The Influence of Mothers' Knowledge on Stunting Prevention Behavior in Low-Income Communities in Kulon Progo District

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Abstract. Stunting is a public health problem that occurs frequently in low-income families and is closely related to mothers' knowledge and parenting behaviors. This study aims to analyze the effect of mothers' knowledge on stunting prevention behaviors in toddlers in Kulon Progo District. The study design used a quantitative approach with a cross-sectional method and involved 355 mothers who had toddlers with malnutrition or low body weight. Sampling was conducted using purposive sampling. Data were collected through structured questionnaires and analyzed using Partial Least Squares–Structural Equation Modeling (PLS-SEM). The results showed that most mothers had moderate to high knowledge about stunting, and their stunting prevention behaviors were in the adequate to good category. SEM-PLS analysis showed that mothers' knowledge had a positive and significant effect on stunting prevention behaviors ($O = 0.226$; $T = 5.660$; $p = 0.000$). Good knowledge about the definition, causes, impacts, and prevention strategies for stunting was found to improve important practices such as early breastfeeding initiation, adequate complementary feeding, complete immunization, utilization of integrated health service posts (posyandu), care for sick children, and the implementation of clean and healthy living behaviors. This study concludes that knowledge is the main determinant influencing stunting prevention behaviors among mothers, especially in low-income communities. Nutrition education programs, health counseling, and empowerment of posyandu cadres are recommended as effective strategies to improve health literacy and strengthen stunting prevention practices at the family level.

Keywords: Maternal Knowledge, Prevention Behaviors, Stunting, Low-Income Communities.

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1 Introduction

Stunting is a serious global health problem, especially in developing countries, characterized by children's height being below the standard for their age, reflecting chronic malnutrition that has long-term implications for physical and cognitive health (1). This condition not only affects individuals, but also the economic productivity and quality of a nation's human resources (2). In Indonesia, the prevalence of stunting remains a significant challenge, particularly in low-income communities, where access to health information and resources is often limited. This situation is exacerbated by mothers' lack of understanding of proper nutrition practices and the importance of clean and healthy living behaviors, which are directly correlated with the incidence of stunting in toddlers (3). Data in Indonesia shows that the prevalence of stunting among toddlers reaches 11.5% and malnutrition reaches 3.9%, which are indicators of low achievement of the Sustainable Development Goals in the health sector (4).

Globally, according to the WHO (2023), the prevalence of stunting worldwide reached 149.2 million children (22%) in 2020, and although the number decreased to 148.1 million in 2022, the percentage actually increased slightly to 22.3%. In the same year, an estimated 45 million children (6.8%) were underweight and 13.7 million children (2.1%) were severely underweight (severe underweight). Most cases of stunting and malnutrition occur in Asia and Africa. This condition increases the risk of child mortality by up to 12 times, while only one in three children with severe wasting receives treatment (5). This situation reflects the low achievement of Sustainable Development Goals (SDGs) indicators in the health sector and confirms that stunting and malnutrition remain urgent public health issues. (1,6).

Nutritional deficiencies in children, especially during the first 1,000 days of life, can cause permanent cognitive and physical developmental disorders, increase the risk of non-communicable diseases in adulthood, and reduce long-term productivity in adulthood (7). This situation underscores the importance of comprehensive interventions to prevent stunting, particularly those focused on improving the knowledge and behavior of mothers, who play a direct role in ensuring their children's nutrition and health (8). Mothers' knowledge of balanced nutrition, early breastfeeding practices, and regular growth monitoring are crucial factors that determine the nutritional status of toddlers 9). Nutrition knowledge is also an internal factor that encourages behavioral changes in families in providing adequate food and implementing clean and healthy living, thereby significantly influencing the prevention of stunting (10).

