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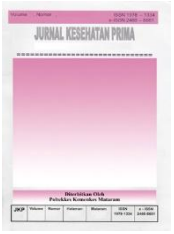

Analyzing the Relationship Between Food Security, Food Taboos, and Stunting Incidence Among Toddlers Aged 24–59 Months

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Abstract
Stunting is a chronic growth disorder characterized by a child's height that is inappropriate for their age. It is caused by prolonged nutritional deficiencies, particularly during the critical growth period of 0–24 months. An increase in stunting among children raises the risk of illness, mortality, weakened immunity, increased infections, and impaired physical and cognitive development. In the short term, stunted children are more susceptible to disease and death, and often experience delays in mental and motor development. Long-term effects include disproportionate growth according to age and an increased risk of obesity, especially among females who are future mothers. According to the 2022 Indonesian Nutritional Status Survey (SSGI), Central Lombok Regency recorded the % stunting prevalence among all regencies/cities in West Nusa Tenggara Province, at 37%.Furthermore, based on the Ministry of National Development Planning (Bappenas) Decree No. KEP.61/M.PPN/HK/08/2024, Central Lombok was designated as a Priority Location (lokus) for stunting prevention due to its high estimated number of stunted children and low coverage of nutritional interventions. This study employed an observational design with a cross-sectional approach. The study population comprised all toddlers in Central Lombok Regency, with a sample of 144 toddlers. Data were analyzed using multivariate tests with SPSS 24 software. Multivariate analysis showed no significant association between food security (p = 0.153; OR = 0.56; 95% CI: 0.252–1.242), sex (p = 0.124; OR = 0.54; 95% CI: 0.255–1.138), and the incidence of stunting among children aged 24–59 months in Central Lombok Regency. Household food security was not significantly associated with stunting among toddlers aged 24–59 months.

Keywords: Household Food Security; Stunting

INTRODUCTION

Stunting is a linear growth disorder (body length/height) that is inappropriate for age and is caused by long-term malnutrition (chronic nutrition). The negative impact on the cognitive and physical development of toddlers in adulthood increases the risk of illness and death rates. It decreases academic achievement and work productivity in the future. Public health indicators are seen from the prevalence of stunting, and the increase in stunting rates is a significant concern in the development of Indonesia's health. (Erika et al., 2024).

Stunting is an under-five growth disorder characterised by height inappropriateness for age. Central Lombok Regency has the highest prevalence of stunting in West Nusa Tenggara at 37% (SSGI, 2022) and is designated as a priority locus for stunting prevention (KEP.61/ M.PPN/ HK/ 08/2024). Households experiencing food insecurity will increase the risk of stunting by 6.7 times. The practice of dietary restrictions inherited in the Sasak culture affects

children's nutritional intake. The early marriage rate in Central Lombok District reached 48.64%, higher than the provincial rate. As many as 24.73% of mothers under five were married at the age of 17, putting them at greater risk of having stunted children

In West Nusa Tenggara Province, the highest prevalence was recorded in Central Lombok Regency (37%), followed by North Lombok Regency (35.9%), East Lombok Regency (35.0%), Dompu Regency (34.5%), and West Lombok Regency (34.0%). Additionally, Bima City, Sumbawa Regency, Bima Regency, Mataram City, and West Sumbawa Regency reported stunting rates of 29.7%, 29.5%, 25.8%, and 13.9%, respectively. Over the four years since 2018, the stunting rate increased to 24.23% (Riskesdas NTB, 2018). According to the Indonesian Nutrition Status Survey (SSGI) 2022, the stunting rate reached 37%, reflecting a 12.77% increase (Ministry of Health of the Republic of Indonesia, 2022).

The high number of stunted children, the elevated prevalence, and the low coverage of intervention efforts have led to Central Lombok Regency being designated as a priority location for integrated stunting prevention in 2025. This designation is based on the Minister of National Development Planning/Head of Bappenas Decree No. KEP. 61/M.PPN/HK/08/2024 sets a stunting reduction target of 18.8% by 2025 (Bappenas, 2024).

Household food security is closely related to the availability, accessibility, stability, and sustainable use of nutritious foods (Gassara & Chen, 2021). FAO's definition of food security emphasizes the need for adequate nutrition, food security, and continuity of nutritional intake for all family members (Clapp et al., 2022). Improving household food security—by promoting a diverse and nutritious diet—can potentially reduce stunting, particularly as children's dietary needs change after 24 months of age (Gassara & Chen, 2021).

