

Profile of Infant Feeding Practices, Household Socioeconomic Conditions, and Food Access Among Stunted children under five in Disaster-Prone Areas of West Aceh

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Abstract

Background: Stunting is a global health problem that occurs frequently in developing countries, especially in low- to middle-income countries. In addition, disaster-prone areas such as West Aceh have a high risk of food insecurity, which can be a contributing factor to stunting. The prevalence of stunting in Aceh (28.6%) is higher than the national figure (24.4%). **Objective:** The purpose of this study was to describe feeding practices, exclusive breastfeeding, social and economic status, food access, and the lack of nutritional education among mothers of stunted children under 5. **Method:** This study used a descriptive cross-sectional analysis and was conducted in Woyla District, West Aceh in February 2026. The subjects of this study were 30 mothers of stunted children who were given questionnaires and 24-hour recalls of their children's intake. **Results:** 56.7% of stunted children received exclusive breastfeeding and only 36.3% of stunted children received appropriate feeding. In addition, the level of parental education (60%) and family income (70%) of stunted children were relatively low. The research also showed inadequate access to food and the lack of nutrition education for families of stunted toddlers. **Conclusion:** Stunted children in Woyla District, West Aceh, still require appropriate treatment due to numerous contributing factors that have not been addressed, such as inappropriate feeding practices, low education and income, difficult food access, and the lack of nutrition education for families.

Keywords: Stunted, Children under five, Disaster Prone Areas, Infant Feeding, Socioeconomic Conditions

Introduction

Stunting remains an important public health concern for children under 5. It mirrors chronic undernutrition at times of development when more vulnerable to disease and is linked with poor cognitive development, underachievement in school, lowered economic productivity in adulthood and increased risk of non-communicable disease later in life. In 2024, an estimated 149 million children under the age of 5 (22%) were stunted, according to a report of the study. World prevalence has been declining for over 20 years whereas the current level is much higher compared to the target set by Sustainable Development Goals (SDGs) and the World Health Assembly nutrition targets 2030 (UNICEF, WHO & World Bank, 2025). Despite active state measures, stunting has been a prevalent nutritional problem in Indonesia. The Indonesian Nutrition Status Survey (SSGI) show that stunting rate went from 24.4% in 2021 to 21.6% in 2022. However, when compared with the WHO (20%) standards, this data shows that stunting is still high and constitutes a significant public

health issue globally (Ministry of Health of Indonesia, 2023).

Aceh province, with 28.6% and West Aceh District with 20.2%, had the most stunting in this country. These findings show that stunting is still widespread in nutrition of people in the region and at the worst part of vulnerable groups (Aceh Provincial Government, 2025). West Aceh is a disaster-stricken area with flooding and erosion of its coastlines. Such factors would further compound family food insecurity and further restrict access to medical facilities and reduce home food options and healthy food consumption, which will then influence feeding patterns when it comes to baby and child health food (FAO, 2022; WHO, 2024).

Based on the UNICEF Conceptual Framework on Maternal and Child Nutrition, the stunting was due to the interplay between the direct factors, such as limited diet and common infection, and then, also, of root causes, such as inappropriate feeding behaviours of the infants and inadequate home feeding practices, household food insecurity, access to health care, and in the long run economic, political, and social determinants (UNICEF, 2021). Breastfeeding, exclusive breastfeeding, and complementary feeding are well-established evidence-based, effective interventions utilized with infants in the first 1,000 days of life. But, according to those factors, parental education, household income, food availability and nutrition education are the factors which may influence these interventions. Socioeconomic status would also play an indirect role on food and access to more nutritionally dense food to children and risk to continue chronic undernutrition (Victora et al., 2016; Black et al., 2013; Smith & Haddad, 2015). Various studies have been done on the determinants of stunting in Indonesia, but there are no evidence of infant feeding characteristics, socio-economic backgrounds, food access, nutrition education, and nutritional intakes among stunted children living within disaster-affected areas. Thus, the objective of the present study is to investigate the feeding behavior, household socioeconomic status, and food access and nutritional education and intake among stunted children under five from the disaster-prone West Aceh District in Indonesia.

