Original Article

Impact of Household Social Factors on Stunting among Under-Five Children in a Public Health Center: A Cross-Sectional Study

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ABSTRACT

Background: Stunting is a chronic growth disorder in young children characterized by height below age standards and is closely linked to household social conditions. Factors such as parenting practices, maternal education, employment, and family socioeconomic status are believed to influence stunting. However, evidence remains limited regarding which household-level social determinants exert the strongest influence on stunting within primary healthcare settings in Indonesia. This study aimed to analyze the impact of household social factors on stunting among children under five.
Methods: This research employed an observational study with a cross-sectional design. A total of 215 mothers with children under five were selected from a population of 466 using purposive sampling. Data were collected through structured questionnaires. Statistical analysis was conducted using chi-square tests to examine associations and logistic regression to determine the most influential factors.
Results: The findings revealed significant associations between stunting and parenting practice (p = 0.001), maternal education level (p = 0.002), family income (p = 0.001), and complementary feeding practices (p = 0.001). Logistic regression analysis indicated that complementary feeding practices were the most dominant factor influencing stunting, with an Exp(B) value of 12.927.
Conclusion: Stunting among children under five is significantly influenced by household social factors, particularly complementary feeding practices, which play the most critical role. Strengthening nutrition education, promoting appropriate complementary feeding, and enhancing family support programs are strongly recommended to reduce stunting prevalence in the community.

Keywords: Stunting; Child, Preschool; Social Determinants of Health; Complementary Feeding; Parenting.

Implications for Practice:

- Health professionals in primary healthcare settings should integrate structured counseling on appropriate complementary feeding and responsive parenting practices into routine maternal and child health services to support early prevention of stunting.
- Policymakers should strengthen community-based nutrition programs and social support initiatives that address maternal education and household socioeconomic conditions as key determinants influencing child growth outcomes.
- Midwifery education programs should emphasize competency in family-centered nutrition counseling and early stunting

Implications for Practice:

detection to prepare graduates for effective practice in resource-limited settings, particularly in Low- and Middle-Income Countries where household social determinants strongly influence child health.

Introduction

Stunting is a form of physical growth failure in young children, marked by a height that is shorter than the standard for their age. This condition is usually caused by long-term nutritional deficiencies, especially during the child's golden growth period—the first 1,000 days of life, starting from pregnancy until the age of two (Gabain et al., 2023). Stunting not only affects a child's physical growth but also has long-term consequences on cognitive development, learning ability, future productivity, and a higher risk of non-communicable diseases. Therefore, addressing stunting requires more than just medical treatment; it must also tackle the underlying social factors (Tello et al., 2022).

According to data from the World Health Organization (2024), the prevalence of stunting among children under five in Indonesia is recorded at 21.5%. This figure is further supported by the 2023 Indonesian Health Survey, which indicates that the stunting rate among children under five in Indonesia remains notably high (Afifah et al., 2025). In Padangsidimpuan City, the stunting rate is recorded at 26.1%, down from 28.8% the previous year. Although this downward trend shows progress, the still high rate indicates that more attention is needed. Without consistent and integrated prevention efforts, there is a risk that stunting cases could rise again in the future (Riyadi et al., 2025).

One important factor in the occurrence of stunting is the social environment within the household. This environment includes various elements such as parenting practices, education level, employment status, and the family's socioeconomic condition (Hadi et al., 2021). All of these factors are interconnected and contribute to a child's nutrition, hygiene, and access to healthcare services. When a family has limited knowledge and awareness about the nutritional and health needs of their child, the risk of stunting increases significantly (Harahap et al., 2024).

The education level of parents, especially mothers, is one of the strongest social indicators in determining a child's nutritional status. Mothers with low education levels generally have limited access to relevant information about child health and proper nutrition practices (Campos et al., 2021). This leads to a low understanding of the importance of exclusive breastfeeding, introducing balanced complementary foods, and practicing clean and healthy living habits. On the other hand, mothers with higher education levels tend to make better decisions about child care and are more proactive in seeking information and using available health services (Eidelman, 2023).

