

Overview and Characteristics of Mothers' Knowledge, Attitudes, and Behaviors in Stunting Prevention in the Working Area of Nosarara Public Health Center

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ARTICLE INFO	ABSTRACT
Article History: Received Accepted Published online	<i>Stunting is a condition of failure to thrive due to chronic malnutrition, especially in the first 1,000 days of life. In Palu City, the prevalence of stunted toddlers reached 22.1%, while in the Nosarara Health Center working area the rate was 11.17% (170 toddlers). One of the factors that play a role in preventing stunting is the level of knowledge, attitudes, and behavior of mothers in fulfilling nutrition and parenting. This study aims to determine the description and characteristics of the level of knowledge, attitudes, and behavior of mothers in preventing stunting in the Nosarara Puskesmas working area. This study used a quantitative descriptive design with a cross-sectional approach. The study population was mothers who had toddlers in the Nosarara Health Center working area, with a sample size of 93 people selected using convenience sampling technique. Data collection was done through questionnaires. The results showed that the majority of mothers had a good level of knowledge about stunting prevention (87.1%), positive attitudes (87.1%), and good behavior (86.0%). The dominant age group was 26-35 years old, with higher education (51.6%) and income above the minimum wage (30.1%) as the most groups that had good levels of knowledge, attitudes, and behavior.</i>
Keywords: Knowledge; Attitude; Behavior; Stunting. This is an open access article under the  CC-BY-SA license.	

INTRODUCTION

Stunting is a condition of impaired growth and development in children under five caused by chronic malnutrition, especially during the first 1,000 days of life (HPK).¹ Globally, there are 148.1 million children under the age of five who experience stunting, 45.0 million who are wasted, and 37.0 million who are overweight.²

In Indonesia, the prevalence of stunting in 2023 was recorded at 21.5%, a slight decrease of 0.1% from the previous year's figure of 21.6%. This rate remains above the WHO standard, which is below 20%.³

Central Sulawesi is among the provinces with a stunting prevalence above the national average, ranking 11th with a rate of 27.2%.³ In Palu City, the prevalence of stunted toddlers in 2023 was recorded at 22.1%, while At Nosarara Public Health Center, the prevalence of stunting was 11.17%, with a total of 170 stunted children under five.⁴

A mother's knowledge plays a vital role in stunting prevention. Mothers with low levels of knowledge are at a greater risk of having stunted children compared to those with good knowledge.⁵ Parental attitudes toward stunting prevention develop alongside their level of understanding. Positive

attitudes encourage healthy behaviors, which in turn help prevent stunting.⁶ Similarly, good parenting practices, including providing nutritious food and implementing healthy habits, also contribute to reducing the risk of stunting.⁷

Given the high number of stunted children in the Nosarara Health Center's working area and considering the important role of mothers in prevention efforts, it is necessary to map the levels of knowledge, attitudes, and behaviors of mothers related to stunting prevention.

Such understanding is expected to provide a comprehensive overview of the situation in the field and serve as a foundation for developing more effective intervention programs.

Therefore, the researchers were motivated to conduct a study on the overview and characteristics of mothers' knowledge, attitudes, and behaviors in stunting prevention in the working area of Nosarara Public Health Center.

MATERIAL AND METHOD

Research Design

This study employed a quantitative descriptive research design with a cross-sectional approach. The purpose of this research was to describe and analyze the knowledge, attitudes, and behaviors of mothers in the prevention of stunting.

Time and Place of Research

The research was conducted in the working area of Nosarara Public Health Center, located in Palu City, Central Sulawesi. The study took place during the data collection period determined by the research schedule (specific months can be added if available).

Population and Sample

The population in this study consisted of all mothers who had children aged 0–59 months residing in the working area of Nosarara Health Center. A total of 93 respondents were selected as the sample, using a non-probability sampling technique, specifically the convenience sampling method, where respondents were chosen based on accessibility and willingness to participate.

Data Presentation

Data were collected using a structured questionnaire designed to assess the knowledge, attitudes, and behaviors of mothers regarding stunting prevention. The collected data were analyzed using descriptive statistical analysis and presented in the form of frequency distribution tables and percentages, providing a clear overview of the characteristics of each research variable.

