
Analysis of The Implementation of The Early Child Growth and Nutrition Detection Program Based on PAUD at The Leppangan Public Health Center

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Article history

Submitted: 2026/02/01; Revised: 2026/03/11; Accepted: 2026/04/28

Abstract

The early detection program for growth and nutrition in early childhood is a strategic effort in preventing nutritional problems, particularly stunting. This study aims to analyze the implementation of the PAUD-based early detection program for growth and nutrition in Leppangan Community Health Center. This study used a qualitative descriptive approach with data collection techniques through in-depth interviews with health workers and documentation of child growth and development monitoring results. The results showed that the program has been implemented through integrated health service posts (Posyandu), visits to PAUD, and community health center services using standard anthropometric indicators (weight/age, height/age, weight/height, BMI/age). The monitoring results showed that the majority of children were in the well-nourished category, but cases of malnutrition and stunting were still found. The main obstacles include limited resources and family economic factors. Efforts made include education, providing supplementary food, home visits, and strengthening the role of Posyandu cadres. This study concluded that the program has been running structurally, but not optimally functionally, so that strengthening cross-sector collaboration and a family-based approach is needed.

Keywords

Early detection, child nutrition, PAUD, stunting, community health center



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INTRODUCTION

Nutritional issues in early childhood remain a strategic issue in human resource development, particularly in developing countries like Indonesia.

Suboptimal nutritional status in early life, particularly during the First 1,000 Days of Life (HPK), significantly contributes to impaired growth and development in children. Stunting, an indicator of chronic growth disorders, not only impacts physical aspects but also has implications for cognitive development, learning abilities, and future productivity (Ministry of Health of the Republic of Indonesia, 2022). This condition ultimately has the potential to reduce the quality of the next generation and become an obstacle to long-term national development.

Conceptually, stunting is not a single problem caused by nutritional deficiencies alone, but rather a multidimensional phenomenon influenced by various factors. Research shows that the causes of stunting include suboptimal parenting, low-quality nutritional intake, limited access to health services, and family socioeconomic conditions (Hadi et al., 2021). Furthermore, environmental factors such as poor sanitation and low parental education also contribute to the high prevalence of nutritional problems in early childhood. This demonstrates that addressing nutritional issues requires a comprehensive and cross-sectoral approach.

In this context, early detection of child growth and development is a crucial preventive strategy. Early detection allows for the identification of growth and developmental problems at an early stage, allowing for prompt and appropriate intervention. Regular early detection programs also serve as a monitoring system that provides a continuous picture of children's health and nutritional status. Therefore, the success of this program depends heavily on consistent implementation and the involvement of various stakeholders, including health workers, educators, and families.

Integrating health services with Early Childhood Education (PAUD) institutions is an innovative approach considered effective in increasing the scope of child growth and development monitoring. Through this integration, children receive not only educational services but also regular health monitoring in a structured environment. Research shows that collaboration between the health and education sectors can improve early detection of developmental issues and strengthen interventions provided to children (Wulandari & Pratiwi, 2022). This approach also aligns with the concept of holistic-integrative services, which places the child at the center of various interconnected interventions.

However, the implementation of early detection programs in the field still faces various challenges. Low community participation, particularly among parents, is a major obstacle to program implementation. Many parents are not yet fully aware of the importance of regularly monitoring their children's growth and development.

Furthermore, limited healthcare resources, both in terms of number and capacity, also hinder reaching all program targets (Suryani et al., 2021). This situation is exacerbated by geographic and socioeconomic factors that also affect community access to healthcare services.

On the other hand, although various policies and programs have been designed by the government, there is often a gap between policy planning and implementation on the ground. A well-designed program conceptually may not run optimally without adequate resources and active community participation. Therefore, empirical studies are needed that can concretely describe how early detection programs are implemented, including the supporting and inhibiting factors.

Based on this background, this study aims to analyze the implementation of an early childhood growth and nutrition detection program based on early childhood development at the Leppangan Community Health Center. This analysis covers aspects of program implementation, indicators used in nutrition assessments, monitoring results, obstacles encountered, and efforts made to overcome these obstacles. The results of this study are expected to contribute to the development of policies and practices for implementing more effective early childhood growth and development programs, particularly in efforts to improve the quality of early childhood growth and development.

