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The Relationship between Complementary Feeding Practices and Maternal Characteristics with Stunting in Children Aged 6–23 Months

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ABSTRACT
Background: Stunting remains a major nutritional problem among children aged 6–23 months. This study aimed to analyze the association between complementary feeding practices and maternal characteristics with stunting. Methods: This cross-sectional study involved 59 mothers with children aged 6–23 months in the Cengkareng District Health Center working area, selected through total sampling. Data were collected through structured interviews and observations. Complementary feeding practices were assessed based on food type, portion size, ingredients, texture, frequency, feeding patterns, and hygiene. Data were analyzed using the Chi-square test at a = 0.05. Results: Of the 59 children, 30 (50.8%) were stunted, and 53 (89.8%) received inappropriate complementary feeding. Maternal education could not be statistically analyzed because all respondents belonged to the same educational category. Maternal employment status (p = 0.948) and age (p = 0.288) were not significantly associated with stunting. Complementary feeding practices were also not significantly associated with stunting (Fisher's exact test, p = 0.424). Conclusion: No significant association was found between complementary feeding practices or maternal characteristics and stunting. Nevertheless, inappropriate complementary feeding was common, emphasizing the need for continued nutrition education and feeding support. The cross-sectional design precludes causal conclusions.

INTRODUCTION

Children play a crucial role as the foundation for sustainable development. Their well-being will determine the quality of life of future generations. The quality of future generations is determined by the current state of children (Situmeang et al., 2021). Indicators of child welfare, according to the 1989 Convention on the Rights of the Child (UNRC), include education, health, living standards, child protection, family care, and social connectedness (Herbowo, 2025). One

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condition related to child health indicators is stunting, which has the potential to impact the quality of life of future generations (Mu'tafi et al., 2025).

Based on the results of the 2022 Indonesian Nutritional Status Survey (SSGI), the prevalence of stunting in Indonesia reached 21.6%. This figure represents a 2.8% decrease compared to the 24.4% prevalence in 2021 and a 3.27% decrease compared to the 27.67% prevalence in 2019 (Ministry of Health of the Republic of Indonesia, 2022). Although the prevalence of stunting shows a decline, the decline that has occurred has not yet reached the target for stunting reduction expected in Presidential Decree Number 72 of 2021, namely 14% in 2024 (Sumanti, 2024).

Based on the 2022 Indonesian Nutritional Status Survey (SSGI), there was a 1.6-fold increase in the prevalence of stunting in children aged 12-23 months compared to children aged 6-11 months. This increase is due to the transition from exclusive breastfeeding to complementary feeding in children aged 6-23 months, where inadequate complementary feeding can lead to nutritional deficiencies (Intiyati et al., 2024).

Stunting remains a major nutritional problem for toddlers in Indonesia. According to the 2022 Indonesian Nutritional Status Survey (SSGI), the national prevalence of stunting reached 21.6%, although it has decreased compared to the previous year. This condition indicates that stunting remains a public health challenge that requires ongoing intervention, especially in the early period of life when growth and development processes occur very rapidly (Ministry of Health of the Republic of Indonesia, 2022). The First 1000 Days of Life (HPK), including ages 6–23 months, is a critical phase because children's energy and nutrient needs increase, while breastfeeding alone is no longer able to meet all of a child's nutritional needs (Anugrahini et al., 2024; Hartini et al., 2023; Rahman et al., 2023; World Health Organization [WHO], 2023).

Stunting has a significant impact, so efforts are needed to prevent and reduce it by paying attention to the causative factors. According to WHO (2013), stunting in children is caused by factors divided into four categories, namely family and household factors, inadequate supplementary feeding, breastfeeding, and infectious diseases (Khoiriyah & Ismarwati, 2023). Family factors are divided into home environment and maternal factors. Maternal factors play a significant role in the occurrence of stunting. There are three phases that require a significant maternal role: preconception, prenatal, and infancy to toddlerhood (Darmayanti & Puspitasari, 2021). In the preconception phase, the mother's nutritional status needs to be considered to prevent stunting so that in the prenatal phase, the mother's body is ready for fetal development. After the baby is born, for the first 6 months of life, breastfeeding alone can meet the child's nutritional needs. However, after the child is 6 months old, nutritional needs will increase so that complementary feeding is needed to meet the child's nutritional needs.