In addition to education, a family's economic condition also greatly affects the risk of stunting. Low-income families often struggle to consistently provide nutritious food, face difficulties in accessing healthcare services, and may live in poor sanitary conditions. This situation not only lowers the quality of the child's diet but also increases their vulnerability to infections, which can further worsen their nutritional status (Noor et al., 2022). Economic pressure can also disrupt parenting stability, as parents, especially mothers, may need to work long hours, leaving less time and attention for their child's growth and development (Wahyuni & Fitrayuna, 2020).

Parenting within the household is another social aspect that plays an important role in a child's growth and development (Damanik et al., 2020).

Parenting that is unresponsive to a child's basic needs, such as neglecting hygiene, health, and proper nutrition, can increase the risk of stunting. Support from other family members, such as fathers, grandmothers, or grandfathers, also plays a significant role in the effectiveness of child care. Households with good communication and a supportive environment are more likely to provide the conditions needed for optimal child growth and development (Rahmadiyah et al., 2024).

Furthermore, the social conditions within a household also affect a child's emotional stability and psychosocial well-being (Wahyuni & Fitrayuna, 2020). Households facing economic pressure, internal conflict, or low-income family interactions tend to create an environment that is not ideal for a child's growth. In addition, local social and cultural norms can influence parenting habits that may not align with child health guidelines—for example, early weaning, giving inappropriate complementary foods, or food restrictions for mothers and children (Saputri et al., 2022). Considering these various complexities, this study aims to analyze the influence of household social factors on the occurrence of stunting among children under five in the working area of Labuhan Rasoki Public Health Center.

Methods

Study Design

This observational study employed a cross-sectional design to examine household-level social determinants associated with stunting among children under five in the working area of the Labuhan Rasoki Public Health Center, Indonesia. This study followed the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology) reporting guideline for cross-sectional studies to ensure transparent and comprehensive reporting.

Participants

The study population consisted of 466 mothers with children under five years of age. A total of 215 respondents were selected using purposive sampling, which was chosen to ensure the inclusion of eligible participants who met specific characteristics relevant to the study objectives and to facilitate efficient recruitment within the community setting. Inclusion criteria were: (1) mothers with children under five years; (2) residency in the Labuhan Rasoki area for at least six months; (3) willingness to participate; (4) children in good health at the time of data collection; and (5) ability to communicate effectively and complete the questionnaire or participate in interviews. Exclusion criteria included incomplete socioeconomic or child-related data, withdrawal before completion of data collection, and significant cognitive or communication impairments that interfered with participation.

Instruments

The dependent variable was stunting status (stunted/non-stunted), determined based on height-for-age measurements according to WHO growth standards. The independent variables included household social determinants such as maternal education, family income, parenting practices, complementary feeding behavior, and other relevant socioeconomic characteristics.

Data were collected using a structured questionnaire adapted and modified from previously developed and validated instruments measuring household social determinants, parenting practices, and complementary feeding behaviors. The questionnaire included sections on maternal education, family income, parenting practices, feeding behaviors, and other socioeconomic factors relevant to child nutrition and stunting. Content

validity was established through expert review to ensure that each item adequately represented the constructs being measured, consistent with established content validation approaches in family nutrition and stunting-related survey instruments (Ade et al., 2023). The questionnaire was subsequently pilot-tested among respondents with similar characteristics to evaluate clarity, comprehension, and feasibility.

Internal consistency reliability was assessed using Cronbach's alpha, with coefficients ≥ 0.70 considered acceptable, in accordance with reliability standards commonly applied in surveys of feeding practices and social determinants of child nutrition (Andriani et al., 2023). The instrument consisted primarily of closed-ended questions using nominal, ordinal, and Likert-type scales to facilitate standardized and reliable data collection across participants.

