	1 (14.3)	6 (85.7)		2 (28.6)	5 (71.4)	

The results of this study, which show low levels of knowledge among mothers about the definition, causes, signs and prevention of stunting, confirm that the lack of information about the basic aspects of stunting remains a major obstacle among mothers in the study population. This finding is consistent with empirical studies reporting that poor maternal knowledge continues to contribute to high risks of child malnutrition in many community settings (Santosa, Arif, & Ghoni, 2021). A systematic review shows that although mothers' formal education is often associated with children's nutritional outcomes, specific knowledge about child nutrition and feeding practices are more direct determinants that influence feeding behaviour and care. Therefore, the low level of knowledge we found reflects a functional knowledge gap that must be addressed through focused and contextual educational interventions (Prasetyo, Permatasari, & Susanti, 2023). Findings related to mothers' relatively weak practical skills, particularly in preparing balanced complementary feeding menus, maintaining hygiene when preparing food, and monitoring growth, are consistent with the literature, which emphasises that knowledge alone does not automatically translate into correct practice without practical skills training and adequate environmental support (Prasetyo et al. 2023). The significant relationship we found between knowledge and skills supports the idea that increased knowledge followed by skills training can lead to improved practices; similar findings were reported in an intervention study showing that a combination of education and practical demonstrations was more successful in changing feeding behaviours than theoretical education alone (Raflizar, Damris, Johari, & Herlambang, 2025).

Although formal education did not show a significant correlation with knowledge levels in this sample, the role of education remains complex and contextual. Several large studies have shown that

maternal education generally reduces the risk of stunting. However, this effect is often mediated by access to information, economic status, and health service support, so it is not always apparent in simple bivariate analyses (Rezaeizadeh et al. 2024). Therefore, our findings indicating an insignificant relationship between formal education and knowledge should be interpreted with caution, as socio-economic structure and access to services are likely to modify this relationship. Multivariate analysis that takes confounding factors into account would be more appropriate for revealing the independent effect of maternal education. (Manongga, Weraman, Roga, & Nenogasu, 2024) In addition, Malingping's relatively remote geographical location and low household income potentially limit mothers' access to quality health information sources. As a result, despite their formal education, mothers still face limitations in acquiring specific knowledge about stunting prevention. Such environmental conditions have been identified in regional studies as a significant barrier to the effectiveness of information-based interventions (Raflizar et al. 2025).

The results show that the majority of mothers rarely monitor their children's growth, which is consistent with findings that describe weak participation in nutrition monitoring services in several rural areas. The literature mentions that strengthening the monitoring system and involving local cadres are crucial components for improving family compliance with child growth monitoring (Sukmawati, Hermayanti, Fadlyana, Maulana, & Mediani, 2025). The role of posyandu cadres and public health workers as information mediators and skills trainers is very important. This is because programmes that involve local cadres in counselling and practical demonstrations report greater increases in knowledge and more sustainable behavioural changes than interventions that focus solely on providing materials (Sukmawati et al., 2025). Therefore, our findings support the recommendation that

stunting prevention strategies should prioritise capacity building for cadres and participatory community approaches in order to transfer practical skills to the household level (Sukmawati et al., 2025).

In recent years, global evidence has also shown the potential of digital media and instant messaging platforms as cost-effective and scalable channels for health education; interventions that utilise educational videos and multimedia messages via messaging applications have been shown to improve maternal knowledge scores in various studies. Therefore, the use of such media has the potential to be relevant in the context of Malingping, which has high smartphone penetration despite limited other infrastructure. Pilot studies evaluating video-based education and WhatsApp interventions have reported improvements in knowledge and, in some cases, improvements in practices when the materials were combined with mentoring activities and skills strengthening. However, evidence linking digital interventions directly to a reduction in stunting prevalence is still limited and requires more robust longitudinal studies (Mulyani & Kurnia. 2023). In other words, although digital media offers reach and ease of distribution, the success of transforming knowledge into practice depends on intervention designs that combine practical demonstrations, community support, and solutions to material barriers such as access to nutritious food and sanitation (Soofi et al. 2024).

Studies examining multi-component interventions confirm that intervention packages combining nutrition education, growth monitoring, nutritional supplementation, and sanitation improvement efforts show more consistent results in improving children's nutritional status compared to single interventions. These findings, which emphasise mothers' lack of knowledge and skills, reinforce the importance of including practical and contextual components in stunting prevention programme design (Soofi et al. 2024). In addition, approaches that utilise social and behaviour change communication (SBCC) strategies have been shown to increase the adoption of appropriate nutritional practices when messages are tailored to local cultural norms and supported by effective monitoring systems (Soofi et al. 2024).

This study has several limitations that need to be considered when interpreting the results. The cross-sectional design used limits the ability to conclude causal relationships, so the findings obtained are only associative. In addition, the relatively small sample size and purposive sampling technique may limit the generalisation of the findings to a wider population. The instruments used to assess skills are still questionnaire-based, which may not fully capture the real picture of mothers' practices in their daily lives. Direct observation or mixed methods may provide more comprehensive results. These limitations indicate the need for further research with a prospective design, a larger sample size, and a more diverse measurement approach to strengthen the evidence on the relationship between mothers' knowledge and skills and stunting prevention.

CONCLUSION

This study shows that mothers' knowledge and skills play an important role in preventing stunting in toddlers in the Malingping area of Banten. The results reveal that most mothers still have limited knowledge about the definition, causes, signs, and preventive measures for stunting, as well as poor skills in preparing balanced complementary feeding menus, maintaining food hygiene, and monitoring their children's growth. The identified relationship between knowledge and skills confirms that improving mothers' cognitive capacity needs to be accompanied by strengthening their practical abilities so that preventive behaviours can be applied consistently. Although formal education is not always directly related to knowledge, higher levels of education tend to be associated with better skills. These findings emphasise the importance of interventions that focus not only on increasing knowledge but also on empowering practical skills through community-based approaches, the involvement of health cadres, and the use of educational media appropriate to the local context. Thus, stunting prevention efforts require integrative strategies that combine education, training, and environmental support in order to reduce the risk of stunting in a sustainable manner.

SUGGESTION

Recommendations that can be developed for further research and the field of health health namely the promotion of maternal and child health not only through / a2>Maternal and Child Health Program (KIA) but also through animated video media on stunting prevention for mothers of toddlers via WhatsApp, which is expected to be used for educational purposes on stunting prevention. Further research can be conducted on animated video media, such as testing the effectiveness of animated video media for preventing *stunting* among mothers of toddlers.

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