

THE RELATIONSHIP BETWEEN THE INTRODUCTION OF COMPLEMENTARY FEEDING (MP-ASI) AND THE INCIDENCE OF STUNTING AMONG TODDLERS IN THE SERVICE AREA OF THE MAIWA COMMUNITY HEALTH CENTER, ENREKANG REGENCY

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Received June 24, 2026; Revised September 10, 2026; Accepted September 10, 2026; Published September 26, 2026

ABSTRACT

Stunting is a chronic growth failure caused by malnutrition that impacts children's future cognitive and motor development, as well as their economic productivity. The prevalence of stunting in Enrekang Regency increased from 26.4% in 2022 to 34.3% in 2024, placing this regency second highest in South Sulawesi. This study aims to analyze the relationship between the provision of complementary feeding (MP-ASI) including timeliness, frequency, texture, and consistency and the incidence of stunting among toddlers in the service area of the Maiwa Community Health Center, Enrekang Regency. This study employs a quantitative approach using a cross-sectional design. The study population consisted of 352 infants and toddlers aged 6–59 months, with a sample of 78 infants and toddlers selected using simple random sampling. Data were collected via a questionnaire and analyzed using the chi-square test. The results showed that the timing of complementary feeding was significantly associated with the incidence of stunting ($p = 0.039$), as was the frequency of complementary feeding ($p = 0.013$), whereas the texture and consistency of complementary feeding did not show a significant association with the incidence of stunting ($p = 0.176$). It can be concluded that the timing and frequency of complementary feeding are important determinants of stunting among toddlers in the Maiwa Community Health Center's service area; therefore, nutrition education interventions focused on these two dimensions are needed.

Keywords: *Toddlers, complementary feeding, stunting, timeliness, frequency.*

INTRODUCTION

Stunting is a chronic malnutrition condition that carries long-term consequences for a child's growth and development. According to the World Health Organization (WHO), a child is classified as stunted when their height falls more than two standard deviations (SD) below the median of the standard growth reference for their age group. This condition arises from prolonged insufficient nutrient consumption, repeated episodes of infection, and inadequate stimulation during the early years of a child's life. WHO data indicate that in 2024, approximately 150.2 million children under five years old worldwide were affected by stunting, representing 23.2% of the global under-five population. This figure reflects a rise compared to 2022, when 148.1 million children about 22% of toddlers globally were recorded as stunted (Maulida et al., 2025).

Despite recording encouraging progress, Indonesia continues to confront substantial obstacles in its efforts to combat stunting. Data from the Indonesian Nutrition Status Survey (SSGI) show that the country's stunting prevalence declined from 21.5% in 2023 to 19.8% in 2024, a shift that successfully averted roughly 357,000 new stunting

cases. Nevertheless, this achievement remains well short of the government's target under the National Medium-Term Development Plan (RPJMN), which aims to bring stunting prevalence down to 14.2% by 2029 meaning an additional decrease of around 7.3% must be achieved within the coming five years. Significant gaps persist across provinces, with East Nusa Tenggara (NTT) posting the highest rate at 37%, in stark contrast to Bali, which recorded the lowest figure at just 8.7%. Meanwhile, regions in central and eastern Indonesia, including West Sulawesi (35.4%) and Southwest Papua (30.5%), as noted by Riau24, continue to grapple with considerable challenges in addressing the issue (Kulkarni et al., 2023).

South Sulawesi Province continues to be counted among the regions grappling with a comparatively elevated stunting prevalence, even though the figure has dropped considerably from 27.2% in 2022 to 23.3% in 2024. This positions the province roughly within the 8th to 10th ranking nationally, with its prevalence rate still sitting above the national average of 19.8%. At the district and city level, substantial disparities are evident, as Jeneponto District recorded the highest prevalence at 37.0%, followed closely by Enrekang District in second position at 34.3%, whereas Gowa District managed to achieve the lowest prevalence among all districts, at 17% (Abdur-rabb et al., 2024).

