
Factors Associated with Stunting in Toddlers in The Ropang District of Sumbawa

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ABSTRACT

Stunting is a critical public health issue that impairs physical and cognitive development in children, particularly in underserved areas. This study aimed to analyze the relationship between parental nutritional knowledge, parenting practices, and feeding patterns with the stunting status of children under five in Ropang Subdistrict, Sumbawa. A cross-sectional design was used, and total sampling was applied to 24 respondents including 12 respondents of mother and 12 respondents of toddlers. This study used a small sample size because it focused on children who were already classified as stunted. Data were collected through structured questionnaires and analyzed using the chi-square test, Likelihood Ratio, and Fisher's Exact Test. The results showed no significant relationship between parents' nutritional knowledge and the stunting status of children ($p = 0.310$). However, there was a significant relationship between parenting practices and stunting ($p = 0.023$), as well as a very strong association between child feeding patterns and stunting status ($p < 0.001$). Children with poor feeding patterns were more likely to experience severe stunting. These findings emphasize the importance of practical parenting strategies and proper feeding behavior in addressing stunting. Effective interventions should therefore focus on improving daily caregiving and feeding practices, rather than relying solely on increasing parental knowledge, to enhance child health outcomes in rural communities.

Keywords: Stunting, Parenting practices, Feeding patterns, and Nutritional knowledge

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INTRODUCTION

Stunting refers to impaired growth in young children resulting from chronic undernutrition, particularly during the critical first 1,000 days of life. It is influenced by multiple factors, including economic status, maternal nutrition during pregnancy, illnesses in infancy, and insufficient nutritional intake for the child⁽¹⁾.

Stunting can lead to delayed growth and brain development in children, increasing the risk of metabolic and degenerative diseases later in life⁽²⁾. The various risk factors associated with stunting in children in Indonesia highlight the need to prioritize nutrition programs by expanding coverage to key determinants such as food insecurity, unsafe drinking water, living in rural areas, and inadequate sanitation⁽³⁾.

An estimated 162 million children under the age of five worldwide experience stunted growth. The majority approximately 75% of these cases are concentrated in South Asia and sub-Saharan Africa. In sub-Saharan Africa, about 40% of children under five are stunted, while South Asia reports a similar figure at 39%. Indonesia, at present, continues to grapple with a significant issue of stunting, indicative of persistent chronic malnutrition (4). A total of 9 million, or more than a third of Indonesia's under-five children, suffer from stunting⁽⁵⁾.

Based on the results of the 2023 Indonesian Nutrition Status Survey (SSGI), the prevalence of stunting in Indonesia reached 21.5% (6) Save The Children, 2024). Furthermore, the prevalence of stunting in NTB in 2022 was recorded at 32.7%, placing it among the 12 priority provinces for the government's stunting intervention efforts in Indonesia. Sumbawa Regency has shown significant progress in reducing stunting prevalence. According to data from the Basic Health Research and SSGI, stunting prevalence in Sumbawa Regency decreased from 31.53% in 2018 to 25.7% in 2023. However, the Sumbawa Regency Government is currently targeting a reduction in stunting rates to 14% by 2024. This indicates that addressing stunting in Sumbawa⁽⁷⁾.

Based on the decision of the Regent of Sumbawa, for the year 2025, Sumbawa Regency has 10 sub-districts that are included in the stunting locus. Ropang Sub-district is one of the areas in Sumbawa Regency that has been included in the stunting locus for three consecutive years. The number of stunting cases in Ropang Sub-district as of January 2025 was recorded at 40 cases. The majority of these cases are concentrated in Lebangkar Village, with 12 cases. Therefore, this location has been selected as the research site⁽⁷⁾.

