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Balanced Nutrition Health Education for Infants and Toddlers Increase Parental Knowledge in Preventing Stunting

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Abstract

Stunting is caused by chronic malnutrition that affects Indonesian children, leading to long-term cognitive, physical, and socio-emotional consequences. Families play a crucial role in providing balanced nutrition to prevent stunting, yet many parents lack the necessary knowledge, necessitating targeted educational interventions. This study assesses the effectiveness of a balanced nutrition education program in enhancing parental knowledge and awareness of stunting prevention among families with infants and toddlers. Using a one-group pre-test and post-test design, 111 mothers participated in the study. Baseline knowledge was assessed through a structured questionnaire. An educational intervention, delivered through discussions, demonstrations, and audiovisual tools, focused on balanced nutrition principles and practical applications. Post-intervention knowledge levels were reassessed, and changes were analyzed using a paired t-test. Parental knowledge significantly improved post-intervention, with the proportion of respondents with good knowledge increasing from 27.03% to 79.28%. Factors influencing outcomes included parental motivation, availability for caregiving, and routine health post-visits. First-time parents and those unemployed showed higher engagement and receptivity. Tailored health education effectively enhances knowledge of stunting prevention. Interactive methods and audiovisual tools are recommended, alongside policies supporting routine counseling and culturally sensitive approaches to address educational gaps and promote optimal nutrition practices.

Keywords: Balanced nutrition, child stunting prevention, health education, parental knowledge.

1. Introduction

Stunting, defined as impaired growth and development due to chronic malnutrition during early childhood (Montenegro et al., 2022), represents a critical global health challenge (Berti & La Vecchia, 2023). This condition affects physical stature and hampers cognitive, physical, and socio-emotional development, significantly impacting an individual's long-term quality of life (Welis, Darni, Khairuddin, Rifki, & Chaeroni, 2022). In Indonesia, the prevalence of stunting remains alarmingly high, reported at 21.6% in 2022 (Laksono et al., 2024; Miranda et al., 2023). This indicates that a substantial number of children are at risk of delayed

growth and developmental deficits due to inadequate nutrition (Windiani, Agustini, Adnyana, Soetjiningsih, & Murti, 2021).

Addressing stunting requires a multi-stakeholder approach (Ridwan, 2022; Saleh, Balqis, Darmawansyah, Razak, & Syafar, 2024) involving governments (Prasetyo et al., 2023), healthcare professionals, and families (Ibrahim, Leus, Ngatmono, & Dewi, 2024; Suhita, Winduro, & Raharjo, 2023). Families play a pivotal role in adopting proper childcare practices, particularly in providing balanced nutrition during infancy and toddlerhood (Ningsih, Yuswatiningsih, & Prasetyaningati, 2024). However, many parents lack adequate knowledge about the importance of balanced nutrition in these critical early years (Perangin-angin, Asril, & Paramita, 2023), which contributes to the persistent prevalence of stunting. The knowledge gap underscores the need for targeted educational interventions to enhance family awareness and capacity to provide optimal nutritional care (Crowley, Ball, & Hiddink, 2019).

Efforts to mitigate stunting must include comprehensive health education and socialization programs that are accessible, engaging, and tailored to the specific needs of families (Rahmadiyah, Sahar, Widyatuti, Sartika, & Hassan, 2024). These programs should emphasize the principles of balanced nutrition and practical strategies for preventing stunting. Such initiatives hold the potential to empower families to take active roles in improving the nutritional status of their children, thereby reducing the prevalence of stunting and its long-term consequences.

While extensive research has examined the relationship between stunting and nutrition (Emilia, Pratiwi, Akbar, & Melayoga, 2023; Ismawati, Soeyonoa, Romadhoni, & Dwijayanti, 2020; Napitupulu et al., 2024) and sanitary and hygiene (Agustin, Lestari, & Kurniasanti, 2024), gaps remain in understanding the effectiveness of family-focused nutritional education programs. Specifically, limited studies have evaluated the impact of tailored educational interventions for families with infants and toddlers, particularly in Indonesia. Furthermore, the lack of evidence on the most effective strategies for enhancing family awareness and knowledge in this context necessitates further investigation.