Data Collection

Data were collected from mothers of children under five in the working area of the Labuhan Rasoki Public Health Center over a defined data-collection period during the study year. Data collection was conducted at respondents' homes and community health service locations to ensure accessibility and participant comfort. The data were collected by the principal investigator, assisted by trained research assistants who had prior experience in community-based health surveys. Before data collection began, all research assistants received standardized training on the study objectives, questionnaire administration, ethical procedures, and communication techniques to ensure uniform data collection and minimize interviewer bias. Local community health workers acted as field coordinators, facilitating access to households and assisting in identifying eligible participants based on the inclusion criteria. They also helped schedule interviews and supported communication between the research team and the community. Data were obtained through face-to-face interviews using the structured questionnaire after participants provided written informed consent. Each interview lasted approximately 20–30 minutes. The research team regularly supervised the data-collection process and reviewed completed questionnaires daily to ensure completeness and accuracy.

Data Analysis

Data were analyzed using descriptive and inferential statistics with IBM SPSS Statistics version 25 (IBM Corp., Armonk, NY, USA). Chi-square tests were performed to examine bivariate associations between independent variables and stunting status. Variables with statistical or theoretical relevance were subsequently included in a multivariable logistic regression model to identify factors independently associated with stunting. Results were reported as odds ratios (ORs) with 95% confidence intervals (95% CIs) to estimate the strength and precision of associations. Statistical significance was set at $p < 0.05$.

Ethical Considerations

This study received ethical approval from the Health Research Ethics Committee (KEPK) of Universitas Prima Indonesia (No: 021/KEPK/UNPRI/II/2025). It was conducted in accordance with the principles of the Declaration of Helsinki. Written informed consent was obtained from all participants before data collection after providing a clear explanation of the study objectives, procedures, and participants' rights. To ensure confidentiality, all data were anonymized by assigning unique identification codes, and no personal identifiers were recorded in the database. Completed questionnaires and electronic

datasets were securely stored with restricted access limited to the research team, and all information was used solely for research purposes.

Results

Table 1 presents the frequency distribution of respondents' sociodemographic characteristics, household social factors, and child nutritional status among 215 mothers with children under five. Most mothers were aged 28–31 years (31.6%), had completed senior high school (47.0%), and worked as farmers (51.2%). The majority were of Batak ethnicity (88.4%). Regarding household social characteristics, more than half of respondents reported good parenting practices (58.1%), higher educational attainment (59.5%), low household income (55.8%), and good complementary feeding practices (54.0%). In terms of child nutritional status, 60.9% of children were classified as non-stunted, while 39.1% were stunted.

Table 2 summarizes the bivariate associations between household social factors and stunting status. A higher proportion of stunting was observed among children exposed to poor parenting practices (65.6%) compared with those receiving good parenting (20.0%). Similarly, stunting was more common among children of mothers with lower education (51.7%) than higher education (30.5%). Children from low-income households had a greater prevalence of stunting (53.3%) compared to those from higher-income families (21.1%). The highest proportion of stunting occurred among children with poor complementary feeding practices (70.7%), whereas only 12.1% of those with good feeding practices were stunted. All associations were statistically significant ($p < 0.05$).

Table 3 presents the results of a multivariate logistic regression analysis to identify significant factors associated with stunting among children under five. The analysis found that parenting practice was significantly associated with stunting ($p < 0.001$). Children with poor parenting were 5.2 times more likely to be stunted compared to those with good parenting (OR = 5.209; 95% CI: 2.450–11.077). Household income also had a significant effect ($p = 0.003$). Children from low-income families were 3.7 times more likely to be stunted than those from high-income families (OR = 3.676; 95% CI: 1.563–8.644). Complementary feeding practices were the strongest predictor. Poor feeding practices increased the likelihood of stunting by almost 13 times (OR = 12.927; 95% CI: 5.919–28.231; $p < 0.001$). In contrast, mother's education level was not significantly associated with stunting in the multivariate model ($p = 0.833$), indicating that other factors may mediate its influence.