Although various studies have evaluated factors associated with stunting, studies that simultaneously analyze complementary feeding practices based on food type, portion size, ingredients, texture, frequency, feeding pattern, and hygiene, as well as maternal characteristics, in children aged 6–23 months are still limited, particularly in the context of local health services. Furthermore, variations in previous research findings suggest that the relationship between complementary feeding practices and maternal characteristics with stunting incidence may be influenced by social, cultural, and economic conditions, as well as the characteristics of the study population. Therefore, further research is needed to obtain contextual evidence regarding the

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relationship between complementary feeding practices and maternal characteristics with stunting incidence in children aged 6–23 months.

Although various studies have evaluated factors related to the incidence of stunting, most previous research still focused on one or several indicators of complementary feeding practices (MP-ASI), such as the timing of introduction, frequency of feeding, or food diversity. Some studies also evaluated maternal characteristics separately without integrating the quality aspects of MP-ASI practices comprehensively. This study differs from previous research because it assesses complementary feeding practices comprehensively based on several components, namely the type of food, quantity/portion, food ingredients, age-appropriate texture, frequency of feeding, feeding patterns, as well as the hygiene of both mother and child. In addition, this study was conducted on a specific population, namely mothers with children aged 6–23 months in the working area of the Cengkareng Subdistrict Health Center, as a context of urban primary health care services, thus providing a specific picture of the relationship between MP-ASI practices and maternal characteristics on the incidence of stunting at the community health service level.

Based on this background, this study aims to analyze the relationship between complementary feeding practices (including food type, portion size, food ingredients, feeding pattern, texture, frequency, and hygiene practices) and maternal characteristics (education level, occupation, and age) with stunting incidence among children aged 6–23 months in the working area of Cengkareng Community Health Center.

METHODS

This research method used a cross-sectional method in conducting interviews, observations, and filling out questionnaires, including a Declaration Letter of Ethical Suitability for Health Research with Decree Number 043/KEPK/UNPRI/XII/2023. This study uses a cross-sectional design, so the measurement of independent variables (complementary feeding practices and maternal characteristics) and the dependent variable (stunting occurrence) is conducted at the same time. Therefore, the design of this study can only be used to identify relationships or associations between the variables being studied, but cannot be used to determine causal relationships. The interpretation of the research results needs to consider that the occurrence of stunting is influenced by various complex factors, including biological, socio-economic, environmental, infectious disease factors, as well as parenting patterns that are not fully measured in this study.

This research was conducted at Cengkareng Health Center. The population in this study were all mothers who had babies under the age of two years. The sample in this study was 59 mothers who had babies under the age of two years (toddlers). The sampling technique in this study was carried out using a total sampling technique with a sample size according to the population of 59 children aged 6-23 months. The independent variable in this study was complementary foods where the actions taken by parents in fulfilling the nutritional needs of food consumed by children according to their age based on the type of food consumed reviewed from the type and portion of food, what food ingredients were used, patterns of feeding, complementary feeding texture, complementary feeding frequency, and maternal and child hygiene among children aged 6-23 months.

