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Optimization of mother's understanding of the "isi piringku" complementary feeding program through audiovisual media as an effort to prevent stunting

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Abstract

Background: Stunting remains a major maternal and child health concern globally, with long-term consequences on physical growth, cognitive development, and future productivity. In 2020, an estimated 149 million children under five years of age were affected by stunting worldwide. In Indonesia, the prevalence of stunting reached 24.4% in 2021, indicating a persistent public health challenge. Inadequate maternal knowledge and inappropriate complementary feeding practices, particularly related to animal-source protein intake, contribute significantly to stunting during the critical first 1,000 days of life. Innovative nutrition education strategies are therefore needed to improve maternal knowledge and attitudes toward optimal infant and young child feeding.

Purpose: to evaluate the effectiveness of audiovisual media in improving mothers' knowledge and attitudes regarding "Isi Piringku" complementary feeding practices, with a focus on animal-source protein intake, as an effort to prevent stunting.

Method: A pre-experimental study with a one-group pretest–posttest design was conducted among mothers of children aged 6–24 months in the working area of Ikur Koto Primary Health Center, Padang, Indonesia. Participants were selected using incidental sampling. Nutrition education was delivered using audiovisual media. Data were analyzed using the Shapiro–Wilk test for normality and a one-sample t-test with a significance level of $p < 0.05$.

Results: The results demonstrated a statistically significant improvement in mothers' knowledge and attitudes after the audiovisual-based nutrition education intervention. Mothers showed better understanding of balanced complementary feeding practices, particularly the importance of animal-source protein in preventing stunting.

Conclusion: Audiovisual-based nutrition education is an effective strategy to enhance maternal knowledge and attitudes regarding complementary feeding practices. This approach has strong potential to support stunting prevention programs within maternal and child health services.

Keywords: Audiovisual Media; Complementary Feeding; Maternal Knowledge; Stunting.

INTRODUCTION

Toddlerhood is a critical period in the human life cycle, often referred to as the *golden age*, because during this phase physical, cognitive, and psychosocial growth and development occur rapidly and are largely irreversible. Children aged 0–59 months require optimal nutritional intake to ensure maximum growth and development. Inadequate nutrition during this period can lead to various health problems, one of which is stunting (World Health Organization, 2021). Stunting is a condition in which

children fail to grow or grow late due to chronic malnutrition that begins in the mother's womb during the first 1000 days of life until the age of 23 months (Dende, Kalsum, & Gandini, 2023).

Stunting is defined as a condition of growth failure in children, characterized by a length or height-for-age below minus two standard deviations from the median of the World Health Organization (WHO) child growth standards. This condition represents the manifestation of chronic malnutrition occurring from

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the prenatal period through the first two years of life, commonly referred to as the first 1,000 days of life. During this critical window, the quality of nutritional intake plays a decisive role in determining a child's future growth status (World Health Organization, 2023).

Toddlers aged 24-59 months are experiencing a very rapid growth process; however, they are also prone to have nutritional problems, including stunting. Stunting occurs mainly within the first 2 to 5 years of life. The main cause is a lack of knowledge on toddler's nutritional intake among women of childbearing age (Nuraini, Sari, Astuti, Gumilang, & Didah, 2021).

In Indonesia, data from the Indonesian Nutrition Status Survey indicated that the prevalence of stunting in 2021 remained high at 24.4%. This figure reflects that stunting continues to pose a serious challenge to national health development. Through the National Medium-Term Development Plan 2020–2024, the Indonesian government has set a target to reduce the prevalence of stunting to 11.8% by 2024, highlighting the need for more comprehensive and sustainable intervention (Ministry of Health of the Republic of Indonesia, 2023).

Various factors contribute to the occurrence of stunting, including low socioeconomic status, food insecurity, poor maternal nutritional status during pregnancy, low birth weight, suboptimal caregiving practices, inadequate sanitation and environmental hygiene, and limited access to clean water. The government has implemented several stunting prevention programs, such as the promotion of exclusive breastfeeding, macro- and micronutrient supplementation, and food assistance programs. However, these efforts have not yet resulted in a substantial reduction in stunting prevalence. Stunting not only affects children's physical growth but also has long-term consequences for cognitive development, immune function, and productivity in adulthood (Ministry of Health of the Republic of Indonesia, 2021).