A study in Mertak Village, Pujut District, revealed that local food diversification, particularly fish-based products, can significantly lower stunting rates. Education and training programs for PKK (Family Welfare Movement) women and Posyandu (Integrated Health Post) cadres increased participants' knowledge by 96–100%, indicating that building local food capacity contributes to food security and reduces stunting risk (Junaidi et al., 2024). A study in North Lombok Regency shows that the increase in stunting rates is significantly related to food insecurity in toddlers aged 0-59 months ($p < 0.001$), with a low odds ratio (0.086-0.225). These data support the hypothesis that food conditions have local impacts and statistically measurable epidemiological implications (Arfiah et al., 2024).

The decline in Gross Domestic Product (GDP) globally is expected to increase the number of stunted children to around 7 million worldwide, or an increase of about 15 percent (Darmawan, 2023). Aritonang et al. (2020) showed that the increase in toddler stunting rates is caused by low household food insecurity. The risk of stunting in toddlers increased 6.9 times. A Dual Indicator Cluster (MICS) survey in Bangladesh showed that household food insecurity contributes to around 28% of children under five experiencing stunting, 22% being underweight, and 9.8% being malnourished (Rezaul Karim & Tasnim, 2022)

Food is a fundamental human right for every individual to meet their nutritional needs by consuming balanced, healthy, nutrient-dense, and available food at the household level (Prepres RI, 2012). The availability of household food influences the quantity and quality of household food. Household food availability indicates the ability to meet nutritional needs, including the quantity and quality of food. Food availability is influenced by purchasing power and sufficient food sources (Marshya et al., 2023).

Food access affects the fulfillment of the nutritional needs of family members, especially for at-risk age groups (such as toddlers and pregnant women). Households that can meet their food needs regarding economic, physical, and social access can provide good food. On the other hand, food access is considered low if households cannot meet their food needs through economic, physical, or social access (Parwati et al., 2022). Food insecurity in households can pose a risk to nutritional and health problems, especially for vulnerable groups, such as toddlers and pregnant women (Mumtaza, 2024).

Food availability influences household eating habits. Food insecurity, poverty levels, and disaster-prone areas can increase the prevalence of nutritional status problems such as high stunting rates (Sihite et al., 2021).

A decrease in food security is also related to declining family health. Food insecurity is characterized by food insecurity conditions and less diverse food consumption in terms of nutritional content. The HFIAS instrument measures household food security in terms of accessibility. Accessibility describes the ability of households to obtain adequate quantities and quality of food (Adhyanti et al., 2022).

Given these considerations, this study aims to investigate the relationship between household food security and the incidence of stunting among children aged 24–59 months in Central Lombok Regency. The findings are expected to inform nutrition intervention strategies and promote sustainable family-level food security, particularly by adopting local food consumption patterns.

METHOD

This study employed an observational analytic design using a cross-sectional approach. The research was conducted in Central Lombok Regency, with data collection from April to May 2025. Ethical approval was granted by the Research Ethics Committee of Dr. Moewardi Hospital (Approval No: 532/III/HREC/2025, dated March 14, 2025). Additionally, a research permit was obtained from the Central Lombok Regency Health Office (Permit No: 400.7.25.1/041/SDK/III/2025, dated April 14, 2025), confirming authorization to carry out the study.

The study population included toddlers aged 24–59 months residing in four sub-districts and eight villages within Central Lombok Regency. The sampling process involved several stages. First, cluster random sampling was used to determine the number of research locations. Random sampling was then applied to select specific study areas and participants. Finally, the sample of 144 toddlers was determined through purposive sampling based on the inclusion criteria. Sampling was done using a multistage sampling technique. Data collection methods included anthropometric measurements and structured interviews with mothers or primary caregivers. The Household Food Insecurity Access Scale (HFIAS) method is a method for assessing household food security consisting of a questionnaire containing nine questions divided into three food security sections: Anxiety and uncertainty regarding household food supplies. Changes in diet quality, Insufficient amount of food

The nine questions from the HFIAS questionnaire include frequency (how many times) as a follow-up to each question to determine how often a situation occurs. The scores given are 0: never (if the answer is no), 1: rarely (the condition occurs once or twice in the last 30 days), 2: sometimes (3-10 times in 30 days), and 3: frequent (occurs more than 10 times in the previous 30 days). Household scores are categorized as food-safe household (HFIAS =0-1), unsafe (HFIAS = >2) (Ashari et al., 2019)

The study used univariate statistical analysis, including multiple logistic regression tests, to identify the most dominant independent variables that affect

two or more independent variables (food security) and dependent variables (stunting)

RESULTS AND DISCUSSION

Table 1. Characteristics of toddlers and parents of stunting incidence in children aged 24-59 months in Central Lombok Regency.