The urgency of conducting this research lies in the fact that stunting represents a form of growth impairment in children caused by prolonged nutritional deficiencies. It is recognized as a multifaceted public health issue with complex underlying determinants⁽⁸⁾. This is because stunting is related to various health risk factors, which are also most of the objectives of the Sustainable Development Goals (SDGs)⁽⁹⁾. This study focuses on Ropang Subdistrict, which has been one of the locations affected by stunting for the past three years. Ropang Subdistrict actually has good access to education, so the community's level of education is quite good. The same is true for maternal and child health, where the community has very good access to health facilities, supported by regular posyandu activities in every village every month.

Environmental and sanitation conditions in Ropang Subdistrict are already very good, as evidenced by the implementation of STBM in all villages in Ropang Subdistrict. However, stunting rates remain high. Based on these factors, it is concluded that the stunting situation in Ropang Subdistrict is suspected to be caused by poor knowledge of child nutrition, eating patterns, and parenting practices resulting from inadequate parental care in meeting children's nutritional needs.

The research question in this study is what factors are associated with stunting in infants in Ropang Subdistrict. Therefore, the purpose of this study is to identify the factors associated with stunting in infants in Ropang Subdistrict.

METHOD

This study is quantitative research using a cross-sectional approach, where data collection on factors suspected to be related to stunting is conducted simultaneously at one point in time. The primary focus of this study is to identify the relationship between mothers' knowledge of nutrition, dietary patterns, and childcare practices with stunting conditions among infants in the Ropang Sub-district, Sumbawa Regency.

The study was conducted in Lebangkar Village, Ropang Subdistrict, Sumbawa Regency. The research was carried out over a two-month period from June to July 2025. The study involved 12 mothers and 12 their infants who had been identified as stunted. The inclusion criteria for this study were as follows:

- a. Mothers with children aged 6–59 months who were identified as stunted based on height-for-age (HAZ) measurements below -2 SD according to WHO standards;
- b. Residing in Ropang Subdistrict for at least the past year.
- c. Infants aged 6–59 months who have been classified as stunted based on anthropometric measurements and are in good health (not suffering from severe acute illness or comorbidities).

Exclusion criteria include:

- a. Mothers who have children with chronic comorbidities (such as congenital heart disease, tuberculosis, etc.) that affect nutritional status;
- b. Mothers who are unable to communicate effectively (e.g., have language barriers or severe psychological disorders);
- c. Mothers who move residence during the intervention period.

Data collection was conducted through structured interviews using questionnaires. In addition, supporting information was obtained from secondary sources such as child nutrition measurement results through the KIA book. The collected data were then analyzed descriptively (univariate) to examine the characteristics of the respondents and the distribution of each variable. Next, bivariate analysis was performed using the Chi-Square test to determine whether there was a significant relationship between the factors studied and the incidence of stunting. The statistical analysis process was carried out using IBM SPSS software version 29.0.

Table 1. Operational Definitions and Scoring of Variables

Variable	Assessment Indicators	Number of Items	Scoring System	Category and Cut-off
Nutritional Knowledge	Basic knowledge of stunting, importance of nutrition, types of nutritious food, and prevention of	30 items	1 point for each correct answer; 0 for incorrect	Good ($\geq 75\%$ correct answers) Poor ($< 75\%$) (Notoatmodjo, 2010; Sugiyono, 2013; KAP

Variable	Assessment Indicators	Number of Items	Scoring System	Category and Cut-off
	chronic malnutrition in children			approach)
Child Feeding Practices	Types of food, feeding frequency, consumption of staple food, protein, vegetables, and fruits	24 items	4 points for each response in accordance with guidelines	Appropriate ($\geq 75\%$ of maximum score) Inappropriate ($< 75\%$) (Notoatmodjo, 2010, KAP principles)
Parenting Practices	Parenting styles (democratic, authoritarian, permissive) covering hygiene, growth monitoring, posyandu visits, and child feeding practices	23 items	4 points for each recommended practice; 0 if not done	Positive ($\geq 75\%$ of maximum score) Suboptimal ($< 75\%$) (Notoatmodjo, 2010; Sugiyono, 2013; KAP and parenting practice approach)
Stunting Status	Child height-for-age measured using anthropometric standards based on WHO growth chart (Z-score, HAZ)	—	Based on WHO Z-score (TB/U)	Stunted ($-3 \text{ SD} \leq \text{HAZ} < -2 \text{ SD}$) Severely Stunted ($\text{HAZ} < -3 \text{ SD}$) (WHO, 2006; Child Growth Standards)