RESULTS AND DISCUSSIONS

Table 1. Distribution of Mothers' Characteristis in the Working Area of Nosarara Public Health Center

Respondent Characteristic	Description (age)	Frequency (f)	Percentage %	Total
Age	18-25	22	23.7%	100%
	26-35	59	63.4%	
	36-45	12	12.9%	
Education Level	Primary Education	15	16.1%	100%
	Secondary Education	30	32.3%	
	Higher Education	48	51.6%	
Income Level	Below Regional Minimum Wage	38	40.9%	100%
	Equal to RMW	27	29.0%	
	Above RMW	28	30.1%	

The majority of respondents were aged 26–35 years, totaling 59 individuals (63.4%). Most respondents had attained a higher education level, with 48 individuals (51.6%). Meanwhile, the income levels of respondents varied, with most being in the below-minimum-wage category, totaling 38 individuals (40.9%). A more detailed frequency distribution for each group is presented in Table 1 above.

Table 2. Distribution of Mothers' Knowledge Level in Stunting Prevention in the Working Area of Nosarara Public Health Center

Mothers' Knowledge Level	Frequency (f)	Percentage %
Good	81	87.1%
Fair	8	8.6%

Poor	4	4.3%
Total	93	100%

Based on Table 2, it can be seen that the majority of mothers had good knowledge about stunting, with 81 respondents (87.1%). Meanwhile, 8 respondents (8.6%) had fair knowledge, and 4 respondents (4.3%) had poor knowledge regarding stunting prevention.

Table 3. Distribution of Mothers' Attitudes in Stunting Prevention in the Working Area of Nosarara Public Health Center

Mothers' Attitude	Frequency (f)	Percentage %
Good	81	87.1
Fair	12	12.9
Poor	-	-

Based on Table 3, it can be seen that the majority of mothers had a good attitude toward stunting prevention, with 81 respondents (87.1%). Meanwhile, 12 respondents (12.9%) had a fair attitude toward stunting prevention in the working area of Nosarara Public Health Center.

Table 4. Distribution of Mothers' Behavior in Stunting Prevention in the Working Area of Nosarara Public Health Center

Mothers' Behavior	Frequency (f)	Percentage %
Good	80	86.0
Fair	13	14.0
Poor	-	-

Based on Table 4, it can be seen that the majority of respondents demonstrated good behavior in stunting prevention, with 80 respondents (86.0%). Meanwhile, 13 respondents (14.0%) exhibited fair behavior toward stunting prevention in the working area of Nosarara Public Health Center.

Table 5. Disribution of Mothers' Knowledge Level in Stunting Prevention Based on Age in the Working Area of Nosarara Public Health Center

Age (Years)	Good n (%)	Fair n (%)	Poor n (%)	Total
18-25	19 (20.4)	2 (2.2)	1 (1.1)	22 (23.7)
26-35	55 (59.1)	2 (2.2)	2 (2.2)	59 (63.4)
36-45	7 (7.5)	4 (4.3)	1 (1.1)	12 (12.9)
Total	81 (87.1)	8 (8.6)	4 (4.3)	93 (100)

Based on Table 5, regarding the level of mothers' knowledge by age, the highest proportion of good knowledge was found in the 26–35-year-old group, totaling 55 respondents (59.1%), which also represents the largest age group in this study. This was followed by the 18–25-year-old group with 19 respondents (20.4%), and the 36–45-year-old group with 7 respondents (7.5%), all of whom also demonstrated good knowledge.

Meanwhile, 8 respondents (8.6%) had a fair level of knowledge. Among them, 2 respondents (2.2%) were in the 18–25-year-old group and 2 respondents (2.2%) were in the 26–35-year-old group.

In the poor knowledge category, 1 respondent (1.1%) was in the 18–25-year-old group, 2 respondents (2.2%) were in the 26–35-year-old group, and 1 respondent (1.1%) was in the 36–45-year-old group.