METHODS

2.1 Research Design and Approach

This study employed a mixed methods design with a concurrent triangulation approach, integrating qualitative and quantitative data simultaneously to gain a comprehensive understanding of the implementation of the early detection program for growth and nutrition in early childhood at the Leppangan Community Health Center. This design was chosen based on the multidimensional nature of nutrition issues, which require a method capable of capturing the complexity of the phenomenon holistically (Creswell & Creswell, 2022). The qualitative component aims to describe the program implementation process, obstacles encountered, and efforts made by health workers, while the quantitative component is used to analyze the distribution of children's nutritional status based on anthropometric data.

2.2 Location and Time of Research

The study was conducted in the working area of the Leppangan Community Health Center, Pinrang Regency, South Sulawesi Province, which includes four target villages: Mattiro Ade Village, Leppangang Village, Pincara Village, and Massewae Village. The

location selection was carried out purposively, considering that the Leppangan Community Health Center actively implements an early detection program for child development integrated with early childhood education institutions and has representative monitoring data. Data collection was carried out in August 2025, coinciding with the routine monitoring period for child development in the area.

2.3 Research Subjects

The research subjects consisted of two components. First, in the qualitative component, the research informants were health workers assigned to the child growth and development and nutrition monitoring program at the Leppangan Community Health Center, selected by purposive sampling with the following inclusion criteria: (a) active health workers directly involved in the implementation of the early detection program and (b) having at least one year of experience in the program. Second, in the quantitative component, the secondary data source was the results of growth and development monitoring of 26 children aged 1–6 years registered in the monitoring program in the four villages in the period of August 2025, with the inclusion criteria being children who had complete anthropometric data (BW, TB, and date of birth) and were domiciled in the working area of the Leppangan Community Health Center.

2.4 Data Collection Instruments and Techniques

The research instruments comprised two types. For the qualitative component, the primary instrument was a semi-structured interview guide that covered program implementation dimensions, nutrition assessment indicators, implementation constraints, and response efforts. For the quantitative component, the instruments used included standard anthropometric monitoring forms (weight scales, length/height measuring instruments) and the WHO Child Growth Standards z-score table (WHO, 2020) as a reference for nutritional status classification.

Data collection techniques were carried out in three ways: (1) semi-structured in-depth interviews with health workers; (2) documentation studies of secondary data in the form of records of child anthropometric monitoring results, including body weight (BW), height (H), date of birth, and family socioeconomic information; and (3) non-participatory observation of the program implementation mechanism in the field. Documentation data was processed using indicators of BB/U, TB/U, and BB/TB which refer to the Indonesian Child Anthropometric Standards (Ministry of Health of the Republic of Indonesia, 2021) and WHO (2020).

2.5 Data Analysis

Data analysis was conducted in an integrated manner. The qualitative component employed the interactive model of Miles, Huberman, and Saldana (2020), which encompasses three stages: data condensation, data presentation, and conclusion drawing and verification. The quantitative component employed descriptive analysis using frequency distributions and percentages to describe children's nutritional status based on each anthropometric indicator. These data were then presented in tabular form and interpreted

narratively. The integration of the two components was carried out at the interpretation stage, where quantitative findings were used to strengthen and contextualize the qualitative findings.

2.6 Data Validity and Research Ethics

Data validity is guaranteed through Lincoln and Guba's four criteria (in Anggito & Setiawan, 2022): (1) credibility, through source triangulation and member checking; (2) transferability, by presenting a detailed description of the research context; (3) dependability, through an audit trail in the form of documentation of the analysis process; and (4) confirmability, through researcher reflexivity in minimizing subjective bias. Ethical aspects of the research include confidentiality of informant identity by using initials, obtaining informed consent from health workers before the interview, and the use of secondary data for scientific purposes.

RESULTS AND DISCUSSION

3.1 Implementation of Early Detection Program

The early childhood growth and nutrition detection program at the Leppangan Community Health Center is implemented through three main channels: integrated health service posts (Posyandu), visits to early childhood education institutions (PAUD), and direct services at the community health center. These activities include anthropometric measurements (weight, height, and head circumference), developmental screening using the Pre-Screening Development Questionnaire (KPSP), and education for parents on parenting and balanced nutrition.