Therefore, research on the influence of mothers' knowledge on stunting prevention behaviors in low-income communities is highly relevant for formulating effective intervention strategies. (9,11). This study aims to analyze the relationship between mothers' knowledge levels and the adoption of stunting prevention behaviors in Kulon Progo District, an area with demographic and socioeconomic characteristics that are relevant to the context of the problem. This study specifically explores how mothers' knowledge of important aspects of stunting—from its definition and risks to prevention strategies—influences practices such as early breastfeeding initiation, appropriate complementary feeding, immunization compliance, and utilization of integrated health service posts (posyandu). This approach is expected to provide a comprehensive understanding

of the factors that influence mothers' behavior in preventing stunting and to generate evidence-based policy recommendations for more effective nutrition intervention programs

2 Method

This study used a quantitative design with an analytical survey approach and cross-sectional method to examine the relationship between mothers' knowledge and stunting prevention behaviors. The study was conducted in Kulon Progo District from August to October 2025, an area considered representative of low-income communities. The **study** population included all mothers who had toddlers with malnutrition or low body weight, and 355 respondents were selected using purposive sampling. The inclusion criteria included mothers who had toddlers aged 0–59 months with malnutrition or low body weight, and who were willing to participate in the study after signing an informed consent form.

The research instruments consisted of structured questionnaires to measure mothers' knowledge of stunting and prevention practices, as well as medical records of toddlers to confirm their nutritional status. Data collection was conducted through direct questionnaire completion with the assistance of trained enumerators to ensure data accuracy and consistency. The data obtained were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to evaluate the relationship between the latent variables of mothers' knowledge and stunting prevention behaviors.

3 Results

3.1 Demographics of respondents

Respondent demographic data is presented to provide an overview of the characteristics and basic conditions of the research respondents. This presentation includes frequency and percentage distributions based on age, education level, and occupation of mothers.

Table 1. Demographics of age, education, and occupation of mothers of toddlers

No	Characteristics	N	percentage
1.	Mother's age		
	< 20 years old	11	3,1
	20-35 years old	262	73,8
	> 35 years old	82	23,1
2.	Education		
	No schooling	2	0,6
	Elementary school (SD/equivalent)	18	5,1
	Junior high school (SMP/equivalent)	56	15,8
	Senior high school (SMA/equivalent)	234	65,9
	Higher education	45	12,7

No	Characteristics	N	percentage
3.	Occupation		
	Not working	243	68,5
	Laborer	21	5,9
	Farmer	16	4,5
	Private sector	49	13,8
	Self-employed	26	7,3
4.	Income		
	Below minimum wage (<Rp 2,351,250)	262	73,8
	Minimum wage Rp 2,351,250 - Rp 3,500,000	93	26,2

Source: Primary data 2025

The characteristics of the 355 mothers who participated in this study are described in detail to provide contextual understanding of the respondent population. Most mothers were between 20–35 years old (73.8%), representing the typical reproductive age group, while 23.1% were older than 35 years and only 3.1% were younger than 20 years. In terms of education, the majority had completed senior high school (65.9%), followed by those with junior high school education (15.8%) and higher education (12.7%). Only a small proportion had finished elementary school (5.1%), and 0.6% had never attended school. Regarding occupation, most respondents were not working (68.5%), whereas others were employed in the private sector (13.8%), engaged in self-employment (7.3%), or worked as laborers (5.9%) and farmers (4.5%). In addition, the majority of households (73.8%) reported an income below the regional minimum wage (< Rp 2,351,250), while 26.2% earned within the minimum-wage range of Rp 2,351,250 to Rp 3,500,000. These findings indicate that the respondent group predominantly represents low-income families, aligning with the study's focus on economically vulnerable households.

3.2 Mothers' knowledge and stunting prevention behaviors

Maternal knowledge about stunting is a crucial factor influencing stunting prevention efforts among children under five. Adequate knowledge equips mothers with the understanding needed to identify the causes, risks, and preventive measures of stunting, including appropriate feeding practices and utilization of health services. Meanwhile, stunting prevention behavior reflects the extent to which this knowledge is translated into daily practices such as exclusive breastfeeding, age-appropriate complementary feeding, growth monitoring, and maintaining environmental hygiene. To provide a clearer understanding of the respondents' profiles, the following table presents the distribution of maternal knowledge levels and stunting prevention behaviors.