Table 6. Distribution of Mothers' Attitudes Toward Stunting Prevention Based on Age in the Working Area of Nosarara Public Health Center

Age (Years)	Good n (%)	Fair n (%)	Poor n (%)	Total
18-25	19 (20.4)	3 (3.2)	1 (1.1)	22 (23.7)
26-35	55 (59.1)	4 (4.3)	2 (2.2)	59 (63.4)

36-45	7 (7.5)	5 (5.4)	1 (1.1)	12 (12.9)
Total	81 (87.1)	8 (8.6)	12 (12.9)	93 (100)

Based on Table 6, regarding mothers' attitudes toward stunting prevention by age group, the largest proportion of good attitudes was found among mothers aged 26–35 years, with 55 respondents (59.1%), followed by those aged 18–25 years with 19 respondents (20.4%), and the 36–45-year-old group with 7 respondents (7.5%).

Meanwhile, fair attitudes were found in 3 respondents (3.2%) aged 18–25 years, 4 respondents (4.3%) aged 26–35 years, and 5 respondents (5.4%) aged 36–45 years. No respondents were found to have poor attitudes toward stunting prevention.

Table 7. Distribution of Mothers' Behavior in Stunting Prevention Based on Age in the Working Area of Nosarara Public Health Center

Age (Years)	Good n (%)	Fair n (%)	Poor n (%)	Total
18-25	19 (20.4)	3 (3.2)	-	22 (23.7)
26-35	54 (58.1)	5 (5.4)	-	59 (63.4)
36-45	7 (7.5)	5 (5.4)	-	12 (12.9)
Total	80 (86.0)	13 (14.0)	-	93 (100)

Based on Table 7, regarding mothers' behavior toward stunting prevention by age, it can be seen that the majority of mothers aged 26–35 years demonstrated good behavior, with 54 respondents (58.1%), followed by 19 respondents (20.4%) aged 18–25 years, and 7 respondents (7.5%) aged 36–45 years.

In addition, fair behavior was found among 3 respondents (3.2%) aged 18–25 years, 5 respondents (5.4%) aged 26–35 years, and 5

respondents (5.4%) aged 36–45 years. Meanwhile, no respondents were found to have poor behavior in stunting prevention.

Table 8. Distribution of Mothers' Knowledge Level in Stunting Prevention Based on Education Level in the Working Area of Nosarara Public Health Center

Education Level	Good n (%)	Fair n (%)	Poor n (%)	Total
Primary Education	5 (5.4)	6 (6.5)	4 (4.3)	15 (16.1)
Secondary Education	28 (30.1)	2 (2.2)	-	30 (32.3)
Higher Education	48 (51.6)	-	-	48 (51.6)
Total	81 (87.1)	8 (8.6)	4 (4.3)	93 (100)

Based on Table 8, the highest proportion of mothers with good knowledge about stunting prevention was found among those with higher education, totaling 48 respondents (51.6%). Mothers with secondary education also showed a relatively good understanding, with 28 respondents (30.1%) classified as having good knowledge. In contrast, mothers with primary education represented the majority of those with fair (6 respondents, 6.5%) and poor (4 respondents, 4.3%) levels of knowledge. These findings suggest that education level strongly influences mothers' understanding of stunting prevention — the higher the education level, the better the knowledge and awareness regarding stunting prevention.

Table 9. Distribution of Mothers' Attitudes Toward Stunting Prevention Based on Education Level in the Working Area of Nosarara Public Health Center

Education Level	Good n (%)	Fair n (%)	Poor n (%)	Total
Primary Education	5 (5.4)	10 (10.8)	-	15 (16.1)
Secondary Education	28 (30.1)	2 (2.2)	-	30 (32.3)

Higher Education	48 (51.6)	-	-	48 (51.6)
Total	81 (87.1)	12 (12.9)	-	93 (100)

Based on Table 9, regarding mothers' attitudes toward stunting prevention by education level, it can be seen that overall, mothers with higher education showed the highest proportion of good attitudes, totaling 48 respondents (51.6%), followed by 28 respondents (30.1%) with secondary education, and 5 respondents (5.4%) with primary education.

Meanwhile, fair attitudes were more frequently observed among mothers with lower education levels, namely 10 respondents (10.8%) with primary education and 2 respondents (2.2%) with secondary education. These findings suggest that a higher education level contributes to more positive attitudes toward stunting prevention efforts among mothers.