This implementation model reflects an integrative approach between health services and early childhood education, which is conceptually in line with the principle of holistic-integrative services in early childhood development as mandated in Presidential Regulation Number 60 of 2013 concerning Holistic-Integrative Early Childhood Development. From the perspective of Bronfenbrenner's developmental ecology theory (in Partini, 2021), child growth and development are influenced by various environmental systems, starting from the family (microsystem), school/early childhood education (mesosystem), to health services (exosystem). Thus, the integration between the Community Health Center and Early Childhood Education (PAUD) in this program represents a form of intersystem synergy that strengthens optimal stimulation and monitoring of child growth and development.

The use of the KPSP as a developmental screening instrument demonstrates that the program has addressed two key aspects of child development: physical growth and psychosocial development. This aligns with the theoretical foundation of growth and development, which states that child development is multidimensional and interconnected across physical, cognitive, language, and socio-emotional aspects (Soetjningsih & Ranuh, 2021). The integrated parent education component within the program demonstrates the adoption of a promotive and preventive approach, which is a key strategy for preventing nutritional problems and developmental disorders from an early age.

3.2 Distribution of Children's Nutritional Status

Nutritional status assessment was conducted on 26 children aged 1–6 years using three WHO standard anthropometric indicators: Weight for Age (W/A), Height for Age (H/A), and Weight for Height (W/H). Table 1 presents complete growth and development monitoring data, while Table 4 summarizes the frequency distribution of nutritional status based on the three indicators.

Table 1. Data on Growth and Development and Nutrition Monitoring of Children Aged 1–6 Years in the Leppangan Community Health Center Work Area (August 2025)

No	Initials	BB (kg)	TB (cm)	BB/U	TB/U	Weight/Height	Note:	Village
1	MBR	15.6	97	Normal	Short	Good Nutrition	Unable	Mattiro Ade
2	ZE	12.6	91.7	Not enough	Short	Good Nutrition	—	
3	AN	14.3	93.8	Normal	Short	Good Nutrition	Unable	
4	AKH	14	93	Normal	Short	Good Nutrition	—	
5	RST	12.6	88.9	Normal	Short	Good Nutrition	—	
6	MNA	13.7	85.1	Normal	Short	Good Nutrition	—	
7	AQ	13.2	87.6	Normal	Short	Good Nutrition	Unable	
8	MR	8.2	75.8	Not enough	Short	Malnutrition	—	
9	AN	8	79.3	Very less	Short	Malnutrition	Unable	
10	ADZ	6.8	62.2	Normal	Very Short	Good Nutrition	—	
11	MAA	13.3	90.3	Normal	Very Short	Good Nutrition	—	Leppangang
12	NAZ	12	88	Not enough	Very Short	Good Nutrition	Unable	
13	HBB	10.6	82.5	Not enough	Very Short	Good Nutrition	Unable	
14	MHS	9.4	81	Very less	Very Short	Good Nutrition	Unable	
15	MNN	9.9	77.5	Not enough	Very Short	Good Nutrition	Unable	
16	Bra	7.1	67.8	Not enough	Very Short	Good Nutrition	—	
17	AL	11.6	85.2	Normal	Very Short	Good Nutrition	Unable	Pincara
18	KHD	9.7	85	Very less	Very Short	Malnutrition	Unable	
19	APS	11.6	80.5	Normal	Short	Good Nutrition	—	

20	WMI	15.3	96.3	Normal	Short	Good Nutrition	Unable	Massewae
21	OAK	13	88.9	Normal	Short	Good Nutrition	Unable	
22	EAL	11.1	90.8	Not enough	Short	Malnutrition	Unable	
23	EJD	12.2	84.8	Normal	Short	Good Nutrition	Unable	
24	NA	10.6	81	Not enough	Very Short	Good Nutrition	Unable	
25	KM	11.6	81.7	Normal	Short	Good Nutrition	Unable	
26	Freshmen	9.4	74	Not enough	Very Short	Good Nutrition	Unable	

Source: Secondary Data from Leppangan Health Center, 2025

3.2.1 Body Weight according to Age (WW/U)

The BB/U indicator is used to describe the general nutritional condition of children and is sensitive to short-term changes in nutritional status as well as a combination of acute and chronic nutritional problems. The analysis results show that the majority of children (n = 15; 57.69%) are in the normal category based on BB/U. However, 4 children (15.38%) are in the undernourished category and 3 children (11.54%) are classified as severely undernourished (malnourished). Cases of malnutrition are spread across three of the four target villages as presented in Table 3. No cases of overweight were found during this monitoring period.

