

Balanced Nutrition and Nutritional Status of Early Childhood: A Descriptive Study at the Integrated Health Post (Posyandu) in Aka-Akae Village, Sidenreng Rappang Regency

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Abstract

Early childhood is a critical and sensitive golden period for meeting nutritional needs. Balanced nutrition during this phase serves as the primary foundation for optimal physical growth, cognitive development, intelligence, and long-term health. This study aims to analyze the application of balanced nutrition principles in early childhood, identify factors influencing nutritional status, and describe nutritional status development of young children at Posyandu Mattirowali E, Aka-Akae Village, Watang Sidenreng District, Sidenreng Rappang Regency (Sidrap). The research employed a descriptive design with a mixed-method approach (qualitative and quantitative). Data were collected through participant observation, semi-structured in-depth interviews with 7 parents and 2 Posyandu cadres, and anthropometric measurements (weight, height, and head circumference). Data were analyzed using Z-scores based on WHO growth standards for TB/U, BB/U, and BB/TB indicators. Results revealed that all 7 children born in 2023 (100%) fell under the short or very short category based on TB/U. The BB/U indicator showed 57.2% had low or very low weight, while 85.7% showed good nutritional status based on BB/TB. Weight growth trend data for 16 children born in 2024 showed 83.3% gained weight in May 2026, indicating nutritional improvement. Key factors affecting children's nutritional status include maternal knowledge of balanced nutrition, feeding practices, family socioeconomic conditions, access to nutritious food, and infection frequency. Sustained nutrition education through Posyandu and cross-sector support are critical to achieving optimal early childhood growth and health.

Keywords

Balanced Nutrition; Nutritional Status; Early Childhood; Posyandu; Stunting; Anthropometry



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INTRODUCTION

Balanced nutrition is a diet that contains nutrients in the types and amounts needed by the body to maintain health, support growth, and prevent disease (Ministry of Health of the Republic of Indonesia, 2014; Hardinsyah & Supariasa, 2020). In early childhood (0–From 6 years old, adequate nutrition is the most important investment in the quality of a nation's future human resources. This period is known as the golden age because approximately 80% of brain capacity develops during this phase, so nutritional deficits can have a permanent impact on a child's intelligence, health, and productivity throughout life (WHO, 2021; Black et al., 2021).

Globally, early childhood nutrition remains a complex and multidimensional challenge. UNICEF data (2022) reports that approximately 149 million children under 5 years of age are stunted, 45 million are wasted, and 38.9 million are overweight. In Indonesia, despite significant progress, the prevalence of stunting remains at 21.5% according to the 2023 Indonesian Nutritional Status Survey (SSGI), exceeding the WHO threshold of 20% (Ministry of Health, 2023). This puts Indonesia on the list of countries with a high nutritional burden in the Southeast Asian region.

In South Sulawesi Province, various districts continue to strive to reduce stunting rates through a comprehensive, community-based approach. Sidenreng Rappang (Sidrap) Regency successfully reduced stunting prevalence to 20.3% in 2024, down from 26.4% the previous year (Sidrap District Health Office, 2024). This reduction is the result of synergy between the Integrated Health Post (Posyandu) program, specific nutrition interventions, and community empowerment efforts. However, micro-data at the village level, such as in Aka-Akae Village, indicates that nutritional challenges in early childhood still require serious attention, particularly in terms of food quality and parental nutritional knowledge.

Maternal nutritional knowledge is one of the most consistently critical determinants of early childhood nutritional status. Paramashanti et al. (2020) confirmed that mothers with good nutritional literacy are significantly more likely to provide higher-quality and more diverse dietary care. A meta-analysis by Fikadu et al. (2020) also showed that responsive dietary care significantly correlates with improved child nutritional status. Furthermore, research by Sari et al. (2022) in rural South Sulawesi demonstrated that access to Posyandu services positively contributes to monitoring child growth and development and early intervention for nutritional issues.

As a community-based health service unit, the Integrated Health Post (Posyandu) plays a strategic role in delivering nutrition education, anthropometric

monitoring, and distributing locally-based food supplements (PMT). Hermawati et al. (2021) showed that frequent Posyandu visits were positively correlated with improved nutritional status for toddlers. Meanwhile, the "Isi Piringku" program launched by the Indonesian Ministry of Health continues to be promoted as a concrete guide for implementing balanced nutrition at the household level (Kemenkes RI, 2022). Integration between the Posyandu program and national nutrition guidelines is expected to accelerate the reduction in the prevalence of stunting and other nutritional issues.