Table 10. Distribution of Mothers' Behavior in Stunting Prevention Based on Education Level in the Working Area of Nosarara Public Health Center

Education Level	Good n (%)	Fair n (%)	Poor n (%)	Total
Primary Education	5 (5.4)	10 (10.8)	-	15 (16.1)
Secondary Education	28 (30.1)	2 (2.2)	-	30 (32.3)
Higher Education	47 (50.5)	1 (1.1)	-	48 (51.6)
Total	81 (87.1)	12 (12.9)	-	93 (100)

Based on Table 10, regarding mothers' behavior in stunting prevention by education level, it can be seen that overall, mothers with higher education demonstrated the highest proportion of good behavior, totaling 47 respondents (50.5%), followed by 28 respondents (30.1%) with secondary education,

and 5 respondents (5.4%) with primary education.

Meanwhile, fair behavior was more frequently observed among mothers with lower education levels, namely 10 respondents (10.8%) with primary education, followed by 2 respondents (2.2%) with secondary education, and 1 respondent (1.1%) with higher education. These results indicate that education level plays an important role in shaping healthy behaviors, where mothers with higher education tend to apply better stunting prevention practices.

Table 11. Distribution of Mothers' Knowledge Level in Stunting Prevention Based on Income in the Working Area of Nosarara Public Health Center

Income Level	Good n (%)	Fair n (%)	Poor n (%)	Total
Below Minimum Wage (UMK)	27 (29.0)	7 (7.5)	4 (4.3)	38 (40.9)
Equal to Minimum Wage (UMK)	26 (28.0)	1 (1.1)	-	27 (29.0)
Above Minimum Wage (UMK)	28 (30.1)	-	-	28 (30.1)
Total	81 (87.1)	8 (8.6)	4 (4.3)	93 (100)

Based on Table 11, regarding mothers' knowledge levels in stunting prevention by income group, it can be seen that most respondents with good knowledge came from the above minimum wage (UMK) category, totaling 28 respondents (30.1%), followed closely by those with income below UMK (27 respondents, 29.0%) and income equal to UMK (26 respondents, 28.0%).

Meanwhile, fair knowledge was found among 7 respondents (7.5%) with income below UMK and 1 respondent (1.1%) with income equal to UMK, while poor knowledge was observed only among 4 respondents (4.3%) with income below UMK.

These results suggest that economic status is associated with knowledge levels, where

mothers with higher income tend to have better understanding of stunting prevention compared to those with lower income.

Table 12. Distribution of Mothers' Attitudes Toward Stunting Prevention Based on Income in the Working Area of Nosarara Public Health Center

Income Level	Good n (%)	Fair n (%)	Poor n (%)	Total
Below Minimum Wage (UMK)	27 (29.0)	11 (11.8)	-	38 (40.9)
Equal to Minimum Wage (UMK)	26 (28.0)	1 (1.1)	-	27 (29.0)
Above Minimum Wage (UMK)	28 (30.1)	-	-	28 (30.1)
Total	81 (87.1)	12 (12.9)	-	93 (100)

Based on Table 12, regarding mothers' attitudes toward stunting prevention by income level, it can be seen that overall, mothers with income above the minimum wage (UMK) had the highest proportion of good attitudes, totaling 28 respondents (30.1%). This was followed by mothers with income below UMK with 27 respondents (29.0%), and those with income equal to UMK with 26 respondents (28.0%).

Meanwhile, fair attitudes were most common among mothers with lower income, specifically 11 respondents (11.8%) below UMK and 1 respondent (1.1%) equal to UMK. No respondents were found to have poor attitudes toward stunting prevention.

These findings indicate that economic status may influence mothers' attitudes, where higher income tends to correlate with more positive attitudes toward health and nutrition practices.

Meanwhile, fair attitudes were more commonly found among mothers with income below the minimum wage (UMK), totaling 11 respondents (11.8%), and only 1 respondent

(1.1%) with income equal to the UMK demonstrated a fair attitude.

