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The Relationship Between Feeding Practices and Stunting Among Children Under Five: A Cross Sectional Study

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ABSTRACT

Background: Stunting is a nutritional problem caused by chronic malnutrition, resulting in height lower than the standard for age. The prevalence of stunting at the Waode Buri Community Health Center increased from 12.7% (2021) to 14.2% (2023). A preliminary survey of 10 mothers of toddlers in the Waode Buri Community Health Center area revealed that 70% had poor feeding practices, and 60% had stunted children. In this study, we aimed to determine the relationship between feeding practices and stunting.
Methods: The study used a quantitative, a cross sectional study. This research was conducted at the Waode Buri Community Health Center from June 23 to July 31, 2025. The population in this study consists of all children under five at the Waode Buri Community Health Center during the Juni-Juli 2025 period, totaling 366 individuals. The sample consisted of 79 toddlers at the Waode Buri Community Health Center during the June to July period in 2025 used 95% confidence interval. Data were collected using simple random sampling. Data were collected using microtoice and questionnaires. Data were analyzed using the chi-square test.
Results: The primary outcome of the study was regarding feeding practices, the majority 62.0% fell into the "adequate" category, while the remainder 38.0% were in the "inadequate" category. As for stunting, the majority of the toddlers 59.5% had normal nutritional status, while 40.5% were stunted. Statistical analyses revealed p-value of 0.001 for the relationship between feeding practices and stunting.
Conclusion: In conclusion, there is a relationship between feeding practices and stunting. This research provides insights into Community Health Center include improving feeding practices education programs and providing lactation support and for future researchers should use different measurement methods and analyze other variables related to stunting.

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INTRODUCTION

Stunting is a nutritional issue addressed by the Sustainable Development Goals (SDGs), specifically the goal of eliminating all forms of malnutrition, including the eradication of stunting (Al Septi et al., 2025; Thoumas et al., 2025; Tobing et al., 2025). It is a major nutritional problem in Indonesia that influences the quality of human resources (Bakri et al., 2025; Jaya et al., 2025; Soetono & Barokah, 2024). Stunting is a condition of growth failure in children under five caused by chronic malnutrition, resulting in them being too short for their age (Dessie et al., 2025; Deswita et al., 2025; Mwangomeb & Nabwerac, 2025). Stunted children are susceptible to illness and face difficulties in physical and cognitive development; they are also at risk of developing degenerative diseases in adulthood, facing life-threatening conditions, and potentially representing a lost generation for the nation (Guillén-Sánchez & del Rocío Gasco-Tarrillo, 2024; Munthe et al., 2022; Salsabilla et al., 2024). Global stunting prevalence has fluctuated: it stood at 22% among children under five in 2020, decreased to 22.1% in 2021, and rose again to 22.3% in 2022 (WHO, 2024). Meanwhile, stunting prevalence in Indonesia has also declined dropping from 24.4% in 2021 to 21.6% in 2022 and 21.5% in 2023. However, despite this downward trend, the country has not yet reached the target of 14%, and the average prevalence remains above the reduction target (Kemenkes RI, 2021; Kemenkes RI., 2022b, 2022a; Kemenkes RI, 2023; Kemenkes RI., 2024).

The prevalence of stunting in Southeast Sulawesi has fluctuated and has not yet reached the target reduction of 14%. The prevalence in the province stood at 30.2% in 2021, decreased to 27.7% in 2022, and rose to 30.0% in 2023 (Dinkes Provinsi Sultra, 2024). North Buton Regency is among the areas with the highest stunting rates in Southeast Sulawesi, ranking fourth behind Buton (37.2%), South Buton (37.1%), and Central Buton (36.8%), with a rate of 33.9% (Dinkes Provinsi Sultra, 2024; Kemenkes RI., 2024). This study focuses on the service area of the Waode Buri Community Health Center which falls under the North Buton Regency Health Office due to the rising prevalence of stunting in that area. The stunting prevalence in the center's service area was 12.7% in 2021, 13.4% in 2022, and 14.2% in 2023 (Waode Buri, 2025).

