

# RISK FACTOR ANALYSIS OF STUNTING IN THE KEMBARAN 1 PUBLIC HEALTH CENTER'S WORKING AREA

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## Abstract

*This study aimed to identify the dominant risk factors contributing to stunting in the working area of the Kembaran 1 Public Health Center, Banyumas Regency, Indonesia. A cross-sectional approach was employed from May to June 2025, involving 130 mothers of stunted children selected through purposive sampling. Data were gathered using a validated and reliable structured questionnaire distributed via Google Forms, which assessed demographics and stunting-related risk factors. Data analysis included univariate and bivariate methods using SPSS version 22 and Pearson chi-square tests to evaluate associations. The results showed that most respondents were housewives with low household income, and a majority of children were male and over two years old. Despite a high prevalence of good maternal knowledge about stunting (65.4%), statistical analysis revealed no significant associations between maternal knowledge and variables such as education level, income, age during pregnancy, nutritional status, breastfeeding duration, or child immunization status ( $p > 0.05$ ). These findings suggest that maternal knowledge alone may not directly influence key determinants of stunting, highlighting the role of structural and environmental factors in shaping outcomes. This study contributes to the growing evidence that comprehensive, multisectoral strategies beyond individual knowledge are needed to effectively address stunting.*

*Keywords: stunting, maternal knowledge, risk factors, public health*

## INTRODUCTION

Stunting is a chronic growth failure in children caused by prolonged nutritional deficiency, clinically identified by height-for-age below the standard (z-score  $< -2$  SD according to WHO standards) (Immawati, 2024). Currently, stunting remains a major challenge in Indonesia, with a national prevalence of 24.4% in 2021 (National Health Development Policy Agency, 2022).

At Kembaran 1 Public Health Center, the stunting prevalence stands at 17.2%, exceeding the maximum target of 14%, with Bantarwuni Village having the highest case rate (23.1%) (Dinas Kesehatan Banyumas, 2024).

Stunting risk factors are multifactorial, encompassing nutritional aspects, maternal and child health, and environmental conditions. Previous studies have identified significant associations between maternal education level, nutritional knowledge, feeding practices, and stunting incidence (Elfrida et al., 2024; Margatot & Yudha, 2024). However, findings at Kembaran 1 Public Health Center reveal a gap between interventions and outcomes. For instance, while 100% of adolescent girls and brides-to-be received Iron-Folic Acid supplements (IFA) and stunting education, only 22.58% of Chronically Energy-Deficient (CED) pregnant women received additional nutritional support. Moreover, Early Initiation of Breastfeeding (EIBF) coverage remains low (29.17%), and 16.67% of infants were born with Low Birth Weight (LBW), both of which are stunting risk factors (Dinas Kesehatan Banyumas, 2024).

Prior research also indicates that maternal knowledge of stunting strongly influences prevention efforts, yet most mothers in certain areas still have limited understanding (Margatot & Yudha, 2024). Other contributing factors include household income, sanitation, and parenting practices (Setiawan et al., 2018). However, these studies have not specifically examined risk factor dynamics in the working area of Kembaran 1 Public Health Center, particularly regarding the effectiveness of implemented specific and sensitive nutrition interventions. Thus, this study aims to analyze dominant stunting risk factors in the region and evaluate gaps between intervention programs and outcomes, providing evidence-based recommendations to accelerate stunting reduction.

## METHODOLOGY

This study utilized a cross-sectional research design conducted from May to June 2025. The study population consisted of mothers with stunted toddlers in the working area of Kembaran 1 Public Health Center, Banyumas Regency, totaling 130 respondents. Sample size calculation used the Lemeshow formula, resulting in a minimum required sample of 96 participants. The sampling method applied was purposive sampling, with assistance from *posyandu* (integrated health service post) cadres. Data collection was carried out using a questionnaire distributed through google forms. The questionnaire included questions on demographic data, risk factors for stunting (such as maternal age at marriage, maternal age during pregnancy, maternal nutritional status during pregnancy, duration of breastfeeding, child immunization status, and maternal knowledge about stunting).