Table 13. Distribution of Mothers' Behavior in Stunting Prevention Based on Income in the Working Area of Nosarara Public Health Center

Income Level	Good n (%)	Fair n (%)	Poor n (%)	Total
Below Minimum Wage (UMK)	27 (29.0)	11 (11.8)	-	38 (40.9)
Equal to Minimum Wage (UMK)	26 (28.0)	1 (1.1)	-	27 (29.0)
Above Minimum Wage (UMK)	27 (29.0)	1 (1.1)	-	28 (30.1)
Total	80 (86.0)	12 (12.9)	-	93 (100)

Based on Table 13, regarding mothers' behavior in stunting prevention by income level, it can be seen that overall, mothers with income below the minimum wage (UMK) had good behavior totaling 27 respondents (29.0%), followed by those with income equal to UMK with 26 respondents (28.0%), and those with income above UMK with 27 respondents (29.0%).

Meanwhile, fair behavior was more commonly found among mothers with lower income, namely 11 respondents (11.8%) below UMK, 1 respondent (1.1%) with income equal to UMK, and 1 respondent (1.1%) above UMK. No respondents were found to have poor behavior in stunting prevention.

These findings suggest that while income level does not drastically alter behavioral trends, mothers with higher income may have better access to resources that support consistent stunting prevention practices.

DISCUSSION

Mothers' Knowledge in Stunting Prevention

Based on the results presented in Table 2, it was found that the majority of mothers' knowledge regarding stunting prevention in the working area of Nosarara Public Health Center was in the good category (87.1%). Only a small proportion of mothers had fair (8.6%) and poor (4.3%) levels of knowledge. The high level of knowledge among mothers indicates that most respondents already have a sufficient understanding of the concept of stunting.

Mothers' Knowledge in Stunting Prevention Based on Age

According to Table 5, the 26–35-year-old group dominated the good knowledge category (59.1%). This age group is in the productive phase and tends to be more active in seeking information related to child health, making them more receptive to education and health promotion provided by healthcare workers. This finding is consistent with the study by Yulnica and Helriyanti (2023), which showed that a mother's age has a significant effect on her knowledge about stunting in children.

Mothers' Knowledge in Stunting Prevention Based on Education Level

Based on Table 8, mothers with higher education had the highest proportion of good knowledge (51.6%). This finding aligns with the theory that education influences an individual's ability to receive, understand, and apply health information.

A higher education level tends to make it easier for individuals to understand the importance of early stunting prevention efforts. This result also supports the findings of Yulnica and Helriyanti (2023), who stated that the education level of mothers significantly affects their knowledge about stunting in children.⁸

Mothers' Knowledge in Stunting Prevention Based on Family Income

Based on Table 11, all mothers with income above the minimum wage (UMK) demonstrated good knowledge levels, indicating that economic status influences access to health information. Families with better economic conditions tend to have wider access to health facilities, education, and adequate nutrition.

This finding is consistent with the study by Ahnfani et al. (2024), which showed that families with lower socioeconomic status and lower education levels are more likely to have children suffering from stunting.⁹

Mothers' Attitudes Toward Stunting Prevention

According to the results presented in Table 3, most mothers in the Nosarara Public Health Center area exhibited good attitudes toward stunting prevention (87.1%). A small number of mothers showed fair attitudes (12.9%), and none had poor attitudes. This high percentage of positive attitudes indicates that most mothers already understand the importance of stunting prevention practices, such as providing nutritious food, participating in *posyandu* (community health post) activities, and understanding the significance of exclusive breastfeeding and complementary feeding (MP-ASI).

Mothers' Attitudes in Stunting Prevention Based on Age

As shown in Table 6, mothers aged 26–35 years dominated the good attitude category (59.1%). Within this age range, mothers tend to be more focused on their children's growth and development, making them more responsive to child health programs. This finding aligns with the research by Sulbekti & Barni (2023), which stated that as mothers grow older, their thinking patterns and behaviors become more mature, allowing them to make more rational and consistent efforts in preventing stunting.¹⁰

Mothers' Attitudes in Stunting Prevention Based on Education Level

According to Table 9, mothers with higher education had the highest proportion of good

attitudes (51.6%). This reflects that education level contributes to critical thinking skills and better acceptance of health information. Higher education not only enhances theoretical understanding but also helps form positive attitudes in applying knowledge for stunting prevention.