Children who experience stunting are at a higher risk of developing non-communicable diseases later in life, including diabetes, hypertension, cardiovascular disease, and kidney disorders. Inadequate nutritional fulfillment during the first 1,000

days of life is often caused by limited parental knowledge and awareness, particularly among mothers, regarding appropriate nutritional intake. Exclusive breastfeeding during the first six months of life is the primary foundation for infant nutrition. However, after six months of age, the provision of high-quality complementary feeding (*complementary foods for breastfed infants* – CFBI/MP-ASI) becomes essential to meet energy and both macro- and micronutrient requirements (Ministry of Health of the Republic of Indonesia, 2023).

Protein, particularly from animal-source foods, plays a crucial role in supporting linear growth in children due to its high content of iron, vitamin B12, zinc, choline, and essential amino acids. Although plant-based proteins also contain nutrients, their content and bioavailability are relatively lower compared to animal-source proteins. Therefore, maternal understanding of the importance of animal-source protein in complementary feeding is a key factor in stunting prevention.

Stunting prevention efforts are carried out through both nutrition-specific and nutrition-sensitive interventions. One effective form of nutrition-sensitive intervention is nutrition education. In the context of rapid information technology development, audiovisual media have emerged as a promising alternative for delivering health education. Audiovisual media offer advantages in conveying messages through both visual and auditory channels, making information more engaging, easier to understand, and suitable for repeated learning (Fadylah & Prasetyo, 2021).

Stunting is a global health challenge that significantly impacts children's physical growth and cognitive development. In prevention efforts, video education is recognized as a potential means of conveying information about stunting (Dermawan & Rahfiludin, 2024). Stunting is a condition of failure to achieve normal growth caused by prolonged malnutrition. Prevention and management of stunting can be achieved by increasing the knowledge of mothers of stunted children to prevent the condition from being passed on to their next child. Education for mothers can be provided using brainstorming and audiovisual methods (Wahyurin, Aqmarina, Rahmah, Hasanah, & Silaen, 2019).

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RESEARCH METHOD

This study was conducted through several stages. Initially, a preliminary assessment was carried out to identify stunting-related problems and mothers' baseline understanding of complementary feeding based on the Isi Piringku concept. Research instruments, including a questionnaire to assess mothers' understanding and an audiovisual educational media on Isi Piringku complementary feeding, were then developed. The instruments were tested for validity and reliability prior to data collection.

The study participants were mothers with children aged 6–24 months who met the inclusion criteria. Participants were assigned to an intervention group and a control group without randomization. Before the intervention, both groups completed a pretest to assess baseline knowledge regarding complementary feeding and stunting prevention using the same questionnaire.

The intervention group received health education through audiovisual media focusing on Isi Piringku complementary feeding, covering balanced nutrition principles, types and portions of food, and appropriate feeding frequency for stunting prevention. The control group did not receive audiovisual education and continued to receive routine health education services provided by local health workers.

After the intervention, both groups completed a posttest to evaluate changes in mothers' understanding. Pretest and posttest data were analyzed to determine differences in knowledge levels before and after the intervention within each group, as well as differences between the intervention and control groups. The results were used to draw conclusions regarding the effect of audiovisual-based education on improving mothers' understanding of stunting prevention.