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Complementary feeding practices were assessed using a structured questionnaire covering several components: food type, portion size, ingredients used, feeding pattern, age-appropriate food texture, frequency of complementary feeding, and maternal and child hygiene practices during food preparation and feeding. Each component was assessed based on its compliance with age-appropriate complementary feeding recommendations. Complementary feeding practices were classified using a cut-off score of ≥75% for appropriate practices and <75% for inappropriate practices, consistent with the operational classification reported by Istammah et al. (2026). The questionnaire domains were informed by the complementary feeding recommendations and assessment indicators established by the World Health Organization and UNICEF (2021) and World Health Organization (2023). The questionnaire was intended to assess the appropriateness of reported complementary feeding practices among children aged 6–23 months. Each questionnaire item was scored dichotomously, with a score of 1 assigned to a practice that met the predefined assessment criteria and a score of 0 assigned to a practice that did not meet these criteria. The total score was calculated by summing the scores of all applicable items. The percentage score was obtained by dividing the total score by the maximum possible score and multiplying the result by 100. Higher percentage scores indicated greater adherence to the assessed complementary feeding practices.

The 75% cut-off score was used as an operational classification criterion, rather than as a WHO-established diagnostic cut-off. Interpretation of the findings should consider the limitations associated with questionnaire-based assessments and the operational classification criteria used in this study.

The dependent variable in this study was stunting, defined based on the length/height-for-age indicator (LAZ/HAZ), namely Panjang Badan menurut Umur (PB/U) for children aged <24 months or Tinggi Badan menurut Umur (TB/U) when applicable. Children were classified as stunted if their length/height-for-age Z-score (LAZ/HAZ) was < -2 standard deviations (SD) from the median of the WHO Child Growth Standards. Children with LAZ/HAZ ≥ -2 SD were classified as normal height-for-age. Anthropometric measurements were interpreted according to the WHO Child Growth Standards (WHO, 2006).

RESULTS

1. Univariate

The results of the univariate analysis showed that of the 59 children under two years old (toddlers) who were respondents to the study, 30 children (50.8%) experienced stunting, while 29 children (49.2%) did not experience stunting. These results indicate that the proportion of children aged 6-23 months who experienced stunting was slightly higher than children aged 6-23 months who did not experience stunting. The distribution of the two groups was relatively balanced, with a difference in proportion of 1.6%.

Table 1. Frequency Distribution of Characteristics of MPASI, Stunting, Maternal Education Level, Maternal Occupation, and Maternal Age

Respondent Characteristics	Frequency	Percentage
Stunting		
1. Stunting	30	50.8

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2. No Stunting	29	49.2
MPASI		
1. Appropriate	6	10.2
2. Not appropriate	53	89.8
Mother's Education Level		
1. Low	0	000.0
2. High	59	100.0
Mother's Job		
1. Doesn't work	47	79.7
2. Work	12	20.3
Mother's Age		
1. Young	44	74.6
2. Old	14	23.7
3. Older Adults	1	1.7

Based on the pattern of providing complementary foods, most children aged 6-23 months received MP-ASI in the inappropriate category. A total of 53 children (89.8%) received inappropriate MP-ASI, while only 6 children (10.2%) received appropriate MP-ASI. This finding indicates that inappropriate practices in providing MP-ASI are the dominant condition in the study respondents. The assessment of the suitability of MP-ASI in the study includes aspects of the type and portion of food, food ingredients, feeding patterns, texture, frequency, and cleanliness of mothers and toddlers. The results showed that all respondent mothers had a high level of education, namely 59 people (100.0%), while there were no respondents with a low level of education.

Thus, the variable of maternal education level does not show any categorical variation in the study population. Based on employment status, the majority of mothers in the study were unemployed. A total of 47 mothers (79.7%) were unemployed, while 12 mothers (20.3%) were employed. These data indicate that almost four-fifths of the respondents were unemployed. The distribution of respondents by age shows that most mothers were in the young age category, namely 44 people (74.6%). Furthermore, 14 mothers (23.7%) were in the old age category and only 1 mother (1.7%) was included in the older adult category. Thus, the characteristics of maternal age in this study were dominated by the young age group.