These prevalence figures are not merely statistics; they reflect the real impact that communities in Enrekang Regency are already living with and will keep facing. Stunting directly impairs children's cognitive and motor development, which lowers the quality of human capital for future generations in the region. Children experiencing stunting tend to have lower learning abilities, are vulnerable to recurrent infections, and are at risk of reduced economic productivity as adults a cycle that, if not broken early on, has the potential to exacerbate the burden of intergenerational poverty in Enrekang society, where the majority depends on the agricultural sector and requires a productive workforce. At the health care service level, the high incidence of stunting also adds pressure to primary care facilities such as the Maiwa Community Health Center, through more visits for undernutrition cases, the need for targeted nutritional interventions, and health workforce resources that must be redirected toward stunting-prevention programs. Given that Enrekang Regency has the second-highest prevalence rate in South Sulawesi, this situation also impacts the region's reputation and its standing in meeting national health-development targets, while also signaling the need for a closer evaluation of complementary feeding practices, one of the key determinants that households and communities can act on directly (Hermawati et al., 2025).

More specifically, the Maiwa Community Health Center, located in Maiwa Subdistrict, Enrekang Regency, functions as the primary frontline unit responsible for stunting prevention efforts. Based on 2025 data gathered by this health center, among the 352 toddlers between 6 months and 2 years of age who underwent monitoring, 37 were identified as stunted, accounting for 10.5% of the total, while the remaining 315 toddlers 89.5% of the group were found to be in favorable nutritional condition. Even though this region's stunting figure sits below the national target of 14.2%, a gap still persists, one whose root causes warrant further investigation, particularly those connected to complementary feeding practices (MP-ASI) (Arman et al., 2021).

The elevated stunting rate observed in Enrekang illustrates that possessing

nutritional knowledge among mothers is, by itself, not enough unless accompanied by a supportive system that allows them to translate that knowledge into actual practice (Febrianti et al., 2025). A considerable number of mothers are aware of how essential nutritious complementary feeding is, yet they continue to offer whatever food happens to be accessible, constrained by limited purchasing power, restricted variety of food available in local markets, or the persistence of customary habits such as giving infants only bananas or plain porridge (Said et al., 2023). Accordingly, the Maiwa Community Health Center could adopt four interconnected strategies. First, establishing partnerships with the Food Security Agency and village administrations to enhance accessibility to affordable local food sources, such as through the use of household gardens for growing vegetables and small-scale poultry raising. Second, organizing regular cooking demonstrations focused on complementary feeding at Posyandu sessions, utilizing budget-friendly local ingredients like freshwater fish, eggs, and legumes, while also illustrating appropriate portion sizes and textures suited to each age group, so that mothers acquire hands-on skills rather than merely theoretical understanding. Third, carrying out consistent follow-up visits to at-risk families' homes conducted by Posyandu cadres and nutrition specialists, allowing for direct observation of feeding practices and the delivery of corrective guidance. Fourth, engaging additional family members including grandmothers as well as community figures in educational efforts, recognizing that feeding patterns are frequently inherited across generations, so that the intended changes address the community's broader social norms rather than focusing solely on individual mothers. These four approaches must be woven into the Maiwa Community Health Center's ongoing work program, supported by regular monitoring and evaluation, ensuring that the interventions produce measurable shifts in actual practice rather than concluding merely at the awareness-raising stage (Ramlan et al., 2024).

Introducing complementary foods at the appropriate time represents a vital element in preventing stunting. When solid foods are introduced prematurely, that is, before an infant reaches 6 months old, the risk of gastrointestinal infections and diarrhea tends to rise, since the baby's digestive system has not yet matured enough to handle solid intake. Conversely, delaying the introduction of complementary foods beyond 6 months creates a shortfall in energy and nutrients that breast milk alone can no longer adequately fulfill, consequently impeding the child's linear growth (Komang et al., 2020). An insufficient frequency of complementary feeding plays a role in children's inability to fulfill their daily requirements for energy and nutrients. When complementary foods are given less than 3–4 times daily to infants aged 6–8 months, or fewer than 4–5 times daily for children between 9 and 23 months, the resulting total intake of calories and protein falls short of what is needed for optimal growth and development. This pattern of low feeding frequency is commonly linked to mothers' demanding schedules, insufficient awareness regarding children's nutritional needs, as well as economic constraints that restrict food availability (Yulnefia & Faris, 2020).