Undernutrition, based on the weight-for-age indicator, is closely related to inadequate short-term food intake and infectious diseases that affect a child's appetite (Victora et al., 2021). These findings indicate that although most children exhibit adequate weight, a significant group of children are at risk of deteriorating nutritional status if they do not receive prompt and appropriate intervention.

3.2.2 Height by Age (TB/U)

The Height/Age (H/A) indicator is the main parameter in identifying stunting, a condition of linear growth failure that reflects the accumulation of malnutrition and repeated infections over the long term (WHO, 2020). The findings on this indicator are very worrying: all 26 children (100%) monitored were below the normal category. A total of 15 children (57.69%) were classified as short (stunting) and 11 children (42.31%) were classified as very short (severe stunting). The distribution per village shows that Mattiro Ade Village has the highest number of cases (n = 10), followed by Massewae Village (n = 7), Leppangang Village

(n = 6), and Pincara Village (n = 3) as presented in Table 2.

Table 2. Distribution of the Number of Stunted Toddlers per Village in the Leppangan Community Health Center Work Area

No	Village/Sub-district	Total Measured	L	P	Total Stunting
1	Mattiro Ade	10	4	6	10
2	Leppangang	6	4	2	6
3	Pincara	3	1	2	3
4	Massewae	7	4	3	7
	Amount	26	13	13	26

Source: Secondary Data from Leppangan Health Center, 2025

The 100% stunting prevalence in this region far exceeds Indonesia's national stunting prevalence rate of 21.5% (SSGI, 2022), indicating that the Leppangan Community Health Center's work area is a very high-burden area. This finding is consistent with the findings of Beal et al. (2020) that the determinants of stunting in Indonesia are multifactorial, including inadequate nutritional intake, suboptimal feeding practices, low sanitation and environmental hygiene, and vulnerable family socioeconomic conditions.

From the perspective of the First 1,000 Days of Life (HPK) concept, stunting is a consequence of malnutrition that persists from pregnancy to age two (Ministry of Health, 2021). This finding emphasizes that program interventions should not be limited to early postnatal detection but should begin during the preconception and pregnancy periods.

3.2.3 Body Weight According to Height (BB/TB)

The weight/height (BB/H) indicator is used to assess wasting, an acute malnutrition condition that reflects an imbalance between body weight and height at the time of measurement. The analysis showed that 14 children (53.85%) were in the normal category, 9 children (34.62%) were classified as wasting, and 3 children (11.54%) were in the severe wasting category. Thus, the total wasting prevalence in this region reached 46.15% (12 out of 26 children).

The prevalence of wasting far exceeds the global emergency threshold of 15% set by the WHO as the threshold for emergency intervention (WHO, 2020). The co-occurrence of stunting and wasting in the same child significantly increases the risk of child mortality (UNICEF/WHO/World Bank, 2023) and requires immediate, integrated nutritional interventions. Tables 3 and 4 present the distribution of malnutrition per village and a summary of the frequency distribution of nutritional status based on the three indicators.

Table 3. Distribution of the Number of Undernourished Toddlers per Village in the Leppangan Health Center Working Area

No	Village/Sub-district	Total Measured	L	P	Malnutrition
1	Mattiro Ade	10	4	6	2
2	Leppangang	6	4	2	0
3	Pincara	3	1	2	1
4	Massewae	7	4	3	1
	Amount	26	13	13	4

Source: Secondary Data from Leppangan Health Center, 2025

Table 4. Frequency Distribution of Children's Nutritional Status Based on Anthropometric Indicators

Indicator	Category	n	Percentage (%)	Nutritional Problems	Classification
BB/U	Normal	15	57.69	—	Good
	Malnutrition	4	15.38	Underweight	Alert
	Severely Undernourished (Malnutrition)	3	11.54	Severely Underweight	Critical
TB/U	Short (Stunting)	15	57.69	Stunting	Critical
	Very Short (Severe Stunting)	11	42.31	Severe Stunting	Critical
Weight/Height	Normal	14	53.85	—	Good
	Thin (Wasting)	9	34.62	Wasting	Alert
	Severe Wasting	3	11.54	Severe Wasting	Critical

Source: Secondary Data from Leppangan Health Center, 2025; processed by researchers based on WHO (2020) and Indonesian Ministry of Health (2021) standards.