2. Bivariate

a. The Relationship Between Maternal Characteristics and the Incidence of Stunting in Children Aged 6-23 Months

The results of the bivariate analysis showed that all respondent mothers were in the high education category. In this group, 29 children (49.2%) did not experience stunting and 30 children (50.8%) experienced stunting. The results showed that all 59 respondents (100.0%) were classified as having a high level of education, with no respondents in the low education category. Among mothers with a high level of education, 30 children (50.8%) were stunted and 29 children (49.2%) were not stunted. Because maternal education showed no variation across respondents, an inferential statistical test of its association with stunting could not be performed. Therefore, maternal

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education was analyzed descriptively and excluded from the bivariate association analysis. Interpretation of these results requires caution because there were no respondents in the low education category. The homogeneity of education levels results in very limited variation in exposure, thus limiting the analysis's ability to compare stunting incidence based on maternal education level.

In the group of unemployed mothers, 23 children (48.9%) did not experience stunting and 24 children did. Meanwhile, in the group of employed mothers, 6 children (50.0%) did not experience stunting and 6 children (50.0%) did. The statistical test results showed a p-value of 0.948 (>0.05). Based on these results, there was no significant relationship between maternal employment status and the incidence of stunting in toddlers. The proportion of stunting incidence in the groups of employed and unemployed mothers also showed a relatively similar distribution.

Based on maternal age, in the young age group, there were 20 children who did not experience stunting and 24 children who did, out of a total of 44. In the older age group, there were 9 children who did not experience stunting and 5 children who did, out of a total of 14 children. Meanwhile, the only respondent in the older adult group had a child who experienced stunting.

The statistical test results obtained a p-value of 0.288 (>0.05), indicating no significant relationship between maternal age and stunting incidence in toddlers. Therefore, differences in the distribution of stunting incidence in each maternal age group did not demonstrate a statistically significant relationship.

Table 2. The Relationship Between Maternal Characteristics and the Incidence of Stunting in Children Aged 6-23 Months

Variables	Stunting				Total		p-value
	No Stunting		Stunting				
	n	%	n	%	n	%	
Mother's Education Level							
1. Low	0	0.0	0	0	0	0.0	-
2. High	29	49.2	30	50.8	59	100.0	
Mother's Job							
1. Doesn't work	23	48.9	24	51.1	47	100.0	0.948
2. Work	6	50.0	6	50.0	12	100.0	
Mother's Age							
1. Young	20	45.5	24	54.5	44	100.0	
2. Old	9	64.3	5	35.7	14	100.0	0.288
3. Older Adults	0	0.0	1	1	1	6100.0	

b. The Relationship between Complementary Food Patterns and the Incidence of Stunting in Children Aged 6-23 Months

The results of the analysis of the relationship between complementary feeding and stunting incidence showed a difference in the proportion of stunting incidence based on the appropriateness of complementary feeding. In the group of children who received appropriate complementary

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feeding, 4 children (66.7%) did not experience stunting and 2 children (33.3%) experienced stunting. Conversely, in the group who received inappropriate complementary feeding, 25 children (47.2%) did not experience stunting and 28 children (52.8%) experienced stunting. Fisher's exact test was applied because the expected frequencies in the appropriate complementary feeding group were below five. The analysis yielded a two-sided p-value of 0.424, indicating that the association between complementary feeding practices and stunting was not statistically significant ($p > 0.05$). Nevertheless, the observed proportion of stunting was higher among children receiving inappropriate complementary feeding (52.8%) than among those receiving appropriate complementary feeding (33.3%). This difference should be interpreted cautiously because of the small number of children in the appropriate complementary feeding group ($n = 6$). The analysis showed that among children receiving appropriate complementary feeding, 2 out of 6 children (33.3%) were stunted, whereas among children receiving inappropriate complementary feeding, 28 out of 53 children (52.8%) were stunted. Fisher's exact test yielded a two-sided p-value of 0.424, indicating no statistically significant association between complementary feeding practices and stunting among children aged 6–23 months ($p > 0.05$). Although the proportion of stunting was descriptively higher among children receiving inappropriate complementary feeding, this difference should be interpreted cautiously because only six children were classified as receiving appropriate complementary feeding. Therefore, the findings do not provide sufficient statistical evidence to establish an association between complementary feeding practices and stunting in this study population.