RESULTS AND DISCUSSIONS

Table 2 shows that this study involved 12 respondents, consisting of 7 males (58.3%) and 5 females (41.7%). Based on parental age, the majority were in the 20–25 age group and over 30 years old, each comprising 5 individuals (41.7%), while the remaining 2 individuals (16.7%) were in the 26–30 age group.

The majority of respondents had a junior high school education, totaling 7 people (58.3%), followed by senior high school education, totaling 3 people (25.0%), and elementary school education, totaling 2 people (16.7%). Based on occupation, most respondents worked as farmers, totaling 8 people (66.7%). Meanwhile, 1 person each (8.3%) worked as housewives, entrepreneurs, unemployed, and other occupations.

Table 2. Descriptive Data of Respondents

Characteristics	Frequency (n)	Percentage (%)
Gender of Toddlers		
Male	7	58.3
Female	5	41.7
Parental Age (years)		
20–25 years	5	41.7
26–30 years	2	16.7
> 30 years	5	41.7
Last Education Level		
Primary School (SD)	2	16.7
Junior High School (SMP)	7	58.3
Senior High School (SMA)	3	25.0
Occupation		
Housewife	1	8.3
Others	1	8.3
Farmer	8	66.7
Unemployed	1	8.3

Characteristics	Frequency (n)	Percentage (%)
Entrepreneur	1	8.3
Nutritional Knowledge Category		
Poor Knowledge	3	25.0
Good Knowledge	9	75.0
Parenting Practice Category		
Suboptimal Parenting	5	41.7
Positive Parenting	7	58.3
Feeding Practice Category		
Inadequate Feeding	5	41.7
Appropriate Feeding	7	58.3
Stunting Category		
Stunted	7	58.3
Severely Stunted	5	41.7
Total	12	100.0

(Source : Primary Data, 2025)

Relationship between Nutritional Knowledge and Stunting Status in Children

The analysis results show no significant relationship between parents' nutritional knowledge and children's stunting status ($\chi^2 = 1.029$; $p = 0.310$). The Likelihood Ratio test also supports these results with a p-value of 0.312, as does the Linear-by-Linear Association test ($p = 0.332$). The Fisher's Exact Test, used because there were 3 cells (75.0%) with expected frequencies less than 5, yielded a p-value of 0.523. The Odds Ratio of 0.250 with a 95% CI range: 0.016 – 3.997 indicates no significant difference in risk between groups with good and poor nutrition knowledge. Thus, this study shows that nutrition knowledge is not a factor associated with determining stunting status in children.

Association Between Parenting Styles and Stunting Status in Children

The analysis results indicate a significant association between parenting styles and stunting status in children ($\chi^2 = 5.182$; $p = 0.023$). The Likelihood Ratio test yielded a p-value of 0.018, and the Linear-by-Linear Association test was also significant ($p = 0.029$). Although Fisher's Exact Test yielded a p-value of 0.072 (two-sided), the one-sided value approached significance ($p = 0.045$). There were 4 cells (100%) with expected frequencies less than 5, so Fisher's interpretation is more appropriate. The Odds Ratio of 0.042 (95% CI: 0.002 – 0.877) indicates that children of parents with good parenting patterns have a much lower likelihood of experiencing stunting.

