

Original Research

Feeding Patterns Related to Nutritional Status in Stunted Toddlers

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ABSTRACT

Background: Stunting can occur as a result of malnutrition, especially during the first 1000 days of life (HPK). Poor nutrition during pregnancy, growth, and early childhood can cause children to become stunted. The purpose of this study was to determine the relationship between feeding patterns and nutritional status in stunted toddlers at the North Klaten Community Health Center in Klaten Regency.

Methods: This study used an analytical observational design with a cross-sectional approach. The study population consisted of all mothers with stunted toddlers, totaling 234 people, using proportional stratified random sampling, resulting in a sample of 71 respondents. The research instruments used were the CFQ (Child Feeding Questionnaire) and anthropometric observation sheets. The validity and reliability of the instruments were tested in previous studies. Data were analyzed univariately and bivariate using the chi-square test.

Results: The results showed that most feeding patterns were inappropriate (69%) and the nutritional status of stunted toddlers was classified as short (56.3%). The chi-square test obtained a p-value of 0.004 ($p < 0.05$), which means that there is a significant relationship between feeding patterns and the nutritional status of stunted toddlers.

Conclusion: The study shows that the more appropriate the feeding patterns applied by mothers, the better the nutritional status of their children. Health workers need to improve education for mothers about the importance of feeding patterns appropriate for their children's age and involve nutritionists and posyandu cadres in monitoring toddler growth.

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INTRODUCTION

A nutritional problem that remains a challenge in Indonesia is stunting caused by long-term nutritional deficiencies. Malnutrition during the first 1,000 days of life affects children's height, intelligence, and productivity in adulthood (Ministry of Health, 2020). This shows that nutritional interventions must begin during pregnancy and continue until the child is two years old.

Stunting remains a serious problem among toddlers in Indonesia, caused by prolonged nutritional deficiencies, especially during the first 1,000 days of a child's life.

Stunting begins when the fetus is still in the womb and continues to affect children until they are two years old, resulting in irreversible physical growth disorders and reduced cognitive abilities and productivity in the future (Indonesian Ministry of Health, 2020). The prevalence of stunting among toddlers in Indonesia in 2018 reached 19.3%, with Central Java ranking eighth among the provinces with the highest stunting rates, at 13.9% for very short toddlers and 19.4% for short toddlers (Klaten Health Office, 2020).

Proper feeding patterns play a central role in preventing stunting because they directly determine the adequacy of macro and micronutrients that are important for child growth. Inappropriate feeding patterns, such as irregular meal frequency, monotonous and low-animal-protein diets, and portions that do not meet children's metabolic needs, significantly increase the risk of chronic malnutrition (Wilda & Desmariyenti, 2020). Recent studies show that children who do not receive the recommended diet are two to three times more likely to experience stunting than children with a balanced diet (Asniati et al., 2023; Sutrisni & Saidah, 2024).

Inappropriate feeding patterns have been shown to be negatively associated with children's nutritional status through biological mechanisms such as energy intake disorders, delayed linear growth, and a weakened immune system that makes children susceptible to recurrent infections (Khoeroh & Indriyanti, 2024). Furthermore, research by the Tegal Angus Community Health Center (2023) found that 51.8% of toddlers who were given an inappropriate diet experienced stunting, emphasizing that failure to meet nutritional needs during the critical growth period (1,000 HPK) has a permanent impact on height and brain development.

Previous research has found that mothers' knowledge and behavior in determining their children's food intake are important factors in children's nutritional status (Sari & Ratnawati, 2018). However, in many cases, mothers do not understand the concept of a balanced diet according to the Balanced Nutrition Guidelines (Ministry of Health, 2019). This study is novel because it examines the relationship between feeding patterns and nutritional status in the local context of the North Klaten Community Health Center using a cross-sectional approach with chi-square analysis. The purpose of this study was to determine the relationship between feeding patterns and nutritional status in stunted toddlers at the North Klaten Community Health Center in Klaten Regency so that the results could be used as a basis for educational interventions to improve children's nutritional quality.