This is consistent with the research by Husnaniyah, Yullyanti, & Rudiansyah (2020), which stated that education level and knowledge of mothers play an important role in shaping attitudes toward stunting prevention.¹¹

Mothers' Attitudes in Stunting Prevention Based on Family Income

Based on Table 12, mothers with income above the minimum wage (UMK) showed the highest proportion of good attitudes (30.1%).

This suggests that economic level may influence mothers' attitudes toward stunting prevention. Mothers with better economic conditions generally have greater access to health information sources and health services, as well as better ability to provide nutritious food for their families. Moreover, improved economic well-being can reduce financial stress, allowing mothers to focus more on nurturing and educating their children effectively to support stunting prevention.

This finding is consistent with Yullyanti (2020), who reported that economic status plays a crucial role in shaping attitudes toward stunting prevention.¹²

Mothers' Behavior in Stunting Prevention

According to the results shown in Table 4, most mothers in the Nosarara Public Health Center area exhibited good behavior (86.0%) in preventing stunting. Only a small portion of mothers demonstrated fair behavior (14.0%), and none showed poor behavior. The high percentage of good behavior indicates that the majority of mothers not only possess good knowledge and attitudes but have also implemented concrete actions to prevent stunting — such as providing nutritious meals, regularly attending *posyandu*, maintaining environmental cleanliness, and giving exclusive breastfeeding and age-appropriate complementary feeding (MP-ASI).

Mothers' Behavior in Stunting Prevention Based on Age

Based on Table 7, the 26–35-year-old group dominated the good behavior category, accounting for 58.1% of respondents. At this age, mothers tend to be more mature in parenting and more responsible for their children's health, resulting in a higher frequency of positive behaviors related to stunting prevention among this group. This finding aligns with the study by Apriana et al. (2024), which reported a significant relationship between maternal age and stunting prevention practices.¹³

Mothers' Behavior in Stunting Prevention Based on Education Level

According to Table 10, mothers with higher education had the highest proportion of good behavior (50.5%). This supports the theory that the higher a person's education level, the better their health-related behaviors. Education not only enhances knowledge but also strengthens beliefs, awareness, and motivation to apply healthy and preventive behaviors against stunting. This finding is consistent with Rahmawati & Agustin (2020), who stated that mothers with higher education level tend to have better knowledge and awareness in stunting prevention, enabling them to implement preventive practices more effectively.¹⁴

Mothers' Behavior in Stunting Prevention Based on Family Income

Based on Table 13, mothers with income below, equal to, and above the minimum wage (UMK) all showed similar proportions of good behavior, each ranging between 28–29%. However, fair behavior was more common among mothers with income below UMK (11.8%).

Although higher income can support better health practices, personal motivation and self-awareness also play significant roles in shaping

preventive behaviors toward stunting. This finding is consistent with Faulziah et al. (2024), who stated that families with lower economic status tend to have limited knowledge and access to health resources, which can affect their ability to engage in optimal stunting prevention behaviors.¹⁵

CONCLUSION

1. The majority of mothers had a good level of knowledge in stunting prevention. The dominant age group was 26–35 years, followed by mothers with higher education and income above the minimum wage (UMK) as the largest group within the good knowledge category.
2. The majority of mothers demonstrated a good attitude toward stunting prevention. The dominant age group was 26–35 years, followed by mothers with higher education and income above the minimum wage (UMK) as the most represented in the good attitude category.
3. The majority of mothers exhibited good behavior in preventing stunting. The dominant age group was 26–35 years, followed by mothers with higher education and income above the minimum wage (UMK) as the largest group within the good behavior category.

AUTHOR CONTRIBUTIONS

Conceptualization, Z.A, A.H., M.Y.; Methodology, Z.A.; Validation, M.Y, M.Y.; Formal Analysis, Z.A.; Investigation, Z.A., Resources, Z.A.; Data Curation, Z.A.; Writing-Original Draft Preparation, Z.A., A.H., and M.Y.; Visualization, Z.A. All authors have read and agreed to the published version of the manuscript.

CONFLICTS OF INTEREST

The authors declares that there is no conflict of interest.

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