Relationship between Feeding Practice and Stunting Status in Children

The analysis results show a highly significant relationship between children's dietary patterns and stunting status ($\chi^2 = 12.000$; $p < 0.001$). The Likelihood Ratio test also supports these results with a p-value < 0.001 , as does the Linear-by-Linear Association test ($p < 0.001$). The Fisher's Exact Test, used because all cells (100%) had expected frequencies less than 5, also yielded a significant value ($p = 0.001$). All children with poor dietary patterns experienced severe stunting, while all children with good dietary patterns only experienced mild stunting. These findings indicate the role of dietary patterns in determining the severity of stunting in children. The odds ratio for feeding practices could not be computed due to a perfect separation in

the data. All children with poor feeding practices were severely stunted, while those with good feeding practices were only mildly stunted, indicating a very strong association that limits statistical estimation of risk.

Table 3. Results of Cross-sectional Analysis of Several Variables with Stunting Categories in Children

Variable	χ^2 Value	p-value	OR	95% CI (Lower – Upper)
Nutritional knowledge	1.029	0.310	0.250	0.016 – 3.997
Parenting Practice	5.182	0.023	0.042	0.002 – 0.877
Feeding Practice	12.000	< 0.001	-	-

(Source : Primary Data, 2025)

Research shows in Table 3 that of the three variables studied, the variables of diet and parenting patterns are related to the incidence of stunting in Ropang District, Sumbawa. Meanwhile, the variable of nutritional knowledge is not correlated because, based on field findings, parents actually already have good knowledge but have not yet applied it properly.

Dietary patterns are important habits or practices that can affect a person's health and nutritional status. Feeding children not only meets their nutritional needs, but also teaches them to appreciate and choose healthy foods. Feeding toddlers is the way mothers feed their toddlers with the aim of meeting their nutritional needs and the amount of food they eat⁽¹⁰⁾. The eating patterns of children classified as stunted need to be addressed. Children at risk of stunting often develop unhealthy eating patterns shaped by a range of influences, including social, cultural, religious, economic, and technological factors. Among these, cultural practices and lifestyle choices are the most strongly associated with inadequate dietary habits⁽¹¹⁾. Good balanced nutrition can reduce the incidence of stunting in toddlers aged 36-59 months. An unbalanced intake of nutrients is one of the factors that directly influences stunting⁽¹²⁾.

Field findings indicate that parents do not pay much attention to their children's eating patterns during the complementary feeding period. Three main findings are used as a reference in diagnosing children's eating patterns, namely parental complaints, nutritional status, and the application of feeding rules. Based on these three main findings, eating issues can be classified into inappropriate feeding practices, small eaters, parental misperceptions, and food preferences (picky eaters and selective eaters) . Inappropriate feeding practices are the most common cause of eating pattern issues⁽¹³⁾.

Childcare for toddlers is still carried out entirely by parents or mothers directly. Childcare includes nutritious feeding habits, food sanitation practices, social environment-related care in infant and child feeding practices, and the use of health services for prevention and treatment to support child growth and development⁽¹⁴⁾. Parenting styles play an important role in shaping children's eating habits, which directly influence efforts to prevent stunting. When parenting styles are not supportive, feeding practices often become suboptimal, even though food availability is sufficient⁽¹⁵⁾.

Inappropriate parenting patterns, such as lack of attention or inappropriate approaches by parents, can increase the risk of growth disorders even if the child was previously in good nutritional condition⁽¹⁶⁾. A lack of affection and emotional involvement can also exacerbate this condition. Children raised in environments

with inadequate care are more likely to experience growth impediments⁽¹⁷⁾. The ability of families to provide time, attention, and support to meet the social and psychological needs of children growing up in families is part of parenting⁽¹⁸⁾.

Research findings indicate that parenting styles tend to be permissive in accordance with children's preferences regarding food. Permissive feeding styles involve allowing children freedom to consume food based on their preferences. This is consistent with research conducted by Massardi et al., permissive parenting patterns actually lead to poor nutritional status⁽¹⁹⁾. Children tend to be given freedom in choosing the menu they want without considering the nutritional content for children⁽²⁰⁾.

