



Comparison of Nutrition Education using Emodemo and Leaflet Media on Knowledge and Attitudes among Mothers of children aged 6–24 months with Wasting

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ABSTRACT

Wasting is a growth disorder characterized by a mismatch between a child's weight and height or length. Mothers' knowledge and attitudes are indirect factors causing wasting. Various educational media have been used in community-based nutrition programs to deliver health messages to mothers. This study analyzes differences in mothers' knowledge and attitudes after nutrition education using Emotional Demonstration (Emodemo) and Leaflet media among mothers of children aged 6–24 months with wasting. This study employed a quasi-experimental design. was conducted in the working area of Banjar PHC, Indonesia. The study population consisted of mothers who had children aged 6–24 months diagnosed with wasting. The sample consisted of 36 respondents. The intervention consisted of two media types: leaflet- and Emotional Demonstration (Emodemo)-based nutrition education over four weeks. The instruments included a multiple-choice questionnaire to measure knowledge and a Likert-scale form to assess attitudes. Data were analyzed using the Mann-Whitney test. The results showed a significant difference in mothers' knowledge after nutrition education using Emodemo media than leaflet media ($p = 0.002$). However, no significant difference in mothers' attitudes after nutrition education using both media ($p = 0.062$). In conclusion, Interactive educational strategies, such as Emodemo, can be an effective way to increase mothers' knowledge in community nutrition programs. Nevertheless, changes in mothers' attitudes may require longer intervention periods, repeated educational exposure, and continuous behavioral support. Future research should conduct follow-up measurements several weeks or months later to assess retention and behavioral changes over time.

INTRODUCTION

Child wasting remains a major global public health problem affecting millions of children under five years of age. Children aged 6-24 months are particularly vulnerable to wasting because this period represents a critical stage of growth and development. During this stage, infants transition from exclusive breastfeeding to complementary feeding, which requires a diverse diet, adequate nutrient intake, and proper feeding practices. Inadequate complementary feeding practices during this critical period can significantly contribute to the development of acute malnutrition (UNICEF, WHO, and World Bank Group, 2025).

According to joint estimates from the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), and the World Bank, the number of children with wasting was approximately 45 million children under 5 worldwide, representing 6-7% of the global child population (UNICEF, WHO, and World Bank Group, 2025). Wasting is characterized by low weight-for-height and reflects acute malnutrition resulting from inadequate dietary intake, disease, or both. Children with wasting have a significantly higher risk of mortality, impaired immune function, and delayed physical and cognitive development (UNICEF, WHO, and World Bank Group, 2025). In Indonesia, child wasting continues to be a significant

nutritional challenge despite improvements in several indicators of child health. Data from the Indonesian Nutritional Status Survey (SSGI) reported that the national prevalence of wasting ranged from approximately 6.1% to 7.7%, depending on regional conditions (Kementerian Kesehatan RI, 2025). Although this prevalence is slightly lower than previous estimates, the burden remains substantial, particularly in certain provinces and districts. Wasting prevalence in East Java Province was slightly above the national average, indicating that child malnutrition remained an important public health concern in this region (Hafifah & Baliwati, 2023). These findings highlight the need for effective interventions to improve child nutrition, especially among vulnerable groups.

Maternal knowledge and attitudes regarding nutrition play an essential role in determining child feeding practices and nutritional outcomes. Mothers with adequate knowledge of child nutrition are more likely to adopt appropriate feeding behaviors that support optimal growth and development (Achjar et al., 2023). Conversely, limited knowledge and unfavorable attitudes toward nutrition may lead to inappropriate feeding practices, such as irregular meal schedules, inadequate portion sizes, and poor dietary diversity (Majidah, Sulistiyawati, and Paramashanti, 2021). Behavioral theories also suggest that knowledge is a fundamental determinant influencing attitudes and practices related to health behaviors (Candrawati et al., 2023). Therefore, improving mothers' knowledge and practices related to child feeding is considered an important strategy to prevent wasting among young children.

Nutrition education has therefore become an important strategy for improving maternal knowledge and promoting healthy feeding practices. Various educational media have been used in community-based nutrition programs to deliver health messages to mothers. Printed educational materials, such as leaflets, are commonly used because they are practical, inexpensive, and easy to distribute in primary health care settings (Prasetyo, Permatasari, and Susanti, 2023). However, leaflet-based education often relies on passive information delivery and may not effectively engage participants during the learning process. In contrast, interactive education methods have been increasingly implemented to enhance community engagement and knowledge retention. One such method is Emotional Demonstration (Emodemo), which integrates demonstrations, visual tools, and emotional engagement to convey nutrition messages more effectively. Emodemo encourages active participation and allows participants to directly observe and practice recommended behaviors (Intiyati et al., 2024). Interactive learning approaches have been shown to improve knowledge acquisition and retention compared with traditional didactic or printed educational materials (Permatasari et al., 2021).