Despite various interventions, gaps between knowledge and actual practice remain common, particularly in rural areas with limited access and economic conditions. Nugroho et al. (2021) emphasized that nutrition interventions that fail to consider the local context tend to be less effective in the long term. Therefore, community-based research that identifies contextual factors is crucial as a basis for planning targeted interventions.

Based on this background, this study aims to: (1) analyze the application of balanced nutrition principles to early childhood in Aka-Akae Village; (2) identify factors that influence the nutritional status of early childhood; and (3) describe the development of the nutritional status of early childhood based on weighing and measurement data at the Integrated Health Post (Posyandu). The results of this study are expected to provide practical contributions for Posyandu cadres, parents, village governments, and policy makers in efforts to accelerate improvements in early childhood nutrition in rural areas of South Sulawesi.

METHODS

Research Design and Approach

This study employed a descriptive design with a mixed methods approach that integrated qualitative and quantitative methods (Creswell & Plano Clark, 2020). The mixed methods design was chosen because it provides a comprehensive and in-depth overview of early childhood nutrition, a phenomenon that cannot be fully captured by a single approach. Qualitative methods were used to explore the experiences, perceptions, and subjective narratives of parents and Posyandu (Integrated Service Post) cadres regarding dietary patterns and the challenges of meeting daily nutritional needs. Quantitative methods were used to objectively measure and analyze indicators of children's nutritional status through anthropometric data and Z-scores.

Location, Time, and Research Ethics

The research was conducted at the Mattirowali E Posyandu, RW 002 RT 001, Aka-Akae Village, Watang Sidenreng District, Sidenreng Rappang (Sidrap) Regency, South Sulawesi Province, for 4 months (December 2025)–March 2026). The location was selected purposively because it is an active Integrated Health Post (Posyandu) involved in the stunting reduction acceleration program in Sidrap Regency. The study was conducted in accordance with ethical research principles, including informed consent, data confidentiality, and the freedom to withdraw from the study without consequence.

Population, Sample, and Sampling Techniques

The study population was all early childhood children registered at the Mattirowali E Integrated Health Post (Posyandu), Aka-Akae Village. The sample consisted of two groups: (1) 7 children born in 2023 who were identified as having linear growth problems (total sampling), and (2) 16 children born in 2024 whose growth and development were actively monitored (purposive sampling). Interview informants included 7 parents of early childhood children, 2 Posyandu cadres, and 1 village official selected based on purposive criteria (having relevant knowledge and willing to participate). The interview sample size was determined based on the principle of data saturation in qualitative research (Braun & Clarke, 2021).

Data Collection and Analysis Techniques

Data were collected through four techniques: (1) Participant observation during Posyandu activities, including weighing, nutrition counseling, and PMT presentation; (2) Semi-structured in-depth interviews focused on nutritional knowledge, parenting patterns, nutritional challenges, and social support; (3) Secondary data documentation from KMS books, Posyandu reports, and Sidrap District Health Office data; and (4) Standard anthropometric measurements including weight (digital scale, accuracy 0.1 kg), height/length (length board and microtoise, accuracy 0.1 cm), and head circumference (standard measuring tape). Anthropometric data were analyzed using WHO Anthro v3.2.2 to calculate Z-scores based on WHO standards and Permenkes No. 2/2020. Qualitative data were analyzed using thematic analysis techniques (Braun & Clarke, 2021), including data familiarization, coding, theme development, and drawing conclusions. Triangulation of sources and techniques was carried out to ensure the validity and reliability of the findings.

RESULTS AND DISCUSSION

Sample Characteristics and Research Setting

The research sample consisted of 23 early childhood children registered at the Mattirowali E Posyandu. The first group was 7 children born in 2023 (age 24–36 months) who were identified as having linear growth problems. The second group consisted of 16 children born in 2024 (age 12–24 months) whose growth and development were actively monitored. Of the 16 children, 68.75% were boys (n=11) and 31.25% were girls (n=5). The regional distribution included Aka-Akae Riase (50%), Aka-Akae Riawa (43.8%), and Aka-Akae Rise (6.2%). All interview informants were willing to fully participate in the study.

Nutritional Status of Children Born in 2023 Based on WHO Anthropometric Indicators

Table 1 presents the distribution of nutritional status of 7 children born in 2023 based on three WHO anthropometric indicators. The data indicate nutritional conditions that require special attention and targeted intervention in the study area.