Table 1. Demographic Characteristics of Respondents (n=215)

Characteristic	n	(%)
Age (years)		
24 – 27	52	24.2
28 – 31	68	31.6
32 – 35	67	31.2
36 – 39	22	10.2
40 – 43	6	2.8
Educational		
Junior High School	87	40.5
Senior High School / Equivalent	101	47.0
Diploma/Bachelor's Degree	27	12.6
Occupation		
Housewife	86	40.0
Farmer	110	51.2
Entrepreneur	13	6.0
Contract worker	6	2.8
Ethnicity		
Batak	190	88.4
Javanese	25	11.6
Parenting practice		
Poor	90	41.9
Good	125	58.1
Total	215	100
Mother's education level		
Low	87	40.5
High	128	59.5

Characteristic	n	(%)
Household income		
Low	120	55.8
High	95	44.2
Complementary feeding practice		
Poor	99	46.0
Good	116	54.0
Stunting incidence		
Stunting	84	39.1
Non-stunting	131	60.9
Total	215	100

Table 2. Household Social Factors Associated with Stunting among Children Under Five (n=215)

Household social factors	Stunting incidents in children: Stunting	%	Not-stunting	%	Total	Chi-square (p-value)
Parenting practice						
Poor	59	65.6%	31	34.4%	90	45.617 (p=0.001)
Good	25	20.0%	100	80.0%	125	
Total	84	39.1%	131	60.9%	215	
Mother's education level						
Low	45	51.7%	42	48.3%	87	9.830 (p=0.002)
High	39	30.5%	89	69.5%	128	
Total	84	39.1%	131	60.9%	215	
Household income						
Low	64	53.3%	56	46.7%	120	23.210 (p=0.001)
High	20	21.1%	75	78.9%	95	
Total	84	39.1%	131	60.9%	215	
Complementary feeding practice						
Poor	70	70.7%	29	29.3%	99	77.151 (p=0.001)
Good	14	12.1%	102	87.9%	116	
Total	84	39.1%	131	60.9%	215	

Table 3. Multivariate Analysis of Stunting among Children Under Five

Variable	B	SE	Sig.	Exp(B)	95% CI for Exp(B) Lower	Upper
Parenting practice	1.650	0.385	0.000	5.209	2.450	11,077
Mother's education level	0.086	0.410	0.833	1.090	0.488	2,437
Household income	1.302	0.436	0.003	3.676	1.563	8,644
Complementary feeding practice	2.559	0.399	0.000	12.927	5.919	28,231
Constant	-7.736	1.140	0.000	0.000		

Discussion

Parenting plays a crucial role in the growth and development of children, including the prevention of stunting in children under five. Good parenting involves providing adequate nutrition, maintaining proper hygiene, and offering sufficient mental and emotional stimulation. When parents lack knowledge about balanced nutrition or are unable to provide nutritious food due to financial constraints or limited access to information, the risk of stunting in children increases. Furthermore, neglecting immunization and basic healthcare services can worsen a child's health condition, ultimately affecting

their physical growth and cognitive development (Karuniawati et al., 2025).

On the other hand, responsive and informed parenting can effectively prevent stunting from an early age. Parents who actively seek health information, regularly monitor their child's growth and development, and provide exclusive breastfeeding along with appropriate complementary feeding are more likely to have children with better nutritional status. Education and guidance for parents, especially mothers, play a vital role in reducing stunting rates in the community. Therefore, government and healthcare interventions that focus on improving the quality of parenting can have a significant impact on stunting prevention efforts (Soviyati et al., 2023).

The study results showed that among 90 mothers who reported poor parenting, 65.6% of their children experienced stunting. In contrast, among 125 mothers who reported good parenting, only 20.0% of their children were stunting. Statistical analysis revealed that the calculated chi-square value (45.617) was greater than the critical value (3.841), and the p-value (0.001) was less than the significance level ($\alpha = 0.05$). This indicates that parenting practice has a significant effect on the occurrence of stunting in children. Similarly, previous research also found a significant relationship between parenting practice and stunting, with a p-value of 0.000 ($p < 0.05$). The odds ratio (OR) calculation showed that children who received good parenting were 3.144 times more protected against stunting compared to those who did not (Khoiriyah et al., 2024).