Table 3. The Relationship Between Complementary Food Patterns and the Incidence of Stunting in Children Aged 6-23 Months

Variables	Stunting				Total		p-value
	No Stunting		Stunting				
	n	%	n	%	n	%	
Complementary Foods for MPASI							
1. In accordance	4	66.7	2	33.3	6	100.0	0.424
2. It is not in accordance with	25	47.2	28	52.8	53	100.0	

DISCUSSION

The association between maternal education and stunting could not be statistically evaluated in this study because all respondents (100.0%) were classified as having a high level of education. This homogeneous distribution resulted in the absence of variability in maternal education, preventing a meaningful comparison of stunting prevalence across educational categories. Although 30 children (50.8%) of mothers with high education were classified as stunted, this finding should not be interpreted as evidence that maternal education is unrelated to stunting. Previous studies have suggested that maternal education may influence children's nutritional outcomes through improved nutritional knowledge, feeding practices, and access to health information (Handayani et al., 2023; Prasetyo et al., 2023). However, the present study could not examine these associations because of the homogeneous educational characteristics of the respondents. Future studies should include participants with more diverse educational backgrounds to allow a more comprehensive assessment of the relationship between maternal education and stunting. All respondents in the

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study had a high level of education, so the homogeneity of educational characteristics likely limited exposure variation and affected the analysis's ability to detect associations with stunting incidence.

Previous research by Handayani et al. (2023) showed that maternal education is related to children's nutritional outcomes. Maternal education can influence their ability to obtain, understand, and apply information about nutrition and child health. However, the influence of education is not always direct, as children's nutritional status is also influenced by poverty, food security, parenting patterns, and various household characteristics (Handayani et al., 2023).

Prasetyo et al. (2023) also explained in a systematic review that maternal nutrition education and knowledge contribute to improved feeding behaviors and child health. However, increased maternal knowledge is not always directly followed by changes in anthropometric status because child growth is the result of the interaction of various biological, social, economic, and environmental factors (Prasetyo et al., 2023).

Education improves a person's ability to receive and interpret health information. Mothers with higher education tend to have better access to information and decision-making skills regarding food selection, complementary feeding, hygiene, utilization of health services, and monitoring child growth (Yudianti, 2020). However, formal education does not always reflect the level of nutritional literacy or the family's ability to provide nutritious food (Siti Maulida Rahmah et al., 2025). Therefore, there is not enough variation in education level to produce differences in stunting risk. The incidence of stunting in the higher education group also shows that maternal education is not the sole determinant of child growth, but must be considered alongside nutritional quality, infection, sanitation, food security, and feeding practices.

The results showed no significant relationship between maternal occupation and stunting (p=0.948). Among unemployed mothers, 23 children (48.9%) did not experience stunting, while 24 children (51.1%) experienced stunting. Among employed mothers, 6 children (50.0%) experienced stunting and 6 children (50.0%) did not experience stunting.

These results demonstrate that maternal employment does not always have a direct relationship to child growth. A study by Laksono et al. (2022) on stunting in children of working mothers in Indonesia showed that stunting is the result of the interaction of various maternal, child, and household characteristics. Therefore, employment status cannot be viewed as a single determinant, as its impact on children is highly dependent on socioeconomic conditions and the family's caregiving system (Laksono et al., 2022).