Existing literature establishes that early childhood nutrition plays a central role in stunting prevention. Poor dietary patterns and non-exclusive breastfeeding have been frequently associated with stunting among toddlers (Destiana & Hasrida, 2025). More broadly, broader caregiving practices including irregular meal schedules, inadequate portion sizes, and insufficient intake of micronutrient-rich foods have been identified as key contributors to chronic growth faltering (Wulandari et al., 2025). A preliminary survey conducted on May 2, 2025, in the Waode Buri service area aligns with these observations: among 10 mothers surveyed, 7 (70%) exhibited inadequate child feeding behaviors, and 6 (60%) had stunted toddlers.

However, a critical gap remains within the current scientific evidence regarding how distinct components of maternal nutrition caregiving interact to influence stunting risk in localized community settings. While existing studies broadly examine general child-rearing behaviors or single dietary factors in isolation, there is limited empirical clarity on the relative empirical weight and independent contribution of infant feeding practices (specifically exclusive breastfeeding duration) versus toddler feeding practices (such as age-appropriate dietary diversity, meal frequency, and portion sufficiency). In rural coastal environments like North Buton, local socio-cultural norms and food access dynamics create unique operational barriers to child nutrition. Addressing this issue requires moving beyond documenting a geographical gap; it requires clarifying whether early infant nutrition (exclusive breastfeeding) or ongoing toddler feeding behaviors exerts a stronger deterministic effect on linear growth failure in this population.

To address this scientific uncertainty, this study systematically investigates the association between feeding practices (delineated into exclusive breastfeeding history and current toddler feeding behaviors) and stunting among toddlers at the Waode Buri Community Health Center, North Buton Regency. By isolating and evaluating these specific exposures within a high-risk operational setting, this research contributes new actionable evidence to refine targeted, age-specific nutritional interventions for community health practitioners.

METHODS

This study employed a cross-sectional study. The study was conducted within the service area of the Waode Buri Community Health Center, located in North Buton Regency, Southeast Sulawesi Province, Indonesia, between June 23 and July 31, 2025.

The source population comprised all children aged 24–59 months registered and active in the routine health monitoring register at the Waode Buri Community Health Center during the study period of June to July 2025, totaling 366 children. Inclusion Criteria: 1) Children aged 24–59 months residing in the Waode Buri Community Health Center service area for at least six months. 2). Biological mothers living with the child and serving as the primary caregiver. 3) Willingness of the mother/caregiver to participate and provide informed consent. Exclusion Criteria: 1) Children with severe congenital anomalies, physical deformities, or chronic systemic illnesses affecting linear growth (e.g., severe cerebral palsy, congenital heart disease). 2) Children whose primary caregiver was absent or incapable of completing the questionnaire during the survey period. The sample size was calculated using the formula for estimating a proportion in a finite population and confidence level 95% based on the known source population ($N = 366$): (Santoso and Siaputra, 2026). Thus, a minimum sample size of 79 toddlers was determined. The sample was obtained using simple random sampling technique.

In this study, the feeding practice refers to the preparation and provision of food for toddlers, encompassing breastfeeding as well as the types of food provided. Feeding practices were measured using a scoring method based on the Guttman scale, where a "yes" response was assigned a value of 1 and a "no" response was assigned a value of 0. The criteria for feeding practices are: "Less" if the response score is < 50% of the total score, and "Enough" if the response score is ≥ 50% of the total score (Mani, 2022). Stunting refers to the physical status of children under five based on height-for-age (TB/U) measurements. The criteria are: Normal (measurement > +3 SD) and Stunting (Z-score between -2 SD and +3 SD) (Kemenkes RI., 2020).