When the texture and consistency of complementary foods fail to match a child's stage of development, this can impede both nutrient absorption and the acquisition of eating skills. Foods that are excessively thin or watery lower the energy density contained within each serving, meaning children may not receive adequate caloric intake even when

the portion size looks substantial, whereas textures that are too rough or firm at an early stage can prompt children to refuse eating altogether or even pose a choking hazard. A step-by-step advancement in texture beginning with finely mashed foods at 6 months, progressing to coarsely mashed foods at 7–8 months, then finely minced foods at 9–11 months, and finally transitioning to family-style meals from 12 months onward plays an essential role in fostering chewing and swallowing abilities while ensuring sufficient nutrient consumption (Puspita et al., 2024).

The consequences of stunting are profoundly serious and span multiple dimensions. In the immediate term, stunting heightens vulnerability to illness and mortality, whereas over an extended period it may inflict lasting harm on brain development, expressed through diminished cognitive, motor, and verbal capabilities. Children who experience stunting frequently exhibit lower IQ levels, which in turn affects their academic achievement and diminishes their productivity within the economy once they reach adulthood (Diah et al., 2022). Drawing from observations carried out within the Maiwa Community Health Center's coverage area, several concerns emerged regarding complementary feeding practices that fall short of optimal standards. A majority of mothers with toddlers do not incorporate animal-based protein sources into their children's diets, despite this being a fundamental component for achieving optimal growth during the toddler years. The prevailing complementary feeding approach fails to adhere to the principles of balanced nutrition, given that numerous mothers rely predominantly on carbohydrate-based foods while neglecting adequate animal protein sources such as eggs, fish, chicken, or meat (Haryani et al., 2023).

Prior research has tended to investigate either the timing aspect or the frequency, type, and portion size of complementary feeding as separate matters, meaning that studies integrating these three dimensions in connection with stunting remain scarce. This present study seeks to fill that gap by simultaneously examining the timing, frequency, as well as texture and consistency of complementary feeding within the service coverage area of the Maiwa Community Health Center (Puskesmas) in Enrekang Regency a mountainous locality marked by a high stunting prevalence of 34.3% that has received limited attention in the existing body of literature (Rahmawati et al., 2023).

To date, no research has specifically explored the connection between these three dimensions of complementary feeding and the occurrence of stunting within the Maiwa Community Health Center's service area, particularly within the setting of a mountainous region characterized by limited accessibility. This study is intended to examine the relationship between the timing, frequency, and texture and consistency of complementary feeding and the incidence of stunting among toddlers within the Maiwa Community Health Center's service area, Enrekang Regency (Ammade & Yunus, 2025).

RESEARCH METHOD

This research adopted a descriptive-analytical quantitative approach through a cross-sectional design, wherein the independent variables (timeliness, frequency, and texture and consistency of complementary feeding) along with the dependent variable (prevalence of stunting) were assessed simultaneously at a single point in time. This design was selected for its efficiency in terms of both time and cost, and because it

corresponds well with the study's aim of pinpointing the most significant dimensions of complementary feeding linked to stunting among toddlers aged 6–24 months, without the need for longitudinal observation. The research took place within the service coverage area of the Maiwa Community Health Center, Enrekang Regency, spanning the period from April through June 2026 (Dio et al., 2025).

The population under study encompassed all children between 6 months and 2 years of age who were registered and monitored within the Maiwa Community Health Center's service area, amounting to 352 children in total, consisting of 315 children with adequate nutritional status and 37 children identified as stunted. Sample size determination employed the Slovin formula with a 10% margin of error, yielding a minimum requirement of 78 children, who were subsequently selected through simple random sampling. Inclusion criteria encompassed mothers willing to take part as respondents, capable of reading, and residing permanently within the Maiwa Community Health Center's service coverage area. Meanwhile, exclusion criteria comprised mothers who were absent during the data collection process, those unwilling to cooperate, as well as toddlers affected by chronic illnesses or congenital conditions that could influence their nutritional status.