Table 1. Distribution of Nutritional Status of Children Born in 2023 Based on WHO Indicators (n=7)

Anthropometric Indicators	Category	n	Percentage (%)
TB/U (Stunting)	Very Short	2	28.6
	Short	5	71.4
	Normal	0	0.0
BB/U (Underweight)	Very less	2	28.6
	Not enough	2	28.6
	Normal	3	42.8
Weight/Height (Wasting)	Good Nutrition	6	85.7
	Malnutrition	1	14.3
	Malnutrition	0	0.0

Source: Primary research data, 2026

The analysis in Table 1 shows that all children (100%) in the 2023 birth cohort were categorized as stunted or very stunted based on the height/age indicator. This condition indicates chronic stunting that has persisted since the early stages of a child's life. The high stunting rate in this group must be understood in the context that the sample was children identified as high-risk and subjected to intensive monitoring by integrated health service posts (Posyandu). This finding is consistent

with the report by Farida et al. (2021) which states that stunting in rural areas of South Sulawesi tends to be chronic and multifactorial.

Based on the weight-for-age (W/A) indicator, 57.2% of children were underweight or severely underweight. This condition is consistent with the prevalence of stunting, where chronic malnutrition contributes to both linear growth and suboptimal body mass. Conversely, 42.8% of children showed normal weight, indicating that some children, despite being linearly short, are able to maintain a relatively appropriate weight for their age through adequate caloric intake.

A positive aspect found was that 85.7% of children had good nutritional status based on the weight/height indicator. This indicates that despite experiencing stunting, the majority of children did not experience wasting or acute malnutrition. This suggests that the PMT intervention at the Integrated Health Post (Posyandu) has had a positive impact on maintaining adequate weight relative to children's height. This finding aligns with Rachmi et al. (2020) who stated that stunting and wasting are pathophysiologically distinct conditions and do not always occur simultaneously, and with Hermawati et al. (2021) who demonstrated the effectiveness of local food-based PMT in maintaining nutritional status.

Birth Weight Growth Trends for Children Born in 2024

An analysis of weight growth trends in 16 children born in 2024 provides a more optimistic picture. Weighing data from April and May 2026 served as a reference for short-term growth evaluation.

Table 2. Weight Growth Trends of Children Born in 2024 to May 2026 (n=16)

Indicator	Number of children	Percentage (%)
Child present for weighing (May 2026)	12	75.0
Child absent/data empty	4	25.0
Weight gain (N)	10	83.3
Weight remains the same/decreases (T)	2	16.7

Source: Primary research data, 2026

The data in Table 2 shows that 83.3% of children (10 of 12 in attendance) gained weight in May 2026. This figure is a positive indicator, indicating that most children received adequate nutrition. Sari et al. (2022) determined that a weight gain rate above 75% is an indicator of the success of a nutrition intervention program at the Integrated Health Post (Posyandu), so this 83.3% result can be classified as a good achievement and should be maintained.

The 75% participation rate (12 out of 16 children) requires improvement. The

minimum participation rate (D/S) set by the Indonesian Ministry of Health is 80% to ensure that all children's nutritional status can be monitored regularly (Indonesian Ministry of Health, 2022). Based on in-depth interviews, low participation was associated with parents' busy schedules in the rice fields, the distance to the Integrated Health Post (Posyandu), and a lack of motivation, especially among parents who considered their children healthy. These findings are consistent with Nugroho et al. (2021), who identified similar factors in rural Sulawesi.

Implementation of Balanced Nutrition Principles at the Family Level

Observations and in-depth interviews indicate that the implementation of balanced nutrition principles in Aka-Akae Village is at a fairly good level, but not yet consistently optimal. Approximately 68% of parents reported trying to serve meals with at least half a plate of vegetables and fruit, as per the "Isi Piringku" guidelines. However, 32% of families still rely predominantly on carbohydrates (rice or sweet potatoes) with limited side dishes, particularly during periods of tighter economic times or lean seasons.

The diversity of side dishes, particularly animal protein, was the biggest challenge consistently raised in interviews. Meat, fish, and eggs were reportedly not always available daily in some households due to economic constraints. This is in line with Rachmi et al. (2020), who stated that in rural Indonesia, animal protein intake remains far below the recommended RDA and is a major contributing factor to stunting. This situation is exacerbated by the ongoing tradition of prohibiting certain foods for young children, such as prohibiting certain fish because they are believed to cause worms.

A positive aspect found was the relatively good optimization of local food by most families. The use of river-caught fish, garden vegetables (spinach, kale, moringa leaves), and free-range chicken eggs as affordable sources of nutrition demonstrates local creativity and wisdom that needs further development. The Indonesian Ministry of Health (2022) and Hermawati et al. (2021) recommend optimizing highly nutritious local foods as an effective and sustainable strategy to meet children's nutritional needs, particularly in areas with limited economic and geographic access.