The mother's education level has a significant impact on the occurrence of stunting in children because a mother's knowledge directly influences her decision-making regarding child care and nutrition fulfillment. Mothers with higher education tend to have a better understanding of the importance of proper nutrition, environmental hygiene, and access to healthcare services. They are also more capable of understanding information from healthcare professionals and following health recommendations, such as exclusive breastfeeding, immunizations, and regular monitoring of their child's growth and development (Shodikin et al., 2023).

In contrast, mothers with lower education levels tend to have a limited understanding of their child's nutritional needs, which can lead to inappropriate feeding practices and insufficient developmental stimulation. This increases the risk of stunting because the child's basic needs are not adequately met. Therefore, efforts to raise awareness and provide nutrition education to mothers, especially in areas with high stunting rates, are crucial to breaking the cycle of stunting across generations (Prasetyo et al., 2023).

The study results showed that among 87 mothers with low education levels, 51.7% of their children experienced stunting. In contrast, among 128 mothers with higher education levels, only 20.0% of their children were stunted. Statistical analysis revealed that the calculated chi-square value (9.830) was greater than the critical value (3.841), and the p-value (0.002) was less than the significance level ($\alpha = 0.05$). This indicates that the mother's education level significantly affects the occurrence of stunting in children. This finding is consistent with previous research, which found that out of 134 respondents with only an elementary school education, 67 (50%) had benn stunting children, and 67 (50%) had children who were not stunting. Chi-square analysis in that study yielded a p-value of 0.005 ($p < 0.05$), confirming a significant relationship between mother's education and stunting (Argaw et al., 2022).

Household income is a key socioeconomic factor that significantly influences the occurrence of stunting in children under five. Families with low income often face difficulties in meeting their children's basic needs, especially in providing nutritious food, clean water, sanitation, and access to healthcare services. The inability to provide sufficient and quality food can lead to chronic malnutrition, which is a major cause of stunting in early childhood (Agustin & Rahmawati, 2021). Additionally, low-income families are more vulnerable to unhealthy environmental conditions and have limited access to health education and information. This worsens the situation because parents may lack the knowledge or resources needed to provide optimal care for their children. Therefore, improving household income through economic empowerment programs and social assistance is crucial to reducing stunting rates and enhancing the quality of life for children in the future (Oktavia, 2021).

The study results showed that among 120 mothers with low family income, 53.3% of their children experienced stunting. In contrast, among 95 mothers with high family income, only 21.1% of their children were stunted. Statistical analysis revealed that the calculated chi-square value (23.210) was greater than the critical value (3.841), and the p-value (0.001) was less than the significance level ($\alpha = 0.05$). This indicates that family income has a significant effect on the occurrence of stunting in children. Similarly, previous research found that families of stunting children mostly had incomes below the regional minimum wage, while only 32.1% of families with non-stunting children had incomes below this threshold. Bivariate analysis using the chi-square test showed a significant relationship between family income and stunting, with a p-value of 0.004 and an odds ratio (OR) of 0.178 (95% CI: 0.52 to 0.607). This confirms that family income is related to the risk of stunting (Agustin & Rahmawati, 2021).

Proper complementary feeding practices play a very important role in preventing stunting in young children. Introducing complementary foods at the right time (starting at 6 months old), with the correct frequency, amount, and nutritional quality, helps meet the child's nutritional needs that breast milk alone can no longer fulfill. When complementary feeding is done well, children can grow optimally because they receive enough energy and nutrients for their physical and cognitive development (Wangiyana et al., 2021). On the other hand, improper complementary feeding, such as starting too early or too late, or providing foods with low nutritional value, can lead to chronic malnutrition and eventually cause stunting. Many cases of stunting happen because complementary foods lack proper hygiene, protein, iron, and other important micronutrients. Therefore, educating parents, especially mothers, about the correct complementary feeding practices is very important as a preventive step to reduce stunting rates in the community (Widiastity & Harleli, 2021).