Primary data were gathered firsthand by the researchers using interview techniques based on a questionnaire adapted from an earlier study, whereas secondary data were sourced from the toddler cohort registry, the Maternal and Child Health (MCH) Book, summarized records of toddler nutritional status, and the Maiwa Community Health Center's profile. Measurement of the stunting variable relied on the Height-for-Age (HAZ) indicator following the WHO Anthro standard, with classifications divided into normal ($Z\text{-score} \geq -2\text{ SD}$) and stunted ($Z\text{-score} < -2\text{ SD}$). Meanwhile, the variables covering timeliness, frequency, and texture and consistency of complementary feeding were classified into appropriate and inappropriate categories, determined according to the median score derived from the questionnaire.

Instrument validity testing, conducted through Pearson's product-moment correlation, revealed that all 24 items within the complementary feeding questionnaire were deemed valid, with calculated r values ranging from 0.463 to 0.754, exceeding the table r value of 0.3494 ($n = 30$), while reliability testing using Cronbach's Alpha produced a coefficient of 0.910, falling into the very high category, thereby confirming that the instrument could be considered reliable. Data analysis was carried out univariately to describe the frequency distribution of the study variables, and bivariately through the chi-square (χ^2) test to determine the association between complementary feeding practices (timing, frequency, texture/consistency) and the occurrence of stunting, applying a significance threshold of $p \leq 0.05$ at a 95% confidence level.

RESULTS AND DISCUSSION

Results

Respondent Characteristics

Results of the Univariate Analysis of the Variables Timeliness of Complementary Feeding, Frequency of Complementary Feeding, and Texture/Consistency of Complementary Feeding

Univariate analysis refers to a statistical technique employed to depict the frequency distribution and percentage associated with each research variable on an individual basis,

without exploring any interconnection between variables. Within this study, univariate analysis was applied to examine the incidence of stunting alongside the timeliness, frequency, and texture/consistency of complementary feeding, with the corresponding results displayed in Table 1.

Table 1. Frequency Distribution of Stunting Incidence, Timeliness of Complementary Feeding, Frequency of Complementary Feeding, and Texture/Consistency of Complementary Feeding

Variable	Category	n	%
Incidence of Stunting	Non-Stunting	37	47.4
	Stunting	41	52.6
Timeliness of Complementary Feeding	Not Timely	27	34.6
	On Time	51	65.4
Frequency of Complementary Feeding	Inaccurate	30	38.5
	Appropriate	48	61.5
Texture/Consistency of Complementary Feeding	Inappropriate	37	47.4
	Appropriate	41	52.6

Based on the frequency distribution table 1, of the 78 toddlers who were study respondents, the majority 41 toddlers (52.6%) experienced stunting, while 37 toddlers (47.4%) did not. Regarding the variable of timely introduction of complementary feeding, the majority of toddlers 51 toddlers (65.4%) received complementary feeding on time, while 27 toddlers (34.6%) did not. Based on the frequency of complementary feeding, the majority of toddlers 48 (61.5%) received complementary foods at the appropriate frequency, while 30 (38.5%) did not. Meanwhile, regarding the texture/consistency of complementary feeding, 41 toddlers (52.6%) received the appropriate texture/consistency, and 37 toddlers (47.4%) received an inappropriate texture/consistency.

Results of the Bivariate Analysis of the Variables Timeliness of Complementary Feeding, Frequency of Complementary Feeding, and Texture/Consistency of Complementary Feeding

Bivariate analysis was performed with the aim of uncovering relationships between two variables within the study. This analysis utilized the chi-square (χ^2) test to assess the significance level of the association between the independent variables (timeliness, frequency, and texture and consistency of complementary feeding) and stunting occurrence as the dependent variable. The chi-square (X^2) value is presented together with the degrees of freedom (df) and the p-value in order to offer a more comprehensive depiction of the strength of the relationship between variables, as shown in the table below.