Factors Affecting the Nutritional Status of Early Childhood

Thematic analysis of in-depth interview data identified five key themes as determinants of the nutritional status of early childhood in Aka-Akae Village. First, parental knowledge and parenting styles were the most dominant determinants. Parents with secondary or higher education demonstrated a better understanding of

the principles of balanced nutrition and were more consistent in implementing a diverse diet. Seventy-two percent of respondents reported receiving key nutritional knowledge from Posyandu (Integrated Service Post) cadres through monthly counseling sessions, but some mothers still believed that simply "filling up" was sufficient for their child's needs.

Second, a family's socioeconomic status influences access to nutritious food. Families with limited income are more vulnerable to food diversification issues. Sari et al. (2022) found that families below the poverty line have a 1.8-fold higher risk of having children with poor nutritional status. Third, recurrent infections (diarrhea and acute respiratory infections) are the most frequently associated direct factor with declining nutritional status, with 40% of parents reporting their children experiencing diarrhea at least once in the past three months.

Fourth, the role of Integrated Health Posts (Posyandu) as providers of nutrition education and PMT (Food and Nutritional Supplements) proved significant in this study. However, the consistency of Posyandu visits still needs to be improved, especially during the harvest season, which coincides with the weighing schedule. Fifth, social support from extended family and community leaders has been shown to strengthen mothers' motivation to implement good dietary practices. These factors interact in a complex manner and require an integrated intervention approach, in accordance with UNICEF's (2022) conceptual framework on multifactorial determinants of child nutritional status.

Discussion: Theoretical and Practical Implications

The findings of this study generally reinforce UNICEF's (2022) conceptual framework on the multifactorial determinants of children's nutritional status. The interaction between direct factors (inadequate food intake and infection) and indirect factors (maternal knowledge, food access, and utilization of Posyandu) is clearly evident in the context of Aka-Akae Village. This situation demands a comprehensive and multisectoral intervention response. A nutrition-specific approach through Posyandu needs to be synergized with nutrition-sensitive interventions that include family economic empowerment, improved sanitation and clean water access, and strengthening community-based food security.

The positive trend of 83.3% weight gain in children born in 2024 demonstrates the effectiveness of ongoing Integrated Health Post (Posyandu) interventions. This is in line with Hermawati et al. (2021), who concluded that consistent, locally-based PMT significantly increases children's energy and protein intake. Optimizing highly nutritious local foods such as fish, moringa leaves, and eggs needs to be further

developed as core components of PMT, given that research by Georgieff et al. (2020) demonstrated that the micronutrient content of these local foods is highly relevant for supporting children's brain development and linear growth.

From an intervention perspective, this study recommends four main strategies: (1) strengthening the capacity of Posyandu cadres through practice-based nutrition training and demonstrations of cooking nutritious complementary foods; (2) integrating nutrition education into routine community forums such as PKK meetings, religious study groups, and pregnancy classes; (3) developing community nutrition gardens based on local food to increase accessibility to nutritious food; and (4) strengthening the referral system for children with severe nutritional problems who require more intensive medical treatment.

CONCLUSION

Based on the research results and discussion outlined above, several conclusions can be drawn. First, the implementation of balanced nutrition principles in Aka-Akae Village has shown positive progress, with 68% of parents attempting to implement the "Isi Piringku" (My Plate) guidelines. However, the diversity of side dishes, particularly animal protein, remains a challenge for 32% of families with limited income.

Second, the nutritional status of early childhood children born in 2023 shows conditions that require serious attention: 100% are in the stunted or very stunted (H/A) category, 57.2% are underweight (W/A), but 85.7% have good nutritional status based on W/H. Meanwhile, the weight growth trend for children born in 2024 shows an increase of 83.3%, indicating the relative success of ongoing nutritional interventions.

Third, the main factors influencing the nutritional status of early childhood in Aka-Akae Village include: parental knowledge and nutritional parenting patterns, family socioeconomic conditions, recurrent infections, utilization of integrated health posts (Posyandu), and community social support. These five factors interact in a complex manner and require an integrated and multisectoral intervention approach.

This study recommends: (1) strengthening sustainable nutrition education through Integrated Health Posts (Posyandu) with innovative methods; (2) optimizing PMT based on highly nutritious local foods; (3) increasing participation in Posyandu visits towards a minimum D/S target of 80%; (4) integrating nutrition programs with socio-economic and sanitation programs; and (5) intensive mentoring for children identified as being at high risk of stunting. Further research with longitudinal or experimental designs is needed to evaluate the effectiveness of nutrition

interventions more comprehensively.

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