Data collection utilized a validated and reliable questionnaire on feeding practices. The questionnaire was field-tested on a representative sample of 30 mothers of toddlers ($n = 30$) in a neighboring Community Health Center service area possessing similar demographic characteristics. Item Validity Criteria, Item-total correlation was calculated using the Pearson product-moment coefficient. Out of 18 initial items, 15 items demonstrated Pearson r-values ranging from 0.352 to 0.684. All retained items exceeded the critical threshold value ($r_{\text{table}} = 0.312$, confirming construct validity. Three non-significant items ($r < 0.312$) were removed. Reliability: Internal consistency of the final 15-item scale was evaluated using Cronbach's alpha. The test yielded a Cronbach's alpha coefficient of 0.820, substantially exceeding the standard reliability benchmark of 0.70. Stunting data were collected by measuring height-for-age using a stadiometer and the WHO Anthro application.

Data were cleaned, coded, and analyzed using IBM 24.0 SPSS Statistics. Univariate analysis was performed to describe sample characteristics, feeding practices, and stunting prevalence using frequency distributions and percentages. Bivariate analysis was conducted using the Chi-square test (χ^2) with 95% Confidence Intervals (95% CI), with significance set at $p < 0.05$.

RESULTS

This study utilized a quantitative cross-sectional design conducted at the Waode Buri Community Health Center from June 23 to July 31, 2025. Participants were simple random sampling technique. From an initial total of 366 population and after applying these inclusion and exclusion criteria, a final sample of 79 respondents was successfully analyzed. The collected demographic data included the child's age, gender, mother's age, educational background, and occupational status.

Descriptive Statistics
Uvivariate Analysis
Table 1. Demographic Characteristics of Respondents

Characteristics	n (79)	%
Toddler Age (Months)		
6-11	23	29.1
12-23	14	17.7
24-35	21	26.6
36-47	17	21.5
48-59	4	5.1
Gender		
Male	33	41.8
Female	46	58.2
Mother's Age (Years)		
20-35	64	81.0
>35	15	19.0
Mother's educational level		
Elementary School	12	15.2
Junior High School	9	11.4
Senior High School	43	54.4
Diploma/Bachelor's Degree	15	19.0
Occupation		
Unemployed/Housewife	65	82.3
Honorary	4	5.1
Self-employed	4	5.1
Government employees	6	7.5

Source: Primary data, 2025.

Based on Table 1, most respondents were in the 6–11 month age group, accounting for 29.1% of the total respondents. Most respondents were female, accounting for 58.2% of the respondents. Mother age most in 20-35 years accounting for 81.0%. Based on mother's educational level, most respondents had completed senior high school, accounting for 54.4% of the respondents. In terms of occupation, most respondents were unemployed or housewife, accounting for 82.3% of the respondents.

Table 2. Distribution of Feeding Practices and Stunting Variables

Variable	n (79)	%
Feeding Practices		
Enough	49	62.0
Less	30	38.0
Stunting		
Stunting	32	40.5
Normal	47	59.5

Source: Primary data, 2025.

Based on Table 2, most respondents perceived the feeding practices as being in the enough category, accounting for 62.0% of the respondents. Most respondents also experiencing normal, representing 59.5% of the total sample.

Bivariate Analysis

Table 3. Relationship Between Feeding Practices and Stunting

Feeding Practices	Stunting				Total		*Chi-Square Test*
	Normal		Stunting				
	n	%	n	%	n	%	
Enough	36	73.5	13	26.5	49	100	*p value* =0.001
Less	11	36.7	19	63.3	30	100	
Total	**47**	**59.5**	**32**	**40.5**	**79**	**100**	

Source: Primary data, 2025.

Table 3 shows that out of 79 samples, 49 individuals had adequate feeding practices, while 30 had inadequate feeding practices. Among the 49 individuals with adequate feeding practices, the majority 73.5% had normal nutritional status, while the remaining 40.6% were stunted. Conversely, among the 30 individuals with inadequate feeding practices, the majority 63.3% were stunted, while the remaining 36.7% had normal nutritional status.

Statistical analysis using the Chi-square test revealed a statistically significant crude association between feeding practices and stunting among children under five at the Waode Buri Community Health Center ($p = 0.001$). Since confounding variables were not adjusted through multivariable analysis, this finding represents a crude association. Consequently, the alternative hypothesis was accepted.