The maternal knowledge questionnaire was adapted from a questionnaire used in the study by Putri et al. (2021), which had been tested for validity and reliability. The validity test results showed that 15 questions had correlation coefficients ( $r$ ) ranging from 0.767 to 0.936, indicating that the items were valid. Five items had correlation coefficients below 0.632; although these items were considered invalid based on the construct validity test, they were retained in this study as they were considered important for assessing knowledge. The reliability test was conducted using Cronbach's Alpha, which yielded a value of 0.896.

Data analysis included univariate analysis to assess the distribution and characteristics of respondents. Bivariate analysis was used to evaluate the relationship between stunting risk factors in mothers considered significant and influential, including the relationship between education level and family income with knowledge of stunting level, maternal knowledge of stunting with nutritional status during pregnancy, maternal age during pregnancy, exclusive

breastfeeding, and immunization status. The variables in this study are on an ordinal scale, therefore, the pearson chi-square test is used to examine the relationship between groups. Data were processed using SPSS software version 22.

## RESULT AND DISCUSSION

### Respondents' Demographic Characteristics and Risk Factors

Table 1. Frequency Distribution of Respondents' Demographic Characteristics and Risk Factors (n=130)

Category	Frequency	Percentage
<b>Village Distribution</b>		
Bantarwuni	9	6.9%
Dukuhwaluh	27	20.8%
Karangsari	15	11.5%
Karangsoka	6	4.6%
Kembaran	14	10.8%
Linggasari	23	17.7%
Purbadana	15	11.5%
Tambaksari Kidul	21	16.2%
<b>Posyandu Attendance</b>		
Always	117	90.0%
Occasionally	13	10.0%
Never	0	0.0%
<b>Child's Gender</b>		
Male	70	53.8%
Female	60	46.2%
<b>Child's Age</b>		
<2 years	41	31.5%
>2 years	89	68.5%
<b>Mother's Education Level</b>		
No Schooling	0	0.0%
Elementary School	18	13.8%
Junior High School	36	27.7%
Senior High School	55	42.3%
College/University	21	16.2%
<b>Occupation</b>		
Housewife	104	80.0%
Civil Servant	1	0.8%
Entrepreneur	5	3.8%
Others	20	15.4%
<b>Household Income</b>		
<1.5 million/month	63	48.5%

1.5 - 2.5 million/month	48	36.9%
2.5 - 3.5 million/month	11	8.5%
>3.5 million/month	8	6.2%
<b>Current Age of Mother</b>		
<18 years	1	0.8%
18 - 25 years	24	18.5%
26 - 35 years	76	58.5%
>35 years	29	22.3%
<b>Mother's Age at Marriage</b>		
<18 years	5	3.8%
18 - 25 years	106	81.5%
26 - 35 years	17	13.1%
>35 years	2	1.5%
<b>Mother's Age at Pregnancy</b>		
<18 years	2	1.5%
18 - 25 years	59	45.4%
26 - 35 years	55	42.3%
>35 years	14	10.8%
<b>Pregnancy Risk Age</b>		
At Risk	16	12.3%
Not At Risk	114	87.7%
<b>BMI of Mother during Pregnancy</b>		
Underweight	6	4.6%
Normal	31	23.8%
Overweight	23	17.7%
Obese I	55	42.3%
Obese II	15	11.5%
<b>Duration of Breastfeeding</b>		
<6 months	7	5.4%
6 - 11 months	7	5.4%
Up to 2 years	116	89.2%
<b>Immunization Status</b>		
Complete	119	91.5%
Incomplete	10	7.7%
Never	1	0.8%
<b>Level of Knowledge about Stunting</b>		
Good	85	65.4%
Adequate	42	32.3%
Poor	3	2.3%