Category	n=144	(%)
Stunting Incidence		
Stunting	98	(68,1)
Not *Stunting*	46	(31,9)
Gender		
Girls	71	(49,3)
Boy	73	(50,7)
Child Age		
25-36 Months	63	(43,8)
37-48 Months	51	(35,4)
49-60 Months	30	(20,8)
Residence		
Janapria District	36	(25,0)
Langko	18	(12,5)
Kerembong	18	(12,5)
Jonggat District	36	(25,0)
Mockers	18	(12,5)
Perina	18	(12,5)
Pujut District	36	(25,0)
Teruwai	18	(12,5)
Kawo	18	(12,5)
Batukliang District	36	(25,0)
Bujak	18	(12,5)
Pagutan	18	(12,5)
Number of Family Members		
Big Family	109	(75,7)
Small Family	35	(24,3)
Mother's Education		
Primary Education	78	(54,2)
Higher Education	66	(45,8)
Mother's Work		
Working	63	(43,6)
Not working	81	(56,4)
Household Income		
Low Income	93	(64,6)
Good Income	51	(35,4)
Home Food Security		
Food Prone	59	(41,0)
Food Resistant	85	(59,0)

These results show that most toddlers were stunted (68.1%). Most were male (50.7%), and a large proportion were between 25 and 36 months old. The majority of respondents came from large families (75.7%), had mothers with primary-level education (54.2%), and were from low-income households (64.6%). Most households were categorized as food secure (59.0%).

Table 2. Bivariate analysis with a simple logistic regression test

Variables	*Stunting* Incident		*Odds ratio* (OR)	P *Value*
	Stunting n (%)	No *Stunting* n (%)		
Food security			0.66	0.25
Food Insecurity	37(25.7)	22(15.3)		
Food Security	61(42.4)	24(16.7)		
Food Taboo				
There are Food Taboos	15(10.49)	15(10.4)	0.37	0.01*
No Food Taboos	83(57.6)	31(21.5)		
Early-age marriage				
Early-age marriage	48(33.3)	17(11.8)	1.63	0.17
Marriage at the Right Age	50(34.7)	29(20.1)		
Gender				
Woman	54(37.5)	19(13.2)	0.57	0.12
Man	44(30.6)	27(18.8)		
Number of Family Members	72(50)	37(25.7)	0.67	0.365
Big family	26(18.1)	9(6.3)		
Small family				
Mother and Toddler Education				
Low Education	54(37.5)	24(16.7)	1.12	0.74
higher education	44(30.6)	22(15.3)		
Mother's Job				
Work	43(29.9)	20 (13.9)	1.01	0.96
Does not work	55(38.2)	26 (18.1)		
Household income				
Insufficient Income	65 (45.1)	28 (19.4)	1.26	0.52
Good Income	33 (22.9)	18 (12.5)		

Source: Primary Data 2025

Based on the results of Table 4.2 with bivariate analysis, toddlers from families with food insecurity have a 34% lower risk of stunting (OR=0.66) than toddlers from families with good food security. However, this risk is insignificant (p=0.253, 95% CI 0.326-1.343). Children from families who believe in and practice food taboos have a 63% lower risk of stunting (OR = 0.37) than those who do not adhere to food taboos. Based on bivariate analysis, this association is statistically significant (p = 0.019; 95% CI = 0.164–0.853. Mothers who married at a young age (under 19 years) had 1.63 times higher odds of having children with stunting compared to those who married at 19 years or older. However, the association between early marriage and stunting among children was not statistically significant (OR = 1.63; 95% CI = 0.799–3.357; p = 0.178).

Female toddlers had a 43% lower risk (OR=0.57) of stunting than male toddlers (CI: 0.282-1.165, p-value = 0.124). Based on the value p = 0.124 (P>0.05), it was shown that there was no significant

relationship between the sex of toddlers and the incidence of stunting.

Toddlers who came from families with a large number of family members had a 33% smaller risk (OR=0.67) of stunting compared to toddlers who came from families with a small number of family members, with a value of p = 0.365 (P>0.05), this suggests that there is no significant relationship between the number of family members and the incidence of stunting. Mothers of toddlers who have a low level of education have a 1.125 times greater risk of having a child who is stunted compared to mothers who have a high level of education. Based on the value of p = 0.742 (P>0.05), it was shown that there was no significant relationship between maternal education and stunting incidence.

The employment status of working mothers increased the risk of stunting in children by 1,016 times compared to non-working mothers. Based on the value p = 0.964 (P>0.05), it was shown that there was no significant relationship between the employment status of mothers under five and the incidence of stunting. Low-income households increased the risk of stunting in children by 1.266 times compared to high-income households (OR: 1.266, CI: 0.613-2.615, p-value = 0.524). Based on the value of p = 0.524 (P>0.05), there is no significant relationship between household income and stunting incidence.