Methods

A cross-sectional descriptive survey was carried out at Woyla sub-districts of West Aceh in February 2026. Thirty Mothers with stunted children under 5 were purposively sampled. The nutritional status was additionally ascertained according to anthropometrical length and/or height measurements of children according to the WHO Growth Standards. Height-for-age (HAZ) Z-scores were classified as stunted (Z-scores < -2 standard deviations) or not stunted (Z-scores > -2 SD). 2x24 food recall was used in the experiment as a dietary recall task with structured questionnaires for mother. Adequacy of intake was determined through the use of the Indonesian Recommended Dietary Allowances (AKG), in excess ($>120\%$ of RDA), normal (90–119%), mild deficit (80–89%), moderate deficit (70–79%) and severe deficit ($<70\%$). Educational level of parents, total household income, exclusive breastfeeding, complementary feeding (or MP-ASI), access to food in the home and nutrition education were also included. Descriptive statistics of categorical data reports: The categorical reports are presented as frequencies and percentages for categorical data. Ethical recommendations were followed when collecting data, and written informed consent was obtained from all subjects before data collection.

Results

Subject Characteristics

The baseline characteristics of the participating stunted children under five and their mothers are presented in **Table 1**.

Table 1. Characteristics of stunted children under five and their mothers

Variable	Category	N (%)
Child's sex	Male	16 (53.3)
	Female	14 (46.7)
Child's age	≤ 24 months	11 (36.7)
	>24 months	19 (63.3)
Mother's age	20-35 years	21 (70.0)
	>35 years	9 (30.0)

Table 1 shows that of the 30 stunted children aged < 24 months, 14 (46.7%) were stunted and 16 were aged > 24 months. Furthermore, more mothers of stunted toddlers were aged 20-35 years (70%) than those aged > 35 years (30%).

Profile of Infant Feeding Practices, Household Socioeconomic Conditions, Food Access, and Nutrition Education Among Stunted Children Under Five

The profile of infant feeding practices, household socioeconomic conditions, food access, and nutrition education among families with stunted children under five is summarized in **Table 2**.

Table 2. Profile of Infant Feeding Practices, Household Socioeconomic Conditions, Food Access, and Nutrition Education Among Stunted Children Under Five

Variable	Category	n (%)
Exclusive Breastfeeding	Yes	17 (56.7)
	No	13 (43.3)
Complementary Feeding (MP ASI)	Appropriate	11 (36.3)
	Inappropriate	19 (63.3)
Parental Education	Low	18 (60)
	High	12 (40)
Household Income	Low	21 (70)
	Adequate	9 (30)
Household Food Access	Poor	20 (66.7)
	Adequate	10 (33.3)
Nutrition Education	Received	10 (33.3)
	Not Received	20 (66.7)

Table 2. Feeding practice and family socio economic status, access to food and nutrition education for children below the age of five in households with stunted children below the age of five. Exclusive breastfeeding was practiced by

56.7% of the children and 43.3% did not. However, inappropriate complementary feeding practices were quite common among caregivers; 63.3% of children with complementary feeding did not follow the guidelines. In socioeconomics, 60.0% of parents had a low educational level, and 70.0% have low monthly income. In addition, 66.7% of households (low or no access to nutritious food) expressed poor food access, suggesting that there is not availability or affordability of healthy food. Likewise, only 33.3% of mothers received nutrition education while 66.7% of mothers never received any nutrition or child feeding education.

Energy and Macronutrients Adequacy among Stunted Children Under Five

The adequacy of daily energy and macronutrient intake among stunted children under five, as assessed using a 24-hour dietary recall, is presented in **Table 3**.