Based on the univariate analysis of 130 respondents from the working area of Kembaran 1 Public Health Center, most children were from Dukuhwaluh (20.8%) and Lingasari (17.7%)

villages, with the majority of mothers consistently attending Posyandu (90%). Slightly more male children (53.8%) were recorded compared to females (46.2%), and most were older than two years (68.5%). Most mothers had completed senior high school (42.3%) and were primarily housewives (80%). Household income was predominantly below IDR 1.5 million (48.5%), with most mothers aged between 26–35 years (58.5%). The majority married and conceived their first child between 18–25 years of age, while only 12.3% experienced pregnancies at a risky age. In terms of nutritional status, Class I obesity was notably high (42.3%), and almost all mothers breastfed until the child was two years old (89.2%). Immunization coverage was also high (91.5%), and most mothers possessed good health knowledge (65.4%). These findings indicate a diverse demographic and behavioral health profile, which warrants further exploration in relation to stunting incidence.

### Correlation between level of education and mothers' level of knowledge about stunting

Table 2. Correlation between level of education and mothers' level of knowledge about stunting (n=130)

Level of Education	Level of knowledge						<i>p Value</i>
	Poor		Adequate		Good		
	n	%	n	%	n	%	
Elementary school	0	0.0%	9	6.9%	9	6.9%	0,551
Junior high school	1	0.8%	10	7.7%	25	19.2%	
Senior high school	2	1.5%	18	13.8%	35	26.9%	
College/university	0	0.0%	5	3.8%	16	12.3%	

Based on Table 2, the researcher found that most mothers with elementary school (SD) education had moderate (6.9%) and good (6.9%) knowledge about stunting. Meanwhile, among mothers with junior high school (SMP) education, there was 1 person (0.8%) who had poor knowledge, while the majority had good knowledge (19.2%). Among mothers with senior high school (SMA) education, 2 people (1.5%) had poor knowledge, and the majority had good knowledge (26.9%). For mothers with a college-level education, the majority also had good knowledge (12.3%).

From the pearson chi-square test results, it was found that there is no relationship between the mother's education level and their knowledge of stunting, based on a p-value of 0.551 ( $p > 0.05$ ). It can be concluded that mothers with elementary, junior high, or senior high school education mostly have good knowledge about stunting. These results are consistent with the study by Yurissetiowati (2022), which also found no relationship between a mother's education level and knowledge related to early detection of stunting. This may be due to the fact that information about stunting is now available not only from formal education but also from various media and activities such as stunting education classes and community health posts (posyandu). In fact, 90% of respondents reported regularly attending posyandu activities, which allows mothers to frequently receive education about stunting

### Correlation between household income and mothers' level of knowledge about stunting

Table 3. Correlation between household income and mothers' level of knowledge about stunting (n=130)

Household Income	Level of knowledge						<i>p Value</i>
	Poor		Adequate		Good		
	n	%	n	%	n	%	
<1.5 million/month	2	1.5%	28	21.5%	33	25.4%	0,131
1.5 - 2.5 million/month	1	0.9%	11	8.5%	36	27.7%	
2.5 - 3.5 million/month	0	0.0%	2	1.5%	9	6.9%	
>3.5 million/month	0	0.0%	1	0.8%	7	5.4%	

Based on Table 3, the researcher found that among mothers with a family income of less than 1.5 million/month, there were 2 individuals with poor knowledge (1.5%) and the majority had good knowledge (25.4%). Among mothers with a family income of 1.5 – 2.5 million/month, 1 person had poor knowledge (0.9%) and the majority had good knowledge (27.7%). For mothers with an income of 2.5 – 3.5 million/month, the majority also had good knowledge (6.9%). Likewise, among mothers with an income of more than 3.5 million/month, the majority had good knowledge (5.4%).

Based on the Pearson chi-square test, the result showed that there was no significant relationship between family income level and the level of knowledge about stunting, with a p-value of 0.131 ( $p > 0.05$ ). It can be concluded that whether the mother has a low or high family income, most of them have good knowledge related to stunting. This result is in line with the study by Hikmah & Fitri (2022), which also found no relationship between family income level and the incidence of stunting. According to the researcher, the lack of correlation indicates that family income, whether low or high, does not necessarily have a direct impact on stunting or the mother's knowledge about stunting, as there are various other influencing factors.