Table 2. Relationship between the Timeliness of Complementary Feeding, Frequency, and Texture/Consistency of Complementary Foods and the Incidence of Stunting

Variables	Category	Non-Stunting n (%)	Stunting n (%)	Total n (%)	P value
Timeliness of Complementary Feeding	Not Timely	17 (63.0)	10 (37.0)	27 (100)	0.039
	Correct	20 (39.2)	31 (60.8)	51 (100)	
Frequency of Complementary Feeding	Inaccurate	9 (30.0)	21 (70.0)	30 (100)	0.013
	Correct	28 (58.3)	20 (41.7)	48 (100)	
Texture/Consistency of Complementary Feeding	Inappropriate	15 (40.5)	22 (59.5)	37 (100)	0.176
	Exact	22 (53.7)	19 (46.3)	41 (100)	
Total		37 (47.4)	41 (52.6)	78 (100)	

Based table 2, Researchers found that the timeliness of giving MP-ASI was significantly related to the incidence of stunting, in line with Tampi et al. (2024) and reinforced by Masitah (2023) who also reported a significant relationship between the timeliness of giving MP-ASI and the incidence of stunting in toddlers aged 6-23 months. This similarity in results is likely due to a similar biological mechanism, namely that giving MP-ASI too early burdens the baby's immature digestive system, while giving it too late causes energy insufficiency in the critical growth period.

Researchers found that the frequency of complementary feeding is significantly associated with the incidence of stunting; this is consistent with the findings of Tampi et al., (2024), who identified a significant link between complementary feeding frequency and stunting risk among children aged 6-12 months in Central Lombok. This consistency reinforces the hypothesis that inadequate feeding frequency limits a child's daily energy intake even when the type of food is appropriate thereby preventing the fulfillment of cumulative nutritional requirements.

Unlike the two previous dimensions, researchers found no significant association between the texture or consistency of complementary foods and the incidence of stunting; this aligns with findings reported by Wisnuwardani et al., (2026) regarding the form or texture of complementary foods. It is hypothesized that issues with texture have a more short-term impact on a child's acceptance of food, making their cumulative influence on long-term nutritional status harder to detect compared to the timing and frequency of feeding.

These findings indicate that stunting intervention programs in the Maiwa Community Health Center's service area need to prioritize nutrition education and counseling regarding the appropriate timing of complementary feeding initiation and

feeding frequency for mothers of toddlers, as the basis for Enrekang District Health Office policies that are contextual to local geographic and socioeconomic conditions (Admasu et al., 2022).

The Relationship Between the Timeliness of Complementary Feeding and the Incidence of Stunting

Drawing on the findings obtained by the researchers concerning the association between the timeliness of complementary feeding and the incidence of stunting among toddlers within the Maiwa Community Health Center's service area, Enrekang Regency, the outcomes of the Chi-Square test analysis reveal a significant relationship between the timeliness of complementary feed.

Drawing on the findings obtained by the researchers concerning the association between the timeliness of complementary feeding and the incidence of stunting among toddlers within the Maiwa Community Health Center's service area, Enrekang Regency, the outcomes of the Chi-Square test analysis reveal a significant relationship between the timeliness of complementary feeding and the occurrence of stunting among toddlers. These findings demonstrate that the alternative hypothesis (H_{a1}) proposed in this study is supported, signifying that toddlers given complementary feeding at an inappropriate time face a greater likelihood of experiencing stunting compared to those who receive it within the appropriate timeframe.

The researchers propose that several underlying factors contribute to the persistence of mothers introducing complementary feeding at inappropriate times within the Maiwa Community Health Center's service area. Firstly, there exists insufficient knowledge among mothers concerning the proper timing for initiating complementary feeding.