Table 3. Distribution of Energy and Macronutrients Adequacy among Stunted Children Under Five

Nutrition Intake	Excess n (%)	Normal n (%)	Mild Deficit n (%)	Moderate Deficit n (%)	Severe Deficit n (%)
Energy	3 (10)	15 (50)	1 (3.3)	7 (23.3)	4 (13.3)
Carbohydrate	11 (36.7)	14 (46.7)	3 (10)	0 (0)	2 (6.7)
Protein	2 (6.7)	10 (33.3)	11 (36.7)	5 (16.7)	3 (10)
Fat	6 (20)	11 (36.7)	8 (26.7)	2 (6.7)	3 (10)

Table 3 shows the distribution of daily nutrient intake in stunted children under 5 years of using 24-hour food recall. Of these children, 50.0% showed adequate energy intake, 36.6% had different degrees of energy deficit and 10.0% excessive energy intake. The average amount of protein consumption was classified as a mild deficit (40.7%) and normal (37.0%). In terms of fat intake, 36.7% of children had sufficient fat intake, in relation to 43.4% who had differential amounts of fat deficiency. Consumption of carbohydrate was also relatively well-balanced, as 46.7% of children met the recommended carbohydrate intake level and 36.7% consumed carbohydrate above the recommended amount.

Discussion

Profile of Infant Feeding Practices, Household Socioeconomic Conditions, Food Access, and Nutrition Education Among Stunted Children Under Five

Results showed that exclusive breastfeeding was practiced by only 56.7% of stunted toddlers, and 43.3% did not have exclusive breastfeeding. It is also a very long way from the World Health Organization recommendation for all infants to receive exclusive breastfeeding for six months. Indeed, infants are heavily reliant on exclusive breastfeeding, which is the most widely available source of adequate nutrients, immunological components, and bioactive elements for growth and development in addition to safeguarding them against infectious diseases. Failure to breastfeed adequately has the potential of causing growth disorders, causing stunting (WHO, 2023; Victora et al., 2016). In addition to exclusive breastfeeding, the provision of complementary food to stunted toddlers in this study showed that only 36.7% of stunted toddlers received complementary foods that were appropriate for recommended nutritional needs. Poor feeding behaviors are classified as direct malnutrition, which is associated with the risk for stunting (UNICEF Conceptual Framework) (UNICEF, 2021). Proper supplementary nutrients also refer to the right timing, frequency and

texture of adequate complementary foods depending on the nutritional requirements of the baby. (WHO, 2023). The complementary feeding period is the phase of the first thousand days of life (1000 days) when the baby's developmental requirements expand, and these cannot be met with breast milk alone. (Stewart et al. 2013). Apart from exclusive breastfeeding and other feeding practices, stunting is also a multifactorial condition and related to parental education and income. (Black et al., 2013). It found that 60 percent of the parents of stunted toddlers have low educational attainment, and 70 percent of them low incomes. Torlesse et al. (2016) and Mulyaningsih et al. (2013) in Indonesia, both parental education and economic status are significant determinants of stunting. Moreover, higher family income is regarded as one of the major factors of lessening the incidence of stunting through access to purchasing power, health facilities and an environmental support system (Smith & Haddad, 2015). (Sari et al., 2010) (Zulfa and Sari, 2020) One of the results from this study is that 66.7% of the households have stunted toddlers who cannot avail of adequate food due in large part to food security as a cornerstone of the food supply. Food security refers to a household's ability to obtain sufficient, safe, nutritious, sustainable, and affordable food (FAO, 2022). The study also found that, in fact, 66.7 percent of parents of stunted toddlers had not undergone nutrition education. Knowledge and attitude to feeding of infants and toddlers of mothers is based on nutrition education. (Black et al., 2013)

Energy and Macronutrients Adequacy among Stunted Childern Under Five

The 24-hour recall results showed that only 50.0% of stunted childern had normal energy intake, while the remainder experienced either excess or deficits. Long-term energy deficiency leads to an energy imbalance, stunting linear growth. This condition is one of the main mechanisms contributing to stunting, especially if it occurs during the first 1,000 days of life. According to de Onis and Branca (2016), stunting is a manifestation of chronic malnutrition resulting from inadequate nutrient intake and prolonged exposure to repeated infections. This finding is further supported by Black et al. (2013), who stated that inadequate energy intake is a direct cause of stunted growth in children in developing countries. (de Onis & Branca, 2016; Black et al., 2013)