Maternal employment has two opposing mechanisms. Employment can have a positive impact by increasing household income, thus improving the family's ability to provide nutritious food and access health services (Pramita & Sumarmi, 2024). However, employment can also reduce the mother's time spent breastfeeding, preparing complementary foods, monitoring food consumption, and providing direct care (Nurhayani, 2025). Therefore, the effect of employment on children's nutritional status is highly dependent on work duration, income, family support, availability of caregivers, and the quality of parenting. Working mothers can still meet their children's nutritional needs if they have adequate family support and economic resources. Conversely, unemployed mothers may not provide optimal parenting if their families have limited economic resources and access to food.

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The results showed no significant association between maternal age and stunting in children aged 6-23 months (p=0.288). The majority of respondents were in the young age category, while the number of respondents in the older and older adult categories was relatively small.

Maternal age can be related to biological and psychological readiness, parenting experience, and decision-making ability regarding meeting children's needs. Younger mothers may have more limited parenting experience, while more mature mothers may have greater experience in child care and feeding (Agnes & Shofa Ilmiah, 2025). However, age does not operate independently because its influence can be mediated by education, parity, economic status, family support, nutritional knowledge, and access to health care facilities.

Differences in the distribution of respondents in each age category can also influence the analysis results. The older adult group in the study consisted of only one respondent, thus lacking sufficient statistical power to provide representative comparisons with other age groups (Nazwa et al., 2026). The influence of age likely occurs more through parenting experience, knowledge, maternal health, number of children, and feeding practices (Indawati, 2021). Therefore, differences in maternal age do not necessarily lead to differences in child growth if the quality of parenting and fulfillment of nutritional needs are relatively similar.

The present study found no statistically significant association between complementary feeding practices and stunting among children aged 6–23 months (Fisher's exact test, p = 0.424). Nevertheless, the proportion of stunting was descriptively higher among children receiving inappropriate complementary feeding (52.8%) than among those receiving appropriate complementary feeding (33.3%). This observed difference did not reach statistical significance and should therefore not be interpreted as evidence of an established association.

The findings should be considered in relation to the limited sample size and the unequal distribution of complementary feeding practices. Only six children were classified as receiving appropriate complementary feeding, whereas 53 children were classified as receiving inappropriate complementary feeding. This imbalance may have reduced the statistical power to detect an association. Consequently, the absence of statistical significance does not establish that complementary feeding practices have no relationship with child growth.

The small number of children receiving appropriate complementary feeding (n = 6) and the unequal distribution between feeding categories may have limited the statistical power of the analysis. Therefore, these findings should not be interpreted as evidence that complementary feeding practices are unrelated to stunting, but rather as insufficient statistical evidence to establish an association within this study population. The study showed that children who received inappropriate complementary feeding practices had a higher proportion of stunting compared to children who received appropriate complementary feeding practices. This finding suggests a tendency that the quality of complementary feeding practices is related to the growth status of children aged 6–23 months. Complementary feeding practices that do not meet the appropriate aspects of food type, texture, frequency, or nutritional adequacy can be associated with low fulfillment of children's energy and nutritional needs during the period of rapid growth.

In children receiving appropriate complementary feeding, the proportion of stunting was 33.3%, while in the group receiving inappropriate complementary feeding, the proportion reached

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52.8%. These findings indicate a tendency that inappropriate complementary feeding practices are more common among toddlers with stunting.

The WHO (2023) explains that complementary feeding is necessary when breast milk or milk alone is no longer sufficient to meet a child's full energy and nutrient needs. This period also coincides with an increased risk of growth disorders and nutritional deficiencies, making the quality of complementary foods crucial for optimal growth (WHO, 2023).

Inappropriate texture and frequency of complementary feeding may be associated with suboptimal food intake, although this relationship cannot be established as causal based on the design of this study. Food with a texture that is not appropriate for the development of a child's oral-motor skills can make it difficult for the child to accept or consume sufficient food (Mumtaz et al., 2025). Biologically, the age period of 6–23 months is a time when energy and nutrient needs increase, so that breast milk alone is no longer sufficient for a child's growth needs. Inappropriate complementary feeding practices can be associated with low intakes of protein, energy, iron, and other micronutrients that play a role in linear growth. Furthermore, providing food with a texture or frequency that is inappropriate for a child's development can reduce the amount of food consumed, potentially affecting the adequacy of daily intake. The WHO recommends providing complementary foods 2–3 times daily at 6–8 months of age and increasing to 3–4 times daily at 9–23 months of age, accompanied by nutritious snacks according to the child's needs (Hasanah et al., 2019).