This study aims to address these gaps by assessing the effectiveness of a balanced nutrition education program in increasing family awareness and knowledge about stunting prevention among families with infants and toddlers. Ultimately, this study seeks to contribute valuable insights into designing and implementing effective health education strategies that can drive significant improvements in nutritional practices and reduce the burden of stunting in Indonesia.

2. Method

This study employed a quantitative experimental design using a one-group pre-test and post-test approach to evaluate the impact of balanced nutrition education on maternal knowledge. The research was conducted with 111 respondents, comprising mothers of infants and toddlers. The primary objective was to assess the participants' baseline knowledge of balanced nutrition, deliver a tailored educational intervention, and measure the subsequent changes in knowledge as a strategy for stunting prevention.

The data collection process involved administering a structured questionnaire consisting of two parts. The first part captured demographic information, including the age and birth weight of the child. The second part assessed the mothers' knowledge of balanced nutrition, with specific questions designed to evaluate their understanding of essential nutritional practices for infants and toddlers. Following the pre-test, participants received a targeted educational intervention focusing on the principles of balanced nutrition, its importance for child development, and practical applications in daily life.

Post-intervention, the same questionnaire was administered to gauge changes in knowledge levels. The collected data were statistically analyzed using a paired t-test to determine the effectiveness of the educational intervention. This method allowed for the measurement of significant differences in maternal knowledge before and after the intervention, providing robust evidence of the program's impact on enhancing awareness of balanced nutrition as a preventive measure against stunting.

3. Results and Discussion

Table 1. The Respondent Characteristics

Variable	Frecuency	Percentage
Age		
12-24 month	46	41,4
25-36 month	39	35,1
37-48 month	35	13,5
49-59 mont	11	9,9
Gender		
Male	46	41,4
Female	65	58,6
While based on the birth of children		
Fisrt	39	35,1
Second	52	46,8
Third	19	17,1
Fourth	1	0,9
Parental Employment:		

Employee	38	34,2
Unempoyee	73	65,8
Parental Education		
Low Education	105	94,6
High Education	6	564
N	111	100

The demographic characteristics of the children involved in the study were distributed as follows: the majority of participants (51.4%) were aged 12–24 months (n=46), followed by 37–48 months (35.1%, n=39), 25–36 months (13.5%, n=15), and 49–59 months (9.9%, n=11). Regarding gender, 41.4% (n=46) were male, while 58.6% (n=65) were female. In terms of birth order, 35.1% (n=39) were first-born children, 46.9% (n=52) were second-born, 17.1% (n=19) were third-born, and 0.9% (n=1) were fourth-born.

Table 2. The Category of Parents' Knowledge About Balanced Nutrition Before and After Education

Variable	**Pretest**		**Post test**	
Knowledge	**frequency**	**Percentage**	**Frequency**	**Percentage**
Less	14	12,61	0	0
Sufficeient	67	60,36	23	20.72
Good	30	27.03	88	79,28
	111	100	111	100

The Table 2 revealed that prior to the educational intervention, parental knowledge of balanced nutrition was categorized as follows: 14 respondents (12.61%) had poor knowledge, 67 respondents (60.36%) had moderate knowledge, and 30 respondents (27.03%) demonstrated good knowledge. Post-education, a notable improvement was observed, with 23 respondents (20.72%) classified as having moderate knowledge and 88 respondents (79.28%) categorized as having good knowledge. Statistical analysis indicated a significant effect of the balanced nutrition education intervention on parental knowledge, as evidenced by a p-value of <0.005. This demonstrates that the educational intervention effectively enhanced the knowledge of parents with infants and toddlers regarding balanced nutrition.

Table 3. The Analysis Result of Knowledge Change Before and After Education

	Mean	**St Deviation**	**Side p**
Pretest	-11.000909	4.16726	<0.000
Post test			

The analysis of parental knowledge regarding balanced nutrition before the educational intervention revealed that 14 respondents (12.61%) demonstrated limited knowledge, 67 respondents (60.36%) exhibited moderate knowledge, and 30 respondents (27.03%) showed good knowledge. Post-education, a significant shift in knowledge categories was observed: 23 respondents (20.72%) demonstrated

moderate knowledge, and 88 respondents (79.28%) exhibited good knowledge. Statistical analysis yielded a p-value < 0.005, indicating that the intervention significantly improved parental knowledge of balanced nutrition for infants and toddlers.