In addition to energy intake, protein intake in stunted childern is still frequently deficient (36.7% have mild deficits, 16.7% have moderate deficits, and 6.7% have severe deficits). Protein intake plays a crucial role in tissue formation, bone growth, hormone and enzyme synthesis, and the immune system. Prolonged protein deficiency will inhibit new tissue formation, resulting in suboptimal height growth. In addition to quantity, the quality of protein consumed also significantly determines the growth process, particularly protein from animal sources, which have high biological value. Black et al. (2013) stated that improving the quality of protein consumption is one of the main interventions in preventing stunting, while de Onis and Branca (2016) explained that chronic protein deficiency contributes to impaired linear growth in children. (Black et al., 2013; de Onis & Branca, 2016)

The high percentage of protein deficiency in this study is likely related to low family income and limited access to nutritious food, as also found in this study. Households with low economic status tend to have limited access to animal protein sources such as fish, eggs, meat, and milk, resulting in children's consumption being dominated by staple foods with relatively low protein content. Research by Sari et al. (2010) showed that household expenditure on nutritious food is related to children's nutritional status. Smith and Haddad (2015) also explained that increasing household income will improve families' ability to provide nutritious food, thus contributing to a reduction in the prevalence of stunting. (Sari et al., 2010; Smith & Haddad, 2015)

The study also showed that 36.7% of toddlers had normal fat intake, while approximately 43.3% experienced varying degrees of fat deficiency. Fat is the densest source of energy and plays a crucial role in child growth, particularly as a reserve energy source, in cell membrane formation, brain development, and in aiding the absorption of fat-soluble vitamins. Long-term fat deficiency can result in children not getting enough energy, so protein that should be used for growth is instead used as an energy source. This condition can indirectly exacerbate growth disorders in stunted toddlers. (WHO, 2023; Black et al., 2013)

Furthermore, low fat consumption in some toddlers is likely influenced by limited food variety in the household. In disaster-prone areas, families' ability to access foods rich in healthy fats, such as seafood, nuts, and animal products, can be disrupted due to reduced purchasing power and food distribution after a disaster. Food insecurity leads households to prefer cheaper foods with low energy and nutrient density. This situation can worsen children's dietary quality, even if their energy needs appear to be met. (FOA, 2022; WHO, 2024)

In contrast to protein and fat intake, the majority of children in this study had carbohydrate intakes within the normal range (46.7%), with 36.7% exceeding the normal range. This finding indicates that energy needs are largely met from carbohydrate sources such as rice and other staple foods. This consumption pattern is common in low-income households because carbohydrate-based foods are relatively inexpensive and readily available compared to high-quality protein and fat sources. As a result, even though energy needs appear sufficient, children's linear growth is not optimal. (Smith & Haddad, 2015)

Conclusion

The study shows in the West Aceh disaster areas, stunted children under 5 years have poor feeding practices for infancy, which includes low exclusive breastfeeding practice and inappropriate complementary feeding practice. Moreover, socio-economic situation in the family also can worsen such problems including the level of education and income of parents, food insecurity of household members and poor nutrition education. Dietary evaluation indicated that children were consuming insufficient energy and macronutrients (especially protein and fat). These multiple interaction factors remain the context for ongoing risk of chronic undernutrition. Targeted multidimensional nutrition interventions (e.g., related to infant feeding practices, household food security, or maternal nutrition education) will be required to mitigate stunting in disaster-affected settings.

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Author Contribution and Competing Interest

Each author made substantial contributions to this research. IRM designed the study, collected the data, analyzed the data, interpreted the results, and wrote the initial draft. RSD and LAH supervised the research process and revised the manuscript. There is no conflict of interest that could have influenced the results or interpretation of the research.

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