Table 2. Mothers' knowledge and stunting prevention behaviors

Variabel	N	%
Knowledge about stunting		
High	80	22,5
Moderate	201	56,6

Variabel	N	%
Low	53	14,9
Stunting prevention behavior		
Good	143	40,3
Adequate	162	45,6
Poor	50	14,1

Source: Primary data 2025

The results of the study show the distribution of mothers' knowledge regarding stunting and their stunting prevention behavior. In terms of knowledge about stunting, more than half of the respondents demonstrated a moderate level of knowledge (56.6%), while 22.5% had high knowledge, and 14.9% fell into the low knowledge category. These findings indicate that although a substantial proportion of mothers possess a reasonable understanding of stunting, there remains a significant group with insufficient knowledge, highlighting the need for strengthened education and health promotion efforts.

Regarding stunting prevention behavior, 45.6% of mothers exhibited adequate behavior, followed by 40.3% who demonstrated good preventive practices, while 14.1% were categorized as having poor behavior. This distribution suggests that most mothers are practicing stunting prevention at an adequate to good level; however, the presence of mothers with poor behavior indicates ongoing gaps in behavioral implementation that may affect child nutrition outcomes. Overall, these findings emphasize the importance of improving both knowledge and behavior to enhance stunting prevention efforts in the community.

3.3 The relationship between knowledge and preventive behavior

The relationship between maternal knowledge and stunting prevention behavior was examined using the *Structural Equation Modeling–Partial Least Squares* (SEM-PLS) approach. This analysis provides insight into the strength and direction of the influence between latent variables, assessed through several statistical indicators including the original sample estimate (O), sample mean (M), standard deviation (STDEV), t-statistics, and p-values. The results not only indicate the significance of the relationship but also offer a deeper understanding of how maternal knowledge contributes to shaping stunting prevention behaviors. The following table presents the detailed effect sizes and significance levels generated from the SEM-PLS model.

Table 3. Analysis of the relationship between mothers' knowledge and stunting prevention behaviors

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Pengetahuan → Perilaku	**0.226**	**0.224**	**0.040**	**5.660**	**0.000**

Source: Primary data 2025, analysis of relationships with PLS SEM

The SEM-PLS analysis reveals that maternal knowledge has a positive and significant effect on stunting prevention behavior. The original sample estimate (O = 0.226) indicates that higher levels of knowledge contribute to improved preventive behaviors. This estimate is consistent with the sample mean (M = 0.224) obtained through bootstrapping, demonstrating the stability of the model. The relatively low standard deviation (0.040) further supports the reliability of this path coefficient.

The relationship is statistically significant, as shown by a t-statistic of 5.660, exceeding the critical threshold of 1.96. Additionally, the p-value of 0.000 confirms that the association is highly significant and unlikely due to chance. These findings suggest that increasing maternal knowledge plays an important role in enhancing stunting prevention behaviors among mothers with young children.

4 Discussion

The results of the study indicate that mothers' knowledge has a positive and significant effect on stunting prevention behavior (O = 0.226; p = 0.000). This finding confirms that knowledge is an important foundation in shaping health behavior, in line with the Health Belief Model (HBM) framework, which places knowledge as the initial stimulus that influences perceptions of vulnerability, perceptions of severity, and perceptions of benefits before a person takes appropriate health actions (12). Thus, increasing mothers' knowledge about the definition of stunting, its causes, long-term impacts, and prevention strategies is key to strengthening internal motivation to adopt better stunting prevention behaviors.

The majority of mothers in this study had adequate knowledge, but there were still variations in their specific understanding of nutrition and stunting prevention. These variations were reflected in the differences in mothers' abilities to identify the causes of stunting, understand its consequences, and apply appropriate prevention practices. Regression analysis shows that higher knowledge is consistently associated with better preventive behaviors, including early breastfeeding initiation, timely and appropriate complementary feeding, and completion of basic immunization for toddlers. These findings are supported by research by (13), which states that good knowledge increases mothers' involvement in health posts, growth monitoring, and appropriate practices for caring for sick children.