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RESEARCH RESULTS**Table 1. Frequency Distribution of Respondents (N=30)**

Variable	Results
Age (Mean±SD)(Range)(Year)	(30.67±6.315)(17-45)
17-25	4/13.3
26-35	21/70.0
>35	5/16.7
Education (n/%)	
Elementary School	5/16.7
Junior High School	8/26.7
Senior High School	15/50.0
Bachelor's Degree	2/6.6
Occupation (n/%)	
Housewife	16/53.3
Self-Employed	14/46.7
Knowledge Pre-Test (n/%)	
Good	3/10.0
Moderate	6/20.0
Poor	21/70.0
Knowledge Post-Test (n/%)	
Good	26/86.7
Moderate	3/10.0
Poor	1/3.3

Table 1 shows that the average age of respondents and standard deviation is (30.67±6.315) with an age range of (17-45). The majority of respondents have SHS education, namely 15 (50.0%), with the majority of respondents as housewives, 16 (53.3%). Based on the knowledge of pre-test respondents, it is poor, namely 21 (70%), while the knowledge of post-test respondents is good, namely with a total of 26 (86.7%).

Table2. Impact of Audiovisual Media on Maternal Understanding of Isi Piringku Complementary Feeding

	Before-After
P-Value	0.001

The p-value obtained was 0.001, indicating that audiovisual media were effective in improving maternal understanding of Isi Piringku complementary feeding.

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DISCUSSION

The results showed that most respondents were aged 26–35 years (70%), a group classified as young adulthood. This age group is generally considered productive, has significant family responsibilities, and demonstrates relatively strong information processing abilities. Mothers in this age range tend to be more active in seeking information about child health, including feeding practices and stunting prevention.

Previous studies suggest that young adults are more responsive to health information due to their intensive caregiving roles. states that individuals in early adulthood have enhanced information-processing capacity, particularly in decision-making related to childrearing. This is highly relevant, as respondents were mothers of toddlers with intrinsic motivation to improve caregiving practices, including nutritional fulfillment (Santrock, 2015). Previous research showed an increase in knowledge between the two groups, with a p-value of 0.000. This means there is a difference in the effect of education on the knowledge of mothers with stunted children using audiovisual methods and booklets (Pratiwi, 2022).

In terms of education, most respondents (50%) had completed senior high school. While this level provides a basic foundation for understanding simple health information, it may pose challenges when processing more technical messages. Education level influences health literacy, defined as the ability to access, understand, and use health information effectively (Nutbeam, 2008). Lower health literacy may affect mothers' understanding of balanced nutrition, complementary feeding practices, and the risks of stunting.

Therefore, audiovisual-based educational interventions are particularly suitable for mothers with moderate education levels, as they help bridge literacy gaps and reduce the risk of misinterpretation of health information (Arida, Sofyan, & Fadhiela, 2015). Emphasized that higher maternal education is associated with better decision-making regarding household food consumption.

Regarding occupation, most respondents were housewives. This is relevant because housewives typically have greater involvement in child care and food preparation, from food selection and processing to meal presentation. Consequently, audiovisual

education is highly appropriate for this group, as they can directly apply the knowledge gained in daily life.

The study demonstrated a clear increase in maternal knowledge following audiovisual education. Before the intervention, most mothers had poor or moderate knowledge and lacked comprehensive understanding of the Isi Piringku complementary feeding concept, balanced nutrition composition, feeding frequency, and stunting risks. These findings align with previous research reports that mothers' knowledge about complementary feeding remains low in many regions in Indonesia, particularly in areas with low literacy rates. Audiovisual media plays a crucial role in enhancing understanding by conveying information in an engaging and accessible manner, without requiring advanced reading and writing skills. Visual elements such as images, animations, and narratives facilitate the understanding of health messages (UNICEF, 2023).

Health education aims to improve knowledge, attitudes, and health practices through structured learning processes. Audiovisual-based education supports significant knowledge improvement by providing a comprehensive learning experience. In this study, post-intervention results showed a substantial reduction in poor knowledge levels to 3.3%, indicating the effectiveness of video-based education, especially among housewives with moderate educational backgrounds (Alvianti, Dewi, & Qadrijati, 2024).

Additionally, the effectiveness of the intervention was influenced by the relevance of the material to community needs. The video content was designed to be simple, informative, and contextually appropriate, enabling respondents to not only understand theoretical concepts but also apply them in daily practice. Audiovisual education also overcomes communication barriers associated with low reading literacy, as mothers can grasp messages without relying on lengthy texts.