Health education is an essential strategy for disseminating health information to enhance knowledge (Caeiros, Ferreira, Chen-Xu, Francisco, & de Arriaga, 2024). Effective health education fosters improved knowledge, skills, and the ability to adopt healthier lifestyles (Raghupathi & Raghupathi, 2020). Methods such as discussions and demonstrations have proven effective within family settings. Supporting this, research by Ginting, Simamora, & Siregar (2022) highlighted significant knowledge gains when health education utilized audiovisual media. Similarly, Blandina Wea, Hidayati, & Kristiawati (2018) reported that audiovisual health education plays a pivotal role in achieving optimal learning outcomes, aligning with this study's findings that health education effectively enhances family knowledge.

Engaging families through discussion fosters an interactive learning environment, avoiding a didactic approach and encouraging active participation in problem-solving. On the other hand, demonstrations provide hands-on experiences that reinforce understanding of the material. The observed increase in respondents was also influenced by their availability for home-based care, with 65.8% unemployed. This allowed them to focus on the education process and apply the acquired knowledge effectively. Furthermore, ample free time enabled respondents to seek additional health-related information for their infants and toddlers.

Parental motivation also played a significant role, with 35.1% of respondents being first-time parents and 46.8% caring for their second child. First-time parents exhibited high motivation to ensure optimal health for their children, while second-time parents leveraged their prior experiences to enhance their caregiving practices.

Respondent age also impacted knowledge acquisition, with 41.41% aged 12–24. This age group demonstrated a high level of curiosity and proficiency in accessing information, facilitating better comprehension. Research from Tanzania identified several factors influencing child stunting, such as maternal age below 20 years (OR = 1.15), low socioeconomic status (OR = 2.48), and limited parental education (OR = 2.02). These findings underscore the critical role of maternal knowledge in preventing stunting.

Educational attainment directly influences parental behavior in providing balanced nutrition. Educated mothers are more likely to prepare their children age-appropriate and nutritionally adequate meals. However, 94.6% of respondents in this study had low educational attainment, primarily high school graduates who had not

pursued higher education. This limitation highlights the importance of tailored health education to address gaps in nutritional knowledge and promote healthy child development.

Routine visits to health posts for counseling on child nutrition and development further improved knowledge—such interactions gave mothers the information needed to prepare age-appropriate meals and adopt optimal childcare practices. The intentional dissemination of nutritional knowledge through counseling or lived experiences proved effective in enhancing parental understanding.

Among the 111 respondents, 88 demonstrated good knowledge following the educational intervention. Age, environment, culture, education, and personal experience were identified as key determinants of knowledge acquisition. Notoatmodjo (2019) notes that age facilitates cognitive development and abstract thinking, while cultural and educational environments shape learning experiences. These elements underscore health education's importance in promoting informed caregiving practices for infants and toddlers.

5. Conclusion

This study demonstrates that health education on balanced nutrition significantly enhances parental knowledge, as evidenced by the transition from 12.61% of respondents with poor knowledge to 79.28% with good knowledge post-intervention. The findings underscore the effectiveness of discussion and demonstration methods and audiovisual media in fostering knowledge acquisition. Key factors influencing the outcomes include parental motivation, availability for caregiving, routine health post-visits, and the parents' age and education levels. Notably, unemployed parents and those with younger children or firstborns displayed higher engagement and receptivity to the educational process, leading to improved nutritional practices and awareness.

Future health education initiatives should prioritize interactive and hands-on methods, integrating audiovisual tools to optimize learning outcomes. Tailored programs are essential to address educational gaps among parents with low formal education levels, particularly in regions with limited access to higher education. Policymakers and healthcare providers should emphasize regular counseling sessions at health posts to support sustained knowledge improvement. Additionally, targeted interventions for first-time and younger parents and culturally sensitive approaches can further enhance family awareness and efforts to prevent stunting in infants and toddlers.

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