3.3 Program Implementation Constraints

Based on in-depth interviews and observations, the implementation of the early detection program faces multidimensional obstacles encompassing behavioral, knowledge, socioeconomic, and technical aspects of the field. First, low awareness and participation of some parents in integrated health service posts (Posyandu) activities and routine check-ups at community health centers (Puskesmas). Within the Health Belief Model framework (Rosenstock, in Notoatmodjo, 2021), individual health behavior is influenced by perceptions of vulnerability, severity, benefits, and barriers. Parents who do not regularly take their children to Posyandu may not have a strong perception of the urgency of early detection, resulting in a decreased level of involvement in the program.

Second, limited nutritional knowledge among some parents regarding the principles of balanced nutrition, children's nutritional needs, and appropriate feeding patterns directly impacts the quality of food provided to children. This condition reflects the health literacy gap in society, which, in a study by Titaley et al. (2020), was shown to be significantly correlated with stunting in Indonesia. Third, limited family socioeconomic conditions affect the ability to provide a diverse and high-quality nutritious diet. In the theory of social determinants of health (WHO, 2020), poverty is a structural factor that limits access to nutritious food, health services, and a healthy environment.

Fourth, technical challenges such as uncooperative children during anthropometric measurements can impact the accuracy of the data obtained. This condition is common in early childhood, who are in the egocentric phase and have limited understanding of examination procedure instructions (Soetjningsih & Ranuh, 2021). This highlights the importance of adaptive communication skills and a child-friendly approach from healthcare professionals in improving service quality.

3.4 Handling Efforts

The Leppangan Community Health Center has addressed implementation challenges through several strategic efforts. First, education and counseling for parents regarding balanced nutrition, appropriate parenting patterns, and the importance of early detection are carried out through integrated health service posts (Posyandu), parent meetings at early childhood education centers (PAUD), and direct counseling. These efforts to increase nutritional literacy are a form of intervention to change behavior, which, in health promotion theory, is believed to be key to successful long-term health behavior change (Green & Kreuter, in Notoatmodjo, 2021).

Second, collaboration with early childhood education institutions (PAUD) is an effective strategy for expanding the program's reach across sectors. This collaboration reflects a holistic and integrative intervention approach that allows for more routine growth and development monitoring within the context of everyday education. Third, home visits are conducted specifically for children at risk of nutritional problems or who do not regularly attend integrated health post (Posyandu) activities, providing space for more personalized and contextualized education tailored to each family's circumstances.

Fourth, the Supplementary Feeding (PMT) program is implemented for children with malnutrition as a direct intervention to help meet short-term nutritional needs. However, from a nutritional theory perspective, PMT is a temporary intervention and does not address the root cause of the problem unless accompanied by changes in dietary patterns at the family level (Victoria et al., 2021). Fifth, optimizing the role of integrated health post (Posyandu) cadres as agents of change in the community is a crucial strategy, given that the cadres' close social proximity to target families allows for more effective education and motivation. Overall, the efforts undertaken reflect a fairly comprehensive approach. However, the long-term success of the program depends heavily on its sustainability, the level of community participation, and strengthening the capacity of families to independently maintain children's health and nutrition.

CONCLUSION

The early childhood growth and nutrition detection program based on early childhood education (PAUD) at the Leppangan Community Health Center has been running

in a structured manner through integrated health posts (Posyandu), early childhood education visits, and community health center services, using standardized anthropometric measurement instruments and developmental screening. However, anthropometric findings revealed a very worrying condition: all 26 children (100%) monitored experienced stunting (57.69% were short and 42.31% were very short), while the prevalence of wasting reached 46.15%. This condition far exceeds the WHO threshold and national prevalence, categorizing the Leppangan Community Health Center's work area as an area with a double burden of malnutrition that requires immediate attention and intervention.

Key obstacles include low parental awareness and participation, limited nutritional knowledge, vulnerable socioeconomic conditions, and technical limitations in measurement. Efforts by community health centers (Puskesmas) through education, cross-sector collaboration with early childhood education institutions (PAUD), home visits, PMT (Food and Nutritional Supplement Program), and empowerment of integrated health post (Posyandu) cadres are trending in the right direction, but require more systematic and sustainable implementation.

CONCLUSION

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