Based on Dual Coding Theory, the combination of visual and verbal information provides dual processing pathways, thereby enhancing knowledge retention. Supporting evidence suggests that audiovisual media improves health literacy three times more effectively than traditional lectures

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(Fadyllah & Prasetyo, 2021). Other studies also reported significant increases in maternal knowledge about stunting after locally based audiovisual interventions (Amraini, Zainal, & Darmawan, 2024).

The results indicate that audiovisual education significantly improved maternal knowledge regarding Isi Piringku complementary feeding. Prior to the intervention, most mothers lacked understanding of balanced nutrition fulfillment for toddlers, particularly appropriate portion sizes according to Isi Piringku guidelines. This lack of baseline knowledge may be attributed to limited access to information, insufficient counseling activities, and low nutrition literacy within the community.

Following the audiovisual intervention, maternal understanding improved substantially. Mothers became more knowledgeable about ideal complementary feeding components, including carbohydrates, animal-source protein, plant-based protein, vegetables, and fruits, as well as the importance of dietary diversity, food hygiene, proper cooking methods, and regular growth monitoring.

Audiovisual media were effective because they provided concrete examples of food preparation and presentation. Mothers could directly observe recommended portion sizes and feeding practices according to child age. This approach is particularly beneficial for mothers with limited literacy skills. These findings are consistent with reported that audiovisual media significantly enhanced knowledge compared to conventional lecture-based methods (Fadyllah & Prasetyo, 2021).

Other factors contributing to the success of the intervention included the use of local language, structured and concise information flow, and direct visualization of food items, utensils, and cooking steps, which minimized the risk of misinterpretation. Overall, this study demonstrates that audiovisual media are an effective educational strategy and can be integrated into stunting prevention programs at health facilities and community levels (Fadyllah & Prasetyo, 2021).

Previous research showed that nutrition education videos were more effective in increasing knowledge compared to brochures with a p-value of 0.000. Nutrition education videos were more effective in improving attitudes compared to brochures with a p-

value of 0.001. Nutrition education videos about stunting were more effective in increasing knowledge and attitudes about stunting (Burah, Reski, Wahyuningrum, & Cahyono, 2024). This is in line with previous research, which showed that bivariate analysis using the Wilcoxon Signed Ranks Test showed a significant difference in the effect of audiovisual methods on improving mothers' knowledge about stunting in Gadungan Village, Tabanan, Bali. With a p-value of 0.00 ($p < 0.05$), there was an effective increase in mothers' knowledge about stunting. This is because the message can be received quickly and easily, easily remembered, and well-received. It is more engaging and less monotonous because mothers can hear and see, resulting in increased enthusiasm for the video content. Health education using audiovisuals has a 71.4% impact on mothers' knowledge about stunting, while the remaining 28.6% is influenced by other factors not studied (Dewi, Herliawati, Ariyanti, & Batiari, 2024).

CONCLUSIONS

Most respondents were of productive age (26–35 years), had a moderate education level (senior high school), and worked as housewives. There was a significant increase in maternal knowledge regarding complementary feeding before and after audiovisual education, influenced by the attractive and easy-to-understand media design. Audiovisual media were proven effective in improving maternal understanding of Isi Piringku complementary feeding, including food composition, menu variation, hygiene practices, and stunting prevention and audiovisual education is an appropriate medium for areas with low reading literacy and represents a promising strategy for stunting prevention programs.

SUGGESTION

For primary health centers and health workers expand the use of audiovisual media in nutrition education, particularly at posyandu and mother–toddler classes. Develop educational videos using local languages to enhance community acceptance. For mothers and families mothers are encouraged to continuously improve their knowledge of complementary feeding and apply it consistently.

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Families, particularly husbands, should support mothers in providing nutritious food and practicing clean and healthy living behaviors (phbs). Integrate audiovisual education into stunting prevention programs. Provide facilities for video screenings at posyandu, villages, and community centers and for future researchers examine long-term behavioral changes following audiovisual education develop interactive audiovisual interventions based on mobile applications or other digital media.

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