Table 3. Multivariate analysis of multiple logistic regression tests

Variable	Odds Ratio (OR)	95% CI	P *Value*
Food Security	0,559	0,252-1,240	0,153
Has Food Taboos	0,420	0,178-0,989	0,047*
Early marriage	1,891	0,866-4,128	0,110
Gender Female	0,539	0,256-1,139	0,105

Table 3 shows that, when analyzed using multivariate analysis of multiple logistic regression tests, toddlers from families with food security issues had a 44% lower risk of stunting (OR=0.56) than toddlers from families with good food security. However, the risk was insignificant (p=0.153, 95%CI= 0.25–1.24). Children from families who believe in and practice food taboos have a 58% lower risk of stunting (OR = 0.42) than those without food taboos. This association was statistically significant (p = 0.047; 95% CI = 0.17–0.99). Toddlers from families who married early had a 1.89 times greater risk of stunting (OR = 1.89) than toddlers from families who married of age. However, the risk was not statistically significant (p value = 0.110, 95%CI = 0.87 – 4.13). Girls of toddler age had a 46% lower risk of stunting (OR = 0.54) than boys under five, but the risk was not statistically significant (p=0.105, 95%CI= 0.26 – 1.14).

DISCUSSION

The relationship between household food security and stunting incidence in children under five years of age, 24-59 months

This study found no statistically significant relationship between household food security and stunting among children aged 24–59 months in Central Lombok Regency (p = 0.153). These findings align with Zalukhu et al. (2023), who reported similar results using the same HFIAS tool (OR = 3.094; 95% CI: 0.609–15.719; p = 0.191). According to HFIAS results, 41% of households were food insecure—indicating concerns over meal provision, affordability of nutritious foods, and portion sizes.

A study in the Cintapuri Darussalam Health Center Working Area showed no significant relationship between household food security and the incidence of toddler stunting. Various factors, including differences in research methodology, population characteristics, and controlled variables in the analysis, can cause these results. In addition, other factors such as parenting, maternal knowledge of nutrition, and access to health services can also affect a child's nutritional status. Efforts were made considering local culture and other factors contributing to *stunting* (Qatrunnada et al., 2023).

This research is inversely proportional to the research conducted by Laode Wado et al. (2019), which reported a significant association between food security and the incidence of stunting in children aged 12-59 months. Low food security impacts the quality and quantity of children's nutritional intake, affecting toddlers' growth and development. A study (Nasifah & Sukendra, 2021) found that household food access, especially economic and social access, was significantly related to stunting in children aged 24-59 months during the COVID-19 pandemic. This emphasizes the importance of economic stability and social support in ensuring food security. Families with limited access to food tend to have difficulty meeting their children's optimal nutritional needs. Therefore, interventions that increase access to food can help reduce the prevalence of stunting. (Nasifah & Sukendra, 2021)

Household problems with food include the family's inability to provide enough food in terms of quantity, quality, and diversity according to the needs of each family member, especially the adequacy of nutrition in the form of energy, protein, fat, and carbohydrates, as well as vitamins and minerals (Bezerra et al., 2024). Research shows that the leading causes of stunting are related to the level of consumption and infections that affect its occurrence. At the same time, food security has an indirect impact (Islam et al., 2025).

Two factors that cause stunting in toddlers regarding food security are food availability and public access to nutritious food. Based on interviews with respondents, people's habits do not prioritize food quality (nutritional value) but focus on quantity, and toddlers' eating schedules are irregular (Putri et al., 2024).

Research and community service have been conducted to improve household food security and public knowledge of stunting prevention. The research conducted by Sukanty et al. (2023) in Jelantik Village, Jonggat District, Central Lombok Regency, applied interventions through counseling programs and demonstrations of local food processing. This program aims to increase public knowledge about stunting and skills in utilizing local food as a preventive measure. One of the local food ingredients used in this program is rice field snails, which are known as a source of nutrient-rich animal protein. Rice field snails contain 51.8% protein, 13.6% fat, 6.09% fiber, and 24% ash, so it has the potential to support the fulfillment of children's micro and macro nutritional needs. Through implementing the Healthy Kitchen to Overcome Stunting (DASHAT) program, this intervention has succeeded in increasing the knowledge and skills of the community in processing nutritious local food as part of a stunting prevention strategy based on local resources. The results of the intervention activities showed that the approach through counseling and demonstration directly contributed to the increase of maternal and family knowledge related to stunting prevention. In addition, this program also encourages increased consumption of animal protein from local sources, which can significantly help reduce the risk of stunting in toddlers. Thus, using local food through structured education has proven effective in supporting family food security and reducing stunting rates at the village level (Sukanty et al., 2023).