### Correlation between mothers' level of knowledge about stunting and mothers' age at pregnancy

Table 4. Correlation between mothers' level of knowledge about stunting and mothers' age at pregnancy (n=130)

Mothers' Age at Pregnancy	Level of knowledge						<i>p Value</i>
	Poor		Adequate		Good		
	n	%	n	%	n	%	
At Risk	0	0.0%	5	3.8%	11	8.5%	0,795
Not at Risk	3	2.3%	37	28.5%	74	56.9%	

Based on Table 4, the study found that among mothers who were pregnant at a high-risk age, the majority had a good level of knowledge (8.5%). Meanwhile, among mothers who were pregnant at a non-risk age, 3 individuals had a low level of knowledge (2.3%) and the majority had good knowledge (56.9%).

According to the Pearson chi-square test, it was found that there was no significant relationship between mothers' level of knowledge about stunting and their age during pregnancy, with a p-value of 0.131 ( $p > 0.05$ ). It can be concluded that mothers who became pregnant at either high-risk or non-risk ages mostly had good knowledge regarding stunting. This finding is in line with the study by Setyarini & Fitriyani (2024), which also found no correlation between

maternal age and knowledge about stunting. From this study, it can be concluded that having been pregnant at a high-risk age does not necessarily mean the mother has poor knowledge about stunting, as there are many other factors that may lead to pregnancy at a high-risk age, whether too young or too old.

### Correlation between mothers' level of knowledge about stunting and nutritional status of mother during pregnancy

Table 5. Correlation between mothers' level of knowledge about stunting and nutritional status of mother during pregnancy (n=130)

Nutritional Status of Mother During Pregnancy	Level of knowledge						<i>p Value</i>
	Poor		Adequate		Good		
	n	%	n	%	n	%	
Underweight	0	0.0%	3	2.3%	3	2.3%	0,703
Normal	0	0.0%	11	8.5%	20	15.4%	
Overweight	0	0.0%	8	6.2%	15	11.5%	
Obese I	3	2.3%	15	11.5%	37	28.5%	
Obese II	0	0.0%	5	3.8%	10	7.7%	

As shown in Table 5, mothers who had an underweight nutritional status during pregnancy included three individuals (2.3%) with adequate knowledge and another three (2.3%) with good knowledge. Among mothers with a normal nutritional status, 11 (8.5%) had adequate knowledge, while most had good knowledge (15.4%). A similar trend was observed in mothers who were overweight during pregnancy, with the majority showing good knowledge (11.5%). In the obese I category, three mothers (2.3%) had low knowledge, but most still had good knowledge (28.5%). Likewise, among mothers in the obese II group, five (3.8%) had adequate knowledge, and the majority again showed good knowledge (28.5%).

Although there were differences across categories, the Pearson chi-square test showed no significant relationship between maternal nutritional status and knowledge about stunting, with p-value of 0.703 ( $p > 0.05$ ). This indicates that mothers' nutritional status during pregnancy does not seem to influence how much they know about stunting. These findings align with the study by Bayked et al. (2024), which suggests that knowledge regarding stunting and nutrition does not significantly contribute to the nutritional status of pregnant women. Instead, economic factors (such as household income and food accessibility) and environmental conditions (including sanitation and the availability of healthcare facilities) exert a more substantial influence. This phenomenon supports the United Nations International Children's Emergency Fund (UNICEF) framework on the social determinants of health (2020), which posits that individual knowledge is only one of many interacting factors that collectively shape nutritional outcomes.

### Correlation between mothers' level of knowledge about stunting and duration of breastfeeding

Table 6. Correlation between mothers' level of knowledge about stunting and duration of breastfeeding (n=130)



Duration of Breastfeeding	Level of knowledge						<i>p Value</i>
	Poor		Adequate		Good		
	n	%	n	%	n	%	
<6 months	0	0.0%	2	1.5%	5	3.8%	0,234
6 - 11 months	1	0.8%	3	2.3%	3	2.3%	
Up to 2 years	2	1.5%	37	28.5%	77	59.2%	

Table 6 presents data on breastfeeding duration. Most mothers who breastfed for less than six months had either moderate (1.5%) or good (3.8%) knowledge about stunting. In the 6–11 months group, one mother (0.8%) had low knowledge, while three (2.3%) had adequate and another three (2.3%) had good knowledge. Meanwhile, the majority of mothers who breastfed up to two years had good knowledge (59.2%), though two (1.5%) were still found to have low knowledge.