Mothers' knowledge of nutrition in providing a balanced diet is truly significant for children's growth, especially their physical development and intelligence⁽²¹⁾. However, this study shows that nutritional knowledge is not related to stunting in children. Field findings show that mothers choose to let their children consume foods that are not nutritionally balanced as long as their children eat. This is in line with research conducted by Ni'mah & Muniroh, There is no correlation between the mother's level of knowledge and the incidence of stunting in toddlers⁽²²⁾.

A mother's high level of knowledge does not necessarily ensure that her child will achieve optimal nutritional status. Although mothers with adequate knowledge are expected to translate this understanding into daily practices, actual behavior is shaped by a range of other factors, including socioeconomic conditions, cultural norms, and environmental influences^(22,23).

Research findings show that, overall, cases of stunting in Ropang Subdistrict are caused by poor parenting and poor eating habits in children. According to the nutrition team at the Ropang Community Health Center, parents of children with stunting sometimes leave their children with other people, so that parents cannot control their children's behavior and what they consume every day. Parents do not pay attention to the diversity of foods consumed daily, for example, during complementary feeding, only rice is provided without additional sources of nutrients. Children at toddler age already consume tea, coffee, high-sugar milk, and snacks high in salt and MSG, resulting in insufficient nutrient intake required for children's growth and development.

The implications of this study emphasize factors related to stunting, particularly dietary patterns and parenting practices. These two variables are crucial in designing effective and sustainable interventions. The study results indicate that both variables have a significant association with stunting, making them key focal points in prevention efforts.

Interventions that emphasize improving parenting quality and children's eating habits will be more effective if accompanied by a family- and community-based approach⁽²⁴⁾. Education for parents, especially mothers, on the importance of a balanced diet and how to care for children with love and consistency is greatly needed⁽²⁵⁾.

In addition, raising public awareness of the importance of balanced nutrition and proper care is a strategic step toward reducing the prevalence of stunting in stunting-prone areas⁽²⁶⁾. Adequate nutrition not

only supports physical growth but also children's cognitive development⁽²⁷⁾. Meanwhile, good parenting strengthens children's immune systems, making them more resilient to infections and diseases⁽²⁸⁾.

Ensuring proper maternal nutrition during pregnancy, along with targeted educational programs, plays a vital role in motivating expectant mothers to seek adequate antenatal services benefiting both maternal health and child development. Postpartum, the implementation of appropriate feeding practices, beginning with exclusive breastfeeding for the initial six months and transitioning to timely and suitable complementary foods, is essential to support a child's nutritional needs, growth, and development, while also reducing the risk of infections and growth-related illnesses. In parallel, efforts to improve household income, expand access to clean water, sanitation, and hygiene, and guarantee the availability of safe and nutritious food are fundamental to strengthening overall household food security⁽²⁹⁾.

This study has several limitations that must be acknowledged. First, the sample size was relatively small, involving only 12 stunted children and their mothers. This limited number of respondents may affect the statistical power of the findings and limit their generalizability. However, the selection of participants was intentionally focused on a single high-risk stunting locus to gain contextual and in-depth insights into the specific risk factors contributing to stunting within that community. Although this approach reduces external validity, it enhances the study's relevance to local conditions and supports the development of targeted, community-based interventions.

Future studies are encouraged to involve larger and more heterogeneous populations across multiple regions to validate and strengthen the generalizability of the results. Additionally, the cross-sectional nature of this study restricts the ability to infer causality between variables. Longitudinal research would be beneficial to establish causal relationships over time.

CONCLUSION

The findings of the study indicate that not all factors studied had a significant relationship with stunting in toddlers. Parents' nutritional knowledge did not show a meaningful relationship with their children's stunting status, indicating that knowledge alone is not enough to prevent stunting if it is not accompanied by appropriate practices. Conversely, parenting patterns were found to have a significant association, with good parenting patterns contributing to a reduction in the risk of severe stunting. The strongest associated factor was children's eating patterns. Poor eating patterns were significantly associated with severe stunting, while children with good eating patterns tended to experience only mild stunting. These findings underscore the importance of focusing on the quality of parenting practices and dietary patterns in efforts to prevent and address stunting in infants.

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