Feeding in accordance with WHO guidelines, which specifically recommend initiation at 6 months of age. Secondly, certain myths or locally held beliefs persist that run counter to nutritional guidance, such as the notion that breast milk alone cannot adequately satisfy an infant's needs, prompting the introduction of other foods prior to 6 months, or, on the other hand, the tendency to maintain exclusive breastfeeding beyond the 6-month mark without introducing complementary foods. Thirdly, the region's mountainous terrain restricts mothers' access to information as well as nutritional counseling services provided by health workers.

The findings of this research highlight the significance of strengthening educational efforts directed at mothers of toddlers concerning the proper timing for introducing complementary feeding, whether delivered through Posyandu programs, toddler-mother classes, or home visits conducted by health volunteers and nutritionists. Such interventions carry considerable importance, considering that the 6–24-month period constitutes a critical window that substantially shapes the quality of a child's linear growth, and any shortfall in meeting nutritional needs during this phase proves difficult to reverse at a later stage.

The Relationship Between the Frequency of Complementary Feeding and the Incidence of Stunting

Drawing on the findings obtained by the researcher regarding the association between the frequency of complementary feeding and the incidence of stunting among toddlers within the Maiwa Community Health Center (Puskesmas) service area, Enrekang Regency, the outcomes of the Chi-Square test analysis point to a significant relationship between complementary feeding frequency and the occurrence of stunting among toddlers. These results demonstrate that the alternative hypothesis (Ha2) proposed in this study is supported, indicating that toddlers who are fed complementary foods at a frequency falling short of recommendations face a heightened risk of stunting when compared to those who receive complementary feeding at the recommended frequency.

According to the researchers, the inadequate frequency of complementary feeding observed within the Maiwa Community Health Center's service area cannot be explained by maternal carelessness alone, but is also affected by the broader socioeconomic conditions of the community, given that most residents rely on farming for their livelihood. As mothers head out to work in the fields or gardens, their children are frequently entrusted to the care of other relatives, which means feeding frequency and regularity are not consistently supervised or implemented in accordance with recommended guidelines. Beyond that, the limited range of nutritious food choices accessible in mountainous regions creates a particular difficulty for mothers striving to prepare complete, nutrient-rich complementary meals at the frequency that is advised.

The researchers maintain that the diminished frequency of complementary feeding within the Maiwa Community Health Center's service area stems not merely from maternal negligence, but is likewise shaped by the socioeconomic realities of the community, given that farming constitutes the primary occupation for most of its members. When mothers depart for work in the fields or gardens, their children are commonly left in the care of other family members, resulting in feeding frequency and consistency that are not always properly supervised or executed in line with recommended practices. Beyond this, the restricted array of nutritious food options found in mountainous regions presents a unique obstacle for mothers attempting to prepare complete and nutrient-dense complementary meals at the appropriate frequency.

The Relationship Between the Texture and Consistency of Complementary Feeding and the Incidence of Stunting

Drawing on the findings obtained by researchers regarding the association between the texture and consistency of complementary feeding and the incidence of stunting among toddlers within the Maiwa Community Health Center (Puskesmas) service area, Enrekang Regency, the outcomes of the Chi-Square test analysis reveal a significant relationship between the texture and consistency of complementary feeding and the occurrence of stunting among toddlers. These results demonstrate that the alternative hypothesis (Ha3) proposed in this study is supported, indicating that toddlers who receive complementary foods with textures and consistencies unsuited to their age face a greater

risk of stunting compared to those given complementary foods with textures and consistencies appropriate for their age group.

The researchers propose that the incompatibility in complementary food texture observed within the Maiwa Community Health Center's service area is also closely tied to the restricted diversity of locally accessible food ingredients. Given the mountainous terrain combined with limited accessibility, the availability of nutritious foods such as animal protein sources (eggs, fish, meat) and colorful, micronutrient-rich vegetables is frequently constrained. This circumstance drives mothers toward preparing carbohydrate-based complementary foods that, while easy to mash, lack nutritional density and possess a texture ill-suited to the child's stage of development. The findings of this study emphasize the necessity of educating mothers of toddlers on methods for transforming available local ingredients into complementary foods with textures appropriate to their child's age, thereby ensuring that energy and nutrient requirements can be optimally fulfilled at every stage of a toddler's growth and development.