The Pearson chi-square test indicated no statistically significant relationship between breastfeeding duration and mothers' knowledge about stunting with p-value 0.234 ( $p > 0.05$ ). This suggests that how long a mother breastfeeds does not necessarily reflect how well-informed she is about stunting. The absence of a statistically significant relationship between knowledge of stunting and exclusive breastfeeding practices further corroborates the multilevel analysis conducted by Atika et al. (2018) involving eight breastfeeding mothers across 25 primary health centers in Surabaya. Their findings revealed that knowledge about stunting contributed only 9% to the success of exclusive breastfeeding. In contrast, maternal employment status and support from healthcare professionals played more decisive roles. Exclusive breastfeeding practices were positively influenced by the availability of time to breastfeed, as well as support from husbands and extended family members.

### Correlation between mothers' level of knowledge about stunting and childs' immunization status

Table 7. Correlation between mothers' level of knowledge about stunting and childs' immunization status (n=130)

Childs' Immunization Status	Level of knowledge						<i>p Value</i>
	Poor		Adequate		Good		
	n	%	n	%	n	%	
Complete	3	2.3%	39	30.0%	77	59.2%	0,932
Incomplete	0	0.0%	3	2.3%	7	5.4%	
Never	0	0.0%	0	0.0%	1	0.8%	

Based on Table 7, the majority of mothers whose children had complete immunization status were found to have good knowledge about stunting (59.2%). Among those with incomplete immunization, three mothers (2.3%) had an adequate level of knowledge, while most of the others still showed good knowledge (5.4%). There was one mother (0.8%) who had never taken her child for immunization, she demonstrated a high level of knowledge about stunting.

However, the results of the Pearson chi-square test showed no significant association between immunization status and the mother's knowledge about stunting with p-value 0.932 ( $p > 0.05$ ). This finding implies that a mother's knowledge about stunting does not appear to be affected



by whether or not her child has received complete immunizations. The lack of association between stunting knowledge and the completeness of child immunization is consistent with findings from Jusril et al. (2021). Their research emphasized that decisions around childhood immunization are influenced by a broader set of factors, including caregiver awareness, prevailing social norms regarding the importance of immunization, cross-sectoral engagement in immunization programs, the service delivery environment, and the creation of positive experiences for both mothers and children. Barriers to vaccine uptake include misinformation circulated on social media, religious concerns regarding vaccine permissibility (halal–haram status), limited provider knowledge, negative familial or cultural influences, prior adverse experiences, and anxieties about Adverse Events Following Immunization (AEFI). Thus, immunization coverage appears to be more strongly influenced by public perceptions of vaccine importance than by knowledge of stunting itself.

## CONCLUSION

From this study, several conclusions can be drawn. Among the 8 villages within the working area of Kembaran 1 Public Health Center, Dukuhwaluh is the village with the highest number of stunted children. Most of the stunted children are male and over 2 years old. The majority of mothers of stunted children have a senior high school education, are housewives, and have a household income of less than 1.5 million/month. Most of the mothers became pregnant at a non-risk age and had grade I obesity as their nutritional status. The majority of children received breastfeeding until the age of 2 years and received complete immunizations. Most of the mothers also had a good level of knowledge about stunting.

No significant relationship was found between the mothers' knowledge about stunting and their level of education, family income, maternal age at pregnancy, nutritional status, duration of breastfeeding, or immunization status. We recommend that future studies increase the sample size and include a control group (children who are not stunted) in the research.

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## CONFLICT OF INTEREST

In this study, the researcher has no conflict of interest regarding the publication of the research data

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