Previous studies have demonstrated that participatory educational strategies can significantly improve maternal knowledge of child nutrition and feeding practices (Majidah, Sulistiyawati, and Paramashanti, 2021; Achjar et al., 2023). However, evidence comparing the effectiveness of different educational media

in improving mothers' knowledge and attitudes remains limited, particularly among mothers of children experiencing wasting. Most studies have focused on general mother populations rather than targeting mothers of children who are already experiencing nutritional problems. Furthermore, limited research has directly compared the effectiveness of Emodemo and leaflet media within community health center settings, particularly in rural areas where health education resources may be constrained. Understanding the relative effectiveness of these educational strategies is important for optimizing community-based nutrition programs and improving the efficiency of health promotion activities. Therefore, this study analyzes differences in mothers' knowledge and attitudes after nutrition education using Emotional Demonstration (Emodemo) and Leaflet media among mothers of children aged 6–24 months with wasting. The findings of this study are expected to provide evidence-based recommendations for selecting effective educational strategies to improve mothers' understanding of child nutrition and support the prevention and management of wasting.

METHOD

This study employed a quasi-experimental research design with a quantitative approach to examine the effectiveness of two nutrition education media, namely Emotional Demonstration (Emodemo) and leaflets, on mothers' knowledge and attitudes regarding child feeding practices. Quasi-experimental designs are commonly used in community-based intervention studies when randomization is difficult to implement, but comparison between intervention groups is required (Creswell, 2009). The study compared two intervention groups receiving different educational approaches to compare effectiveness in improving mothers' knowledge and attitudes.

The research was conducted in the working area of Banjar PHC, located in Galis District, Bangkalan Regency, East Java, Indonesia. The study population consisted of mothers who had children aged 6–24 months diagnosed with wasting. Wasting status was determined using the weight-for-height (WHZ) or weight-for-length (WLZ) indicator with Z-scores between -3 SD and < -2 SD according to the WHO Child Growth Standards (WHO, 2006). Respondents were selected based on several inclusion criteria, including mothers who were willing to participate in the study, able to read and understand Indonesian, and had no hearing impairment that could interfere with participation in educational sessions. Exclusion criteria included mothers who did not live with their children, mothers who moved away during the study period, and children diagnosed with congenital conditions such as autism or congenital heart disease. Initially, 42 mothers met the inclusion criteria and were recruited as respondents. However, six respondents were excluded during the study period because their children's nutritional status improved to

normal according to follow-up anthropometric measurements. Therefore, the final sample consisted of 36 respondents.

Data were collected using structured questionnaires designed to assess mothers' knowledge and attitudes regarding child feeding practices. Mothers' knowledge was assessed using a multiple-choice questionnaire covering feeding schedules, portion sizes, and appropriate complementary feeding practices for children aged 6–24 months. Each correct answer was scored as 1, while incorrect answers were scored as 0. The total score reflected mothers' level of knowledge about child nutrition. In addition, mothers' attitudes were measured using a Likert-scale questionnaire comprising statements on feeding practices and nutritional care for children. Respondents indicated their level of agreement using four response categories ranging from strongly disagree to agree strongly. The Likert scale is widely used to measure attitudes in behavioral and health research (Candrawati et al., 2023).

The intervention consisted of two media types: leaflet- and Emotional Demonstration (Emodemo)-based nutrition education over four weeks. The leaflet contained printed educational information about feeding schedules and appropriate portion sizes for infants and young children. The leaflet was designed using simple language and visual illustrations to facilitate understanding among mothers with different educational backgrounds. Meanwhile, the Emodemo method used interactive demonstration modules focusing on feeding schedules and portion sizes for infants and young children. Emodemo is an educational method that integrates emotional engagement, visual demonstrations, and the respondent's involvement to enhance learning effectiveness. The educational sessions were delivered in two stages during the intervention period, allowing respondents to actively observe and practice recommended feeding behaviors.

Data were analyzed using statistical software to evaluate the effectiveness of the educational interventions. Descriptive statistics were used to summarize respondent characteristics, including mothers' age, educational level, and employment status. Inferential statistical analysis was conducted using the Mann–Whitney test to compare differences in mothers' knowledge and attitudes between the Emodemo and leaflet intervention groups. The Mann–Whitney test is a nonparametric test commonly used to compare two independent groups when the data are ordinal or nonnormally distributed (Gibbons & Chakraborti, 2011). The level of statistical significance was set at $p < 0.05$. A p -value below this threshold indicated a statistically significant difference between the two groups. Ethical approval for this study was obtained from the Health Research Ethics Committee of Universitas Nahdlatul Ulama Surabaya with approval number 0075/EC/KEPK/UNUSA/2025.