Research by Wamgiyana et al. (2021), Nutrition and Food Studies (2020) in Central Lombok, found that the frequency and quantity of complementary foods were significantly related to stunting (OR=2.0-2.3; $p<0.05$), suggesting that food security is not only about availability but also about food consumption practices. (Wangiyana et al., 2021). Barriers to access sanitation and clean water further exacerbate this problem, with a policy study in Bilebante citing the clean water crisis as a contributing factor to the high incidence of stunting. Lack of timely nutrition education also leads to

suboptimal complementary feeding practices, worsening family food security. Community-based total sanitation (CBTS) policies are also important to improve food security through access to clean water, effective sanitation management, and nutrition education (Hamdi et al., 2023).

The relationship between food taboos and stunting incidence in children under five years of age, 24-59 months

Based on the results of the multivariate analysis, food taboos were found to be significantly associated with stunting among children aged 24–59 months in Central Lombok Regency (OR = 0.419; 95% CI = 0.178–0.988; p = 0.047). These findings are consistent with a study conducted by Hafiza et al. (2025), which reported a significant relationship between maternal belief in food taboos and the incidence of stunting (p = 0.000), as well as a significant association between maternal cultural background and stunting (p = 0.003). One of the direct and indirect factors influencing nutritional status is cultural eating practices, which include food taboos and restrictions. Food taboos observed during pregnancy may limit the intake of essential nutrients, particularly proteins, vitamins, and minerals (Hafiza et al., 2025)

Beliefs in food taboos are still common in local cultures and influence household food consumption patterns. Nutritious foods such as eggs, fish, meat, and seafood are often perceived as causes of illness or believed to be unsuitable for children and breastfeeding mothers. These beliefs restrict the types of food given to children, reducing the essential nutrients needed during the growth period.

The results of this study showed that 30 mothers of children under five (20.8%) adhered to cultural food taboos or restrictions during pregnancy, breastfeeding, and when their children were ill. Most respondents reported receiving these prohibitions from their parents or in-laws, particularly their mothers, advising them not to consume certain foods during pregnancy. These restrictions were based on traditional beliefs that were not supported by scientific evidence.

Foods rich in protein, such as chicken, tuna, eggs, spicy sambal, water spinach (Ipomoea aquatica), and other spicy or strongly flavored dishes, are often considered food taboos or restrictions. During breastfeeding, mothers are frequently advised to avoid these foods for various reasons, many of which are not scientifically substantiated. Some breastfeeding mothers believe that consuming fishy-smelling foods causes their breast milk to have an unpleasant odor, making infants refuse to nurse. For example, tilapia is prohibited by some mothers-in-law, who believe that it negatively affects breast milk quality and may cause a condition locally referred to as pingsan or buk kepait in the Sasak language—a term used to describe a decline in the taste or quality of breast milk.

Hermila et al. (2023) found that the absence of exclusive breastfeeding is a risk factor for stunting, and food taboos are also significantly associated with stunting (p = 0.018). This study highlights how cultural eating practices, especially those influenced by traditional customs, can affect dietary behavior, including eating patterns, frequency, meal timing, food choices, and the increasing habit of consuming fast food and snacks. These foods are typically high in calories and fats but low in essential micronutrients, which further exacerbates the risk of malnutrition and stunting in children (Hermila et al., 2023)

CONCLUSION

Based on the explanation above, the following conclusions can be drawn. First, there is a significant association between food taboos and the incidence of stunting among children aged 24–59 months in Central Lombok Regency. In contrast, household food security, early marriage, and sex were not significantly associated with stunting. Food insecurity does not fully explain the determinants of children's nutritional status.

Social factors shape the dynamics of parenting and food distribution. Cultural values influence food choices and dietary practices. Environmental conditions determine access to clean water and sanitation. Interactions between these variables complexly shape stunting risk.

Second, efforts to prevent stunting should not rely solely on food security improvements. Instead, a multi-sectoral approach involving nutrition education, community-based sanitation programs (STBM), access to clean water, and behavioral change interventions is essential. These strategies can help strengthen food security, improve hygiene, and ensure better nutritional outcomes for toddlers.

Intervention strategies to address stunting should not ignore local cultural dimensions, particularly food taboos. The government and health workers need to map food taboos still practiced by the community and identify which are harmful, neutral, or even adaptive.

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