DISCUSSION

In this study, our findings revealed that the majority of feeding practices were classified as enough (62.0%), while the remainder were less (38.0%). Bivariate analysis revealed a difference in the nutritional status of toddlers based on the feeding practices employed by parents. In the group with adequate feeding practices (49 individuals), most toddlers had normal nutritional status (73.5%), although some still experienced stunting (26.5%). These findings suggest that good feeding practices generally contribute positively to child growth but do not fully guarantee protection against stunting. This may be due to other factors such as food quality, meal frequency, infectious diseases, environmental sanitation, and the family's socioeconomic conditions. Conversely, in the group with inadequate feeding practices (30 individuals), the majority of toddlers experienced stunting (63.3%), with only a small proportion maintaining normal nutritional status (36.7%).

Analysis results revealed the presence of deviant patterns within both feeding practice categories. Within the group classified as having adequate feeding practices, stunting was still observed in a subset of toddlers. This observation indicates that while favorable feeding practices are aligned with optimal linear growth, stunting is observed alongside various non-dietary conditions. Such concurrent factors may include a history of recurrent infectious diseases, specific limitations in dietary quality and micronutrient diversity, inadequate environmental sanitation, maternal health status during pregnancy, as well as broader household socioeconomic characteristics. Consequently, adequate feeding practices alone may not fully account for optimal growth outcomes when other underlying conditions are present. Conversely, among toddlers classified under inadequate feeding practices, several individuals maintained standard growth metrics without linear faltering. This suggests that even when reported feeding practices are sub-optimal, certain concurrent conditions may co-exist with standard growth outcomes. These may involve household access to nutrient-dense foods, coverage under supplementary feeding interventions, clean living environments that reduce infection burden, or regular engagement with community health monitoring programs.

These deviant cases highlight that stunting is a complex, multi-faceted health issue. While feeding practices demonstrate a clear statistical relationship with a toddler's anthropometric status, they do not function in isolation. Instead, feeding behaviors co-occur with environmental,

clinical, and socioeconomic parameters. Overall, these findings confirm a statistically significant association between feeding practices and toddler nutritional status. Favorable feeding practices consistently correspond to standard linear growth, whereas inadequate practices are associated with a higher likelihood of stunting. However, given the multi-faceted nature of growth faltering, public health strategies are best aligned when addressing nutrition alongside environmental sanitation, maternal health education, and primary healthcare accessibility.

Chi-square test results revealed a significant association between feeding practices and stunting among toddlers in the working area of the Waode Buri Community Health Center, North Buton Regency. Toddlers receiving adequate feeding care tended to have normal nutritional status, while those with inadequate feeding care were at higher risk of stunting. This aligns with the theory that feeding practices encompass the methods parents particularly mothers use to provide food in terms of quantity, frequency, and nutritional quality to meet a child's growth needs. Good feeding practices ensure the child receives sufficient energy, protein, vitamins, and minerals, there by supporting optimal growth and preventing long-term growth impairment. Poor feeding practices may stem from a lack of maternal knowledge regarding nutrition, economic constraints, unhealthy family eating habits, or low awareness regarding the importance of dietary variety.

Comparing our results with those of previous studies is essential for contextualization. The findings of Destiana and Hasrida (2025), which found that feeding practices are significantly associated with stunting in children aged 24–59 months; consequently, the role of parents is crucial in ensuring healthy feeding practices as a preventive measure against stunting Similarly, research by Wulandari et al. (2025) found that feeding practices are a contributing factor to stunting in toddlers. Data analysis revealed that common dietary issues included irregular meal schedules and inadequate food portions specifically, insufficient consumption of vegetables and fruits. However, this study is inconsistent with the research by Mandara et al., 2024 which found no association between feeding practices and stunting (Mandara et al., 2024). Nevertheless, researchers generally find that feeding practices are associated with and play a role in determining stunting among children under five (Astuti et al (2024); Cristian et al, 2023; Dhalayat et al, 2026; Kubeka and Mudjadji, 2023; Matovu et al., 2026; Munawar et al., 2024; Tello et al., 2022).