RESULT

The characteristics of the respondents included mothers' age, educational level, and employment status. It is important because mothers' demographic factors may influence their ability to receive and process health education information on child nutrition (Candrawati et al., 2023). The majority of mothers were aged 26–30 years (47%), followed by those aged 20–25 years (42%), while a smaller proportion were aged 30+ (11%). Regarding educational background, most respondents had completed senior high school (61%), followed by junior high school (22%), elementary school (11%), and higher education (6%). Regarding employment status, the majority of respondents were not formally employed and were categorized as housewives (72%), while 28% were employed (Table 1). Mothers' age and educational level may influence their understanding of nutrition information delivered during educational interventions. Mothers with higher levels of education generally have better access to health information and a greater ability to interpret nutrition messages (Achjar et al., 2023).

Table 1. The Characteristics of the Respondents by Age, Education Level, and Employment Status

The Characteristics of the Respondents	Frequency (n)	Percentage (%)
Age (years old)		
20–25	15	42
26–30	17	47
>30	4	11
Education Level		
Elementary School	4	11
Junior High School	8	22
Senior High School	22	61
Higher Education	2	6
Employment Status		
Employed	10	28
Unemployed / Housewife	26	72
Total	36	100

Before the intervention, most mothers in the Emodemo group had low knowledge (67%), while almost half had moderate knowledge (33%). After receiving Emodemo-based nutrition education, a substantial improvement was observed, with most respondents (89%) having good knowledge and a small proportion (11%) having moderate knowledge. A similar improvement was observed in the leaflet group. Before the intervention, most respondents in this group had poor knowledge (72%), while 28% had moderate knowledge. After receiving leaflet-based nutrition education, most respondents had moderate knowledge (67%), and 33% had good knowledge. Furthermore, statistical analysis using the Mann–Whitney test showed a significant difference in knowledge levels between the two groups ($p = 0.005$), indicating that the educational intervention significantly improved mothers' knowledge, particularly in the Emodemo group (Table 2). The results indicate that interactive educational methods, such as Emodemo, may lead to greater improvements in mothers' knowledge compared with passive educational media, such as leaflets.

Interactive learning approaches have been shown to enhance understanding and knowledge retention among respondents (Silva et al., 2023).

Table 2. Mothers' Knowledge Before and After Nutrition Education in the Emodemo and the leaflet groups

Mothers' Knowledge	Emodemo Group		Leaflet Group	
	Pre-test n (%)	Post-test n (%)	Pre-test n (%)	Post-test n (%)
Good	0 (0)	16 (89)	0 (0)	6 (33)
Moderate	6 (33)	2 (11)	5 (28)	12 (67)
Poor	12 (67)	0 (0)	13 (72)	0 (0)

Mann-Whitney test: $p = 0.005$

In the Emodemo group, the pre-test results indicated that respondents were equally distributed between the poor and moderate attitude categories (50% each). After the intervention, most respondents (67%) had a moderate attitude, while 33% had a good attitude. In the leaflet group, the majority of respondents (72%) already had a moderate attitude at baseline. After the intervention, most respondents remained in the moderate category (83%), although a small proportion improved to the good category (17%). However, statistical analysis showed that the difference in mothers' attitudes between the two intervention groups was not statistically significant ($p = 0.085$). The results demonstrated a descriptive improvement in attitudes in both intervention groups, although the changes were not statistically significant (Table 3). Short-term educational interventions may be more effective at improving knowledge than at modifying attitudes. Changes in attitudes often require longer exposure to educational messages and repeated reinforcement (Candrawati et al., 2023).

Table 2. Mothers' Attitude Before and After Nutrition Education in the Emodemo and the leaflet groups

Mothers' Attitude	Emodemo Group		Leaflet Group	
	Pre-test n (%)	Post-test n (%)	Pre-test n (%)	Post-test n (%)
Good	0 (0)	6 (33)	0 (0)	3 (17)
Moderate	9 (50)	12 (67)	13 (72)	15 (83)
Poor	9 (50)	0 (0)	5 (28)	0 (0)

Mann-Whitney test: $p = 0.085$

DISCUSSION

The findings demonstrated that nutrition education significantly improved mothers' knowledge, particularly in the emodemo-based education group. Before the intervention, the majority of mothers in both groups had limited knowledge regarding appropriate feeding schedules and portion sizes for children aged 6–24 months. After receiving education through Emodemo, most mothers had a good knowledge, while most respondents in the leaflet group improved only to a moderate level (Table 2). These findings suggest that interactive educational methods are more effective than passive information delivery in improving mothers' understanding of child nutrition. Interactive learning approaches encourage active

participation, facilitate discussion, and enhance retention of health information (da Silva Lopes et al., 2021).