Previous studies have shown a consistent pattern in which good nutritional knowledge not only improves the quality of diet but also encourages clean and healthy living practices within families (14). The findings in this study reinforce these results by showing that a deep understanding of stunting enables mothers to integrate this information into their daily actions, including maintaining environmental hygiene and ensuring access to nutritious food for toddlers. However, as pointed out by Ariestia in 2020 (15), good knowledge alone does not always guarantee behavioral change because economic and social factors also influence mothers' ability to consistently apply preventive practices. A number of previous studies have also confirmed the crucial role of knowledge as a predictor of stunting prevention behavior. Maku et al. in 2023 (8) found that mothers with good health literacy were better able to implement proper feeding

practices and regularly monitor their children's growth. Dhefiana et al. in 2023 (10) also reported that increased nutritional knowledge correlates with more appropriate complementary feeding practices, thereby reducing the risk of stunting. Dini et al. in 2022 (9) added that knowledge is an important internal determinant in shaping family health behaviors. Even UNICEF in 2022 (5) and WHO in 2023(16) state that mothers' low knowledge of nutrition and child care is one of the root causes of high stunting rates in developing countries.

This study shows that knowledge levels contribute to various aspects of behavior, ranging from breastfeeding and complementary feeding practices to sanitation practices and utilization of health services. This is consistent with the findings of Rokhaidah & Hidayattullah in 2022 (17), which emphasize that comprehensive knowledge about nutrition and health shapes mothers' positive behavior in caring for toddlers. These practices are core components in the prevention of stunting, as recommended by Emilia et al. in 2023(18) and Farhanidiah et al. in 2021(19). However, this study found that socioeconomic constraints remain an important factor affecting the effectiveness of applying this knowledge. Mothers with low incomes tend to experience barriers in accessing nutritious food and health services despite having good knowledge. These findings are in line with Zakaria et al. in 2023(1), who state that knowledge can reduce the impact of poverty, but does not completely eliminate it. Therefore, intervention approaches must be comprehensive, targeting not only knowledge improvement, but also strengthening social and economic support for families.

Effective stunting prevention practices require integration between knowledge, feeding skills, hygiene behaviors, and access to health services. This study confirms that strong knowledge among mothers correlates with safe and effective practices, as found by Siagian & Ramschie in 2024 (7). In addition, formal education levels also support increased knowledge, which ultimately has an impact on children's nutritional status (Kuswanti & Azzahra, 2022). The importance of structured and sustainable nutrition education programs has been proven to increase knowledge and encourage positive behavioral change, as shown in studies by Siampa et al. in 2022 (20) and Kartikawati et al. in 2023 (21). Improving maternal health literacy is a key strategy that must be combined with multisectoral interventions to address structural and socio-economic barriers that hinder the implementation of stunting prevention practices (Huriah et al. in 2020 (22); Paramesti et al., in 2024 (23)

5 Conclusion

This study shows that mothers' knowledge plays a significant role in shaping stunting prevention behaviors among toddlers in low-income communities in Kulon Progo District. Higher levels of knowledge are consistently correlated with better prevention behaviors, as evidenced by a p-value of 0.000, which indicates a highly significant relationship. Mothers' understanding of the definition, causes, impacts, and prevention strategies for stunting has been shown to influence various important practices, including early breastfeeding initiation, adequate complementary feeding, complete immunization, growth monitoring through integrated health service posts (posyandu), care for

sick children, supplementation, and the implementation of clean and healthy living behaviors.

These findings confirm that knowledge is a key determinant in shaping mothers' attitudes and actions related to child care. Therefore, nutrition education programs, health counseling, and empowerment of health center cadres are important strategies for improving mothers' health literacy. Targeted and comprehensive educational interventions need to be further expanded to strengthen stunting prevention practices, especially among socioeconomically vulnerable groups

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