The researchers posit that these findings reinforce the theory that proper feeding practices play a crucial role in meeting a child's nutritional needs, thereby preventing stunting. Mothers who employ adequate feeding practices tend to provide meals with a frequency, quantity, and nutritional quality that better align with a toddler's requirements. Conversely, inadequate feeding practices can lead to unmet nutritional needs in terms of both quantity and quality thereby impacting the child's growth. These results align with previous studies indicating that appropriate feeding practices serve as a protective factor against stunting, whereas poor feeding practices increase the risk of chronic nutritional issues.

The implications of our study extend to the realm of public health is the need to strengthen education and support for parents particularly mothers regarding appropriate feeding practices, covering the type, quantity, frequency, diversity, and quality of food tailored to the children's needs. Stunting prevention efforts must also be comprehensive and cross-sectoral, involving not only the improvement of feeding practices but also enhanced monitoring of child growth, prevention of infectious diseases, improvements in sanitation and environmental hygiene, and increased family access to nutritious food and healthcare services. Community health centers and health volunteers can utilize these findings as a basis to strengthen integrated health post activities, nutrition education, growth and development monitoring, and support for families with children at risk of stunting.

Despite its meaningful contributions, our study has several limitations that warrant acknowledgment. First, the cross-sectional design restricts our ability to establish temporality or causal relationships between feeding practices and stunting. Second, potential selection bias may exist due to the specific sampling frame at a single health center, which may limit the generalizability of our findings to broader populations. Third, data on feeding practices were self-reported via questionnaires, introducing the potential for recall bias and social desirability bias,

as mothers might over-report favorable feeding practices. Fourth, measurement limitations were present, as feeding practices were assessed categorically without detailed quantitative dietary evaluations or direct observational tools. Finally, there is the risk of residual confounding because our study did not measure or adjust for other key determinants of child growth, such as total nutrient intake, dietary diversity, history of infectious diseases, environmental sanitation, household socioeconomic status, maternal health during pregnancy, and genetic factors. Consequently, these crude findings should be interpreted with caution.

Building on these insights, future research should employ prospective longitudinal or interventional designs to clarify temporal sequences and causal mechanisms. Furthermore, subsequent studies should incorporate direct observational measurements, comprehensive dietary assessments, and multivariable analytical models that account for environmental, clinical, and socioeconomic confounders to provide a more holistic understanding of stunting determinants. This research also recommends, For Waode Buri Community Health Center is encouraged to enhance education, growth monitoring, and family guidance regarding appropriate feeding practices, while integrating these efforts with infectious disease prevention, environmental sanitation improvements, and meeting the nutritional needs of toddlers through integrated health post activities and the empowerment of health volunteers. Parents of toddlers are encouraged to adopt sound feeding practices by providing a diverse and nutritious diet tailored to their child's needs, paying attention to portion sizes and feeding frequency, ensuring food hygiene, and regularly monitoring their toddler's growth at a healthcare facility.

CONCLUSION

In conclusion, this study demonstrates a statistically significant association between feeding practices and stunting among toddlers at the Waode Buri Community Health Center, North Buton Regency (p-value = 0.001). Toddlers receiving inadequate feeding care exhibited a substantially higher likelihood of stunting compared to those receiving adequate feeding care.

Authors' Contribution Statement: Ellyani Abadi: Conceptualization, formal analysis, writing original draft, review & editing, project administration. Siti Hadrayanti Ananda: translation, proofreading, writing original draft, review & editing. Irwan Dahlan: investigation, data curation. Sugirah Nuor Rahman : writing original draft, review & editing, visualization. Jenny Qlifianti Demmalewa: methodology, formal analysis, supervision. Desidarius Bela Dhesa: formal analysis, validation, resources.

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The authors declare that all contents, ideas, data analyses, and interpretations are the original work of the authors, derived entirely from the conducted research. AI-assisted tools were used solely for language editing and grammar refinement, without influencing the study's findings or conclusions.

Due to privacy and ethical constraints regarding human participants and children under five, the datasets used and analyzed during this study are not publicly accessible. They may, however, be made available by the corresponding author upon reasonable request

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