The effectiveness of Emodemo as an interactive learning observed in this study may be due to its characteristics. Emodemo integrates visual demonstrations, emotional engagement, and participatory learning activities that enable participants to observe and practice recommended behaviors directly. Such interactive methods engage multiple sensory channels during the learning process, thereby improving comprehension and memory retention. A previous study reported that participatory nutrition education strategies could significantly enhance mothers' knowledge of child feeding practices and improve understanding of appropriate complementary feeding (Achjar et al., 2023).

The findings of this investigation are also consistent with behavioral learning theory, which emphasizes that learning outcomes are influenced by the level of engagement and interaction participants experience during educational activities. Educational approaches that involve active participation and demonstration tend to produce better learning outcomes compared with passive methods such as printed materials (Candrawati et al., 2023). In the context of community nutrition programs, interactive approaches may therefore be more effective in improving mothers' understanding of recommended feeding practices.

Although leaflet-based education also improved mothers' knowledge, the improvement was lower than in the Emodemo group (Table 2). Leaflets provide written information that can be read independently. However, their effectiveness depends largely on respondents' literacy levels and motivation. Without direct interaction or explanation, some information in leaflets may be difficult to understand fully. Similar findings have also been reported in previous studies, showing that printed educational materials alone are often less effective at changing knowledge and behavior than interactive education strategies.

In contrast to the mothers' knowledge variable, this study showed that neither Emodemo- nor leaflet-based nutrition education significantly influenced mothers' attitudes toward child feeding practices. Although descriptive improvements were observed in both intervention groups, the statistical analysis indicated that the change in attitudes was not significant (Table 3). This finding suggests that short-term educational interventions may not be sufficient to produce meaningful changes in attitudes.

From a theoretical perspective, attitudes are complex psychological constructs that are shaped by beliefs, values, cultural norms, and past experiences. According to health behavior theory, attitudes tend to be more stable and require longer-term interventions to change compared with knowledge (Candrawati et al., 2023). Therefore, improvements in knowledge following a single or short-term educational intervention do not necessarily translate into immediate changes in attitudes or behaviors. Furthermore, behavior change theories emphasize that knowledge is only one of several determinants influencing attitudes and practices. Other factors, such as cultural beliefs, family support, economic conditions, and prior experiences with

child feeding, may also influence mothers' attitudes toward nutrition practices. Therefore, interventions aimed at improving mothers' attitudes may need to combine education with broader community-based strategies that address these contextual factors (Silva et al., 2023).

Recent studies have highlighted the important role of mothers' nutrition education in improving child health outcomes. A systematic review by Prasetyo et al. (2023) reported that mothers' nutrition education significantly improves their knowledge and contributes to better feeding practices and child nutritional status (Prasetyo, Permatasari, and Susanti, 2023). Similarly, research across several developing countries found that mothers' nutritional literacy was strongly associated with appropriate feeding practices and improved child growth outcomes (Tahreem et al., 2025). These findings indicate that strengthening mothers' knowledge through educational interventions is an essential strategy for addressing child malnutrition.

Interactive educational approaches have also been shown to be more effective than traditional health education methods. A study on complementary feeding interventions demonstrated that participatory education methods, including demonstrations and practical learning sessions, significantly improved mothers' understanding of feeding practices (Ikhsyana, Dwiriani, and Kustiyah, 2025). In addition, the Emotional Demonstration (Emodemo) approach has been widely used in community nutrition programs because it combines emotional engagement, visual learning, and participatory interaction, thereby enhancing comprehension and knowledge retention among mothers. Research evaluating Emodemo interventions also found improvements in mothers' knowledge, attitudes, and child feeding practices following the intervention (Mukaromah et al., 2025).

CONCLUSION

Interactive educational strategies, such as Emodemo, can be an effective way to increase mothers' knowledge in community nutrition programs. Nevertheless, changes in mothers' attitudes may require longer intervention periods, repeated educational exposure, and continuous behavioral support. Future research should conduct follow-up measurements several weeks or months later to assess retention and behavioral changes over time. In addition, future nutrition education programs should integrate interactive learning methods with sustained behavior change strategies to achieve comprehensive improvements in mothers' knowledge, attitudes, and child feeding practices.

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