The study showed that among 99 mothers with poor complementary feeding practices, 70.7% of their children experienced stunting. In contrast, among 116 mothers with good complementary feeding practices, only 12.1% of their children were stunted. Statistical analysis found that the chi-square value (77.151) was higher than the critical value (3.841), and the p-value (0.001) was less than 0.05. This means that complementary feeding practices have a significant impact on the occurrence of stunting in children. Unlike previous studies, this research found no link between the timing of introducing complementary foods and stunting at Soropia Public Health Center, with a p-value

of 1.000 ($p > 0.05$). The questionnaire results showed that among 93 respondents, 54 introduced complementary feeding at the right time. Of these, only 2 children (3.7%) were stunting, and 52 (96.3%) were not. Meanwhile, 39 respondents introduced complementary feeding late or early, with 1 child (2.6%) stunting and 38 (97.4%) not stunting. There was no connection between complementary feeding timing and stunting because mothers at Soropia Public Health Center follow the recommended timing, starting complementary feeding after the child is 6 months old. Giving complementary feeding at the right time supports babies' growth, brain development, and healthy eating habits. The good knowledge of mothers in the area explains why most give complementary feeding on time. Early introduction of complementary feeding can affect a child's intelligence later in life and increase the risk of obesity, high blood pressure, and heart disease (Widiastity & Harleli, 2021).

Implications and limitations

The findings of this study contribute to the growing body of knowledge on the social determinants of child stunting by reinforcing the central role of household social environments, particularly complementary feeding practices, parenting behaviors, maternal education, and family income in shaping child growth outcomes. Conceptually, these results strengthen existing theoretical frameworks that position stunting as not merely a biological condition but as a socially constructed health outcome influenced by family structure and caregiving behavior. The strong effect of complementary feeding practices offers important direction for future research to further explore behavioral mechanisms linking household practices with nutritional status. In addition, the findings provide a scientific basis for developing integrated community and policy interventions that address social and behavioral dimensions of child nutrition, thereby supporting evidence-informed health policy development.

This study has several limitations. The cross-sectional design restricts the ability to establish causal relationships between household social factors and stunting. The sample size, although adequate for statistical analysis, was limited to a single health-center catchment area, which may reduce the generalizability of the findings to other regions. Furthermore, time constraints and resource limitations prevented the inclusion of additional variables that may influence stunting. Data were collected through interviews and self-reported questionnaires, which may introduce recall bias and subjective responses, potentially affecting data accuracy and validity. Despite these limitations, the study provides valuable insights into the social context of stunting among young children.

Relevance to Practice

These findings can guide practical actions at the primary healthcare level to reduce stunting. Healthcare workers should routinely screen household risk factors, such as feeding practices, parenting, maternal education, and family income, during growth monitoring visits and provide targeted counseling for at-risk families, including nutrition education and complementary feeding demonstrations. Primary health centers can implement home visits, parent education sessions, and community outreach through health volunteers. Policymakers should integrate these efforts with social and economic support programs to address both behavioral and socioeconomic determinants of stunting.

Conclusion

Household social determinants, including parenting practices, maternal education, family income, and complementary feeding, were significantly associated with stunting among children under five. These findings indicate the need to prioritize nutrition education, improved parenting and feeding practices, and household economic empowerment. Integrated, multisectoral interventions within primary healthcare settings are therefore essential to inform policy and effectively reduce stunting prevalence.

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CrediT Authorship Contributions Statement

Rika Apripan: Conceptualization, Methodology, Investigation, Data curation, Formal analysis, Writing original draft.

Rosmainun: Supervision, Validation, Writing and review & editing.

Nayodi Permayasa: Project administration, Resources, Writing and review & editing

Conflicts of Interest

There is no conflict of interest.

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