MATERIALS AND METHODS

This study used an analytical observational design with a cross-sectional approach, in which data collection was conducted once at the same time to explain the relationship between feeding patterns and nutritional status in stunted toddlers. This method was chosen because it is effective in describing actual conditions and cause-and-effect relationships between variables without manipulation (Arikunto, 2019; Notoatmodjo, 2018).

The research location at the North Klaten Community Health Center in Klaten Regency was chosen based on the high prevalence of stunting in the area and preliminary study results that showed suboptimal feeding behaviors. The population consisted of all mothers with stunted toddlers, totaling 234 people, using a proportional stratified random sampling technique that produced 71 samples calculated using the Slovin formula with a 10% margin of error. Inclusion criteria included mothers who actively participated in integrated health service posts (posyandu) and had toddlers aged 0–59 months, while

exclusion criteria included toddlers with low birth weight, physical abnormalities, and mothers with low incomes below IDR 1,000,000 per month to avoid socioeconomic bias.

The research instrument consisted of a CFQ (Child Feeding Questionnaire) with 15 questions that had undergone validity testing (calculated r 0.736–0.986) and reliability testing (α 0.769–0.911) so that it could be trusted to measure feeding patterns. Additional data in the form of anthropometric measurements of toddler height were taken directly by researchers and enumerators.

Data analysis used descriptive statistics (frequency and percentage) to describe the characteristics of respondents and research variables. The chi-square inferential statistical test was used to test the relationship between feeding patterns and nutritional status at a 95% confidence level ($\alpha=0.05$). The entire research process adhered to ethical principles by applying informed consent, maintaining data confidentiality, respondent anonymity, and fairness in sample selection without discrimination.

RESULTS

Table 1. Characteristics of Respondents Based on Age, Education, Occupation, and Number of Children at the North Klaten Community Health Center (n = 71)

Characteristics	Category	Frequency (n)	Percentage (%)
Age	Early adulthood (26–35 years)	48	67.6
	Late adulthood (36–45 years)	23	32.4
Education	Basic (elementary/junior high school)	17	23.9
	Secondary (high school/vocational school)	45	63.4
	Higher (DIII/S1)	9	12.7
Occupation	Not working	38	53.5
	Working	33	46.5
Number of children	1 child	25	35.2
	2–4 children	46	64.8

Table 1 shows that most respondents were in the early adult age group (67.6%) with a secondary education level (63.4%). The majority of mothers were not working (53.5%) and had between two and four children (64.8%). These characteristics indicate that respondents have productive potential in caring for children, but some still have limited access to nutritional information due to their secondary education level.

Table 2. Characteristics of Toddlers Based on Gender and Age at the North Klaten Community Health Center (n = 71)

Characteristics	Category	Frequency (n)	Percentage (%)
Gender	Male	42	59.2
	Female	29	40.8
Age	0–2 years	6	8.5
	>2–3 years	19	26.8

Characteristics	Category	Frequency (n)	Percentage (%)
	>3–5 years	46	64.8

Table 2 shows that most of the toddlers were male (59.2%) and aged >3–5 years (64.8%). Biologically, boys are more susceptible to growth disorders than girls, so more attention needs to be paid to their nutritional intake and eating patterns. This age distribution also shows that most toddlers have entered an active growth phase that requires optimal nutritional intake.

Table 3. Distribution of Feeding Patterns and Nutritional Status of Stunted Toddlers at the North Klaten Community Health Center (n = 71)

Variable	Category	Frequency (f)	Percentage (%)
Feeding pattern	Accurate	22	31.0
	Inappropriate	49	69.0
Nutritional status	Short	40	56.3
	Very short	31	43.7

Table 3 shows that most respondents had inappropriate feeding patterns (69.0%) with the majority of toddlers classified as short (56.3%). Inappropriate feeding patterns indicate that mothers still have low nutritional knowledge in determining the type, amount, and frequency of their children's meals. This condition correlates with the high stunting rate, indicating a need for family nutrition education at the community level.