Research by Yunitasari et al. (2022) on children aged 6–23 months in Indonesia shows that the quality of complementary feeding practices remains a problem. Approximately 71.14% of children met the minimum meal frequency, 53.95% met the minimum dietary diversity, but only 28.13% met the minimum acceptable diet. Higher maternal education also increased the likelihood of meeting the minimum dietary diversity (OR=5.95; 95% CI 2.17–16.34). These findings indicate that complementary feeding practices are not only related to food availability, but also maternal characteristics, household economics, access to information, and health services (Yunitasari et al., 2022).

Herman et al. (2023) also emphasized through a scoping review that providing appropriate and adequate complementary feeding is necessary to prevent malnutrition and foster healthy eating habits in children. The practice of providing complementary feeding is influenced by various complex factors, so interventions to increase the provision of complementary feeding require consideration of maternal characteristics, family characteristics, culture, food availability, and health services (Herman et al., 2023).

The effects of complementary feeding on growth can vary depending on the type of intervention. Previous research has shown that supplementary feeding education or counseling provides small but significant improvements in linear growth in food-secure populations, while supplementary feeding with or without nutrition education also has positive effects on linear growth in food-insecure areas (Andriani et al., 2025). However, some indicators of ponderal growth do not always show significant changes. This suggests that the effect of complementary feeding on child growth is highly dependent on the quality of the intervention and the context of family food security.

Previous research on fortified complementary foods for children aged 6–23 months has shown that providing fortified foods does not always result in significant changes in all

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anthropometric indicators. However, this intervention can provide benefits on micronutrient outcomes, including a reduced risk of anemia (Pane et al., 2024). This suggests that the relationship between complementary feeding and growth depends not only on a single food component, but also on the adequacy of energy, protein, micronutrients, dietary diversity, child health, and the duration of the intervention.

Complementary feeding (MP-ASI) is an increasingly important source of nutrients after six months of age. Complementary feeding must meet the principles of being timely, adequate, safe, and provided responsively. The quality of MP-ASI needs to be assessed based on quantity, frequency, age-appropriate texture, food diversity, energy and nutrient content, and hygiene in the preparation and delivery process (Lailina et al., 2025). Inadequate MP-ASI can be associated with low nutritional adequacy, which theoretically has the potential to contribute to impaired linear growth in children (Trixie Leunupun et al., 2025).

Inconsistencies in food type, portion, texture, frequency, food ingredients, and cleanliness have the potential to reduce adequate consumption and increase the risk of infection. Theoretically, and based on previous research, chronic nutritional deficiencies and infectious diseases are factors that may contribute to impaired linear growth. However, these causal mechanisms were not directly tested in this study.

CONCLUSION

This study found no statistically significant association between complementary feeding practices and stunting among children aged 6–23 months (Fisher's exact test, $p = 0.424$). Maternal employment status ($p = 0.948$) and maternal age ($p = 0.288$) were also not significantly associated with stunting. The association between maternal education and stunting could not be statistically evaluated because all respondents were classified in the high education category. Although inappropriate complementary feeding practices were observed in 53 children (89.8%), and the proportion of stunting was descriptively higher in this group, the findings did not demonstrate a statistically significant association. These results should be interpreted cautiously considering the limited sample size, unequal distribution of complementary feeding categories, and cross-sectional study design. Further research involving larger and more diverse samples, clearly documented assessment instruments, and relevant potential confounding factors is recommended. Nutrition education and support for appropriate complementary feeding remain important components of child nutrition services.

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