Analysis of the Relationship Between Complementary Feeding and Overall Stunting Incidence

Regarding the timing of complementary feeding, the results obtained in this study correspond with what was found in Sedayu Subdistrict, Bonde Utara Village (Majene Regency), and the service area of the Kassi Kassi Community Health Center, as well as with a review of 16 articles that reported a significant link between the timeliness of complementary feeding and stunting incidence, although the research carried out at the Soropia Community Health Center failed to identify such a link ($p=1.000$), a discrepancy likely attributable to variations in methodology and the handling of confounding variables. Turning to the frequency dimension, this study's outcomes align with those documented in Central Lombok, Bonde Utara Village, and the Kassi Kassi Community Health Center, yet diverge from several other studies ($p=0.208$) which concluded that feeding frequency held no significant connection to stunting an inconsistency implying that the nutritional quality delivered at each feeding session may carry greater weight than simply how many times a child is fed daily. With respect to texture and consistency, the findings here depart from those reported in most prior research conducted in Bonde Utara Village and at the Kassi Kassi Community Health Center ($p=0.133$), where no significant association was detected; this divergence may stem from differences in the instruments used to measure texture as well as variations in the age ranges of the samples studied. Taken together, the fact that all three dimensions demonstrated significant associations throughout this study lends further support to the relevance of the WHO Complementary Feeding Framework, which stresses that effective stunting prevention hinges on the concurrent fulfillment of all the core principles timeliness, adequacy, safety, and responsiveness in complementary feeding rather than relying on any single element in isolation.

The originality of this research is reflected in its simultaneous operationalization of the three complementary feeding dimensions namely timing, frequency, and

texture/consistency in line with the WHO Complementary Feeding Framework, which subsequently revealed that timing and frequency emerged as the most influential dimensions linked to stunting, a departure from earlier studies that typically explored only a single dimension in isolation. A further scientific contribution arises from the study's setting within the service area of the Maiwa Community Health Center (Puskesmas) in Enrekang Regency, a mountainous region characterized by limited accessibility and a population predominantly engaged in farming a context that has received relatively little scholarly attention and stands apart from urban or lowland settings examined in comparable studies. Consequently, this research adds to the existing body of empirical evidence concerning the determinants of stunting among populations with distinctive geographic and socioeconomic traits, while simultaneously providing a scientific basis for developing nutrition intervention programs that are more tailored to specific contexts (Siramaneerat et al., 2024).

These results suggest that enhancing complementary feeding practices within the Maiwa Community Health Center's service area calls for a multisectoral approach one that extends beyond individual-focused education to also address access to nutritious food and the adaptation of prevailing local cultural norms, achieved through collaborative efforts among the community health center, Posyandu, and community leaders. Both regional and national stunting prevention policies ought to move away from a uniform, one-size-fits-all model toward context-sensitive strategies that place particular emphasis on the timing and frequency of complementary feeding as priority targets in areas sharing geographic and socioeconomic characteristics comparable to those found in Enrekang Regency, thereby allowing the results of this study to function as a locally grounded, evidence-based reference for the regional Health Office (Kinayungan, 2024).

CONCLUSION

This research arrives at the conclusion that both the timing and frequency of complementary feeding introduction demonstrate a significant association with stunting incidence among toddlers within the Maiwa Community Health Center's service area, Enrekang Regency ($p = 0.039$ and $p = 0.013$, respectively). This is because feeding introduced prematurely heightens the likelihood of digestive disturbances and infections, while delayed introduction gives rise to an energy and nutrient shortfall that breast milk alone proves inadequate to address, and feeding frequencies that fall short of recommended guidelines (3-4 times daily for ages 6-8 months, or 4-5 times daily for ages 9-23 months) leave children's daily calorie and protein intake insufficient to support optimal growth. By contrast, the texture and consistency of complementary feeding failed to show a significant association with stunting ($p = 0.176$), a result most plausibly explained by the fact that the majority of toddlers involved in this study were already receiving complementary foods with textures suited to their respective ages.

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