Table 4. Relationship between Feeding Patterns and Nutritional Status of Stunted Toddlers at the North Klaten Community Health Center (n = 71)

Feeding Patterns	Short n (%)	Very Short n (%)	Total n (%)	p-value	Contingency Coefficient
Exact	18 (25.4)	4 (5.6)	22 (31.0)	0.004	0.325
Not appropriate	22 (31.0)	27 (38.0)	49 (69.0)		
Total	40 (56.3)	31 (43.7)	71 (100)		

Table 4 shows the results of the Chi-square test with a *p-value* of 0.004 (<0.05), indicating a significant relationship between feeding patterns and the nutritional status of stunted toddlers. The contingency coefficient of 0.325 indicates a low level of correlation, meaning that although the relationship is significant, the effect of feeding patterns on nutritional status is also influenced by other factors such as sanitation, infectious diseases, and family economic status. These findings reinforce the importance of multi-sectoral interventions in efforts to reduce stunting.

DISCUSSION

The results of the study show that most respondents have inappropriate feeding patterns, and most toddlers are in the short stunting category. This condition indicates that mothers' feeding behaviors are not in accordance with the principles of balanced nutrition recommended by the Ministry of Health. Inappropriate feeding practices have a direct

impact on the adequacy of nutrient intake, which plays an important role in children's growth and development (Indonesian Ministry of Health, 2018; Supriasa et al., 2016).

These findings are in line with the results of a study by Pujiati, Nirnasari, and Rozalita (2021), which showed a significant relationship between feeding patterns and the incidence of stunting in children aged 1–36 months. A similar study by Simarmata (2020) also found that an unbalanced diet in children is closely related to stunting in children aged 4–6 years. Similarly, research by Mouliza and Darmawi (2022) reinforces the evidence that irregularity, lack of variety, and poor quality of food that does not meet nutritional standards increase the risk of stunting.

Several factors contributing to improper dietary patterns include low maternal knowledge of nutrition, low educational attainment, and monotonous family eating habits. Research by Sari and Ratnawati (2018) explains that mothers' lack of knowledge about diet is related to the nutritional status of toddlers. In addition, Lusrizanuri (2020) adds that low food variety and eating frequencies that are not appropriate for the child's age worsen nutritional status and increase the risk of stunting.

The implications of these research findings emphasize the importance of family-based educational interventions to improve mothers' knowledge about child nutrition. Nutrition education through posyandu activities and health cadre training can be effective strategies in improving feeding patterns (Rahmawati et al., 2020). Efforts to increase the capacity of posyandu cadres are expected to help mothers in preparing balanced nutritional menus, paying attention to food variety, and improving children's meal schedules. Continuous interventions such as this are important to reduce stunting rates in the working area of the North Klaten Community Health Center.

This study has limitations in its cross-sectional design, which cannot describe temporal cause-and-effect relationships. The children's eating patterns and nutritional status measured at a specific point in time may not necessarily represent long-term patterns. Additionally, nutritional status was measured only using height-for-age indicators without assessing daily energy and protein intake, as was also a limitation in a previous study by Pranowo (2021).

Future research should use a longitudinal or cohort design to evaluate changes in dietary patterns and nutritional status over time. Other variables such as environmental sanitation, infectious diseases, and parenting patterns also need to be taken into account as they have the potential to affect children's nutritional status (Haile et al., 2016). Health centers are expected to develop comprehensive nutrition education programs and provide training for posyandu cadres so that they are able to routinely monitor child growth and development. Collaborative efforts between health workers, local governments, and communities are expected to improve feeding patterns and reduce the prevalence of stunting in a sustainable manner.

CONCLUSION

The results showed that the majority of parents of toddlers had inappropriate feeding patterns, and most stunted toddlers were classified as short-. Inappropriate feeding patterns affected the nutritional status of toddlers, as children did not receive balanced nutrition according to their growth and development needs. This emphasizes the importance of nutrition education for mothers of toddlers so that they understand the principles of balanced nutrition and the application of proper eating patterns.

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