



THE EFFECTIVENESS OF BOOKLET MEDIA TO IMPROVE MOTHERS' KNOWLEDGE AND ATTITUDES TOWARD STUNTING PREVENTION IN LEUWIGAJAH PUBLIC HEALTH CENTER, CIMAHI

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Abstract

Stunting remains a major public health issue caused by chronic malnutrition, often influenced by mothers' inadequate knowledge and attitudes regarding child care and nutrition. This study aimed to determine the effectiveness of booklet-based health education in improving mothers' knowledge and attitudes toward stunting prevention. This research employed a pre-experimental design with a one-group pretest-posttest approach, conducted between May 15 and June 1, 2023. The population consisted of 506 mothers with children under five years in RW 09, and a total of 83 respondents were selected through purposive sampling. The results showed an average increase of 1.59 in knowledge scores and 6.9 in attitude scores after the intervention. Marginal Homogeneity and McNemar tests revealed a significant difference before and after the intervention (p -value = 0.000). This study confirms that booklet media is effective in enhancing mothers' knowledge and attitudes regarding stunting prevention and is recommended for broader use in health education programs.

What is already known

Previous studies have confirmed that stunting in early childhood is closely related to poor maternal knowledge and negative attitudes regarding child nutrition and health. Educational interventions—particularly those using visual or printed materials—have been shown to improve health-related behaviors and maternal decisions.

What this paper adds

This study demonstrates that health education using a booklet is significantly effective in increasing maternal knowledge and attitudes toward stunting prevention. The findings contribute empirical evidence to support the use of low-cost, accessible educational media in improving maternal behavior in public health settings.

1. Background

Stunting is a condition of impaired growth and development in children, characterized by height that is not proportional to age due to long-term inadequate nutritional intake. It reflects chronic undernutrition during the early stages of life, especially the first 1000 days, and is defined by a height-for-age z-score below -2 SD based on WHO Growth Standards [1].

Stunting remains a global nutritional challenge. The World Health Assembly through the Sustainable Development Goals (SDGs) has targeted a 40% reduction in stunting by 2025 [2]. According to WHO (2021), 149.2 million children under five are stunted globally, with Indonesia ranking second highest in Southeast Asia and fifth in the world [3]. The national prevalence decreased from 30.8% in 2018 to 21.6% in 2022 according to Riskedas and SSGI data [4].

West Java's SSGI survey (2021) reported a stunting prevalence of 24.4%, with Cimahi City at 11.05% [5]. In Cimahi, the prevalence increased from 9.06% in 2019 to 11.05% in 2021 [6]. The Leuwigajah area of South Cimahi reported the highest rate, particularly in RW 09, where 87 children were identified as stunted across four Posyandu, making it a critical zone for intervention.

Stunting leads to significant short- and long-term consequences, such as impaired brain development, cognitive delays, poor immunity, and chronic health risks [8]. Key risk factors include prolonged undernutrition, recurrent infections, and poor psychosocial stimulation [7]. Inadequate maternal knowledge, especially regarding feeding practices and nutritional needs, exacerbates the risk of stunting [9][10].

Preliminary research conducted on February 7, 2023, in RW 09 Leuwigajah revealed that many mothers lacked proper understanding of stunting, with misconceptions such as viewing it as hereditary. Furthermore, attendance at Posyandu services was low, as some mothers believed that completing immunizations at clinics negated the need for growth monitoring [6].

Health education is crucial to improving maternal knowledge and attitudes. According to Notoatmojo (2018), knowledge forms the basis of behavior, and educational efforts can shift attitudes toward healthier child-rearing practices [19]. Based on Pender's Health Promotion Model, education enhances wellness by promoting positive behavioral change [35][36]. Booklets are an effective health education medium due to their accessibility, flexibility, and clarity, as evidenced by prior research demonstrating their impact on maternal knowledge regarding stunting [31][32].

1.1 Fundamental Phenomena

Stunting remains a critical public health issue in Indonesia, with long-term implications for child growth and development. One of the contributing factors is the lack of maternal knowledge and awareness of appropriate nutrition and preventive health practices. Without targeted education, many mothers fail to recognize stunting risk factors or take preventive actions.

1.2 Review of Previous Research

Previous studies such as Harleni et al. (2022) and Suryagustina et al. (2018) demonstrated that structured health education significantly improved maternal knowledge and attitudes. Similarly, Pratiwi et al. (2022) showed the effectiveness of audiovisual and booklet-based education. These findings highlight that media-based interventions can facilitate better health outcomes for children through maternal behavior change.

1.3 Originality

This study adds originality by focusing on a specific community (RW 09, Leuwigajah) and using a structured booklet as a singular medium of education. Unlike other studies that compared multiple media formats, this research isolates the booklet's impact and statistically measures both knowledge and attitude improvements using McNemar and Marginal Homogeneity tests.

1.4 Research Urgency

Improving maternal knowledge and attitudes is urgent to reduce stunting prevalence in Indonesia. Many mothers still lack access to reliable health education, and Posyandu participation remains low. This study provides a practical, scalable educational strategy that health workers can implement in community health settings to support national stunting prevention goals.

1.5 Research Objectives

This research aims to determine the effect of health education using a booklet on improving the knowledge and attitudes of mothers regarding stunting prevention in the working area of Leuwigajah Public Health Center.

2. Literature Review

Knowledge is influenced by internal and external factors such as education, experience, and environment (Notoatmodjo, 2019). Attitude formation is a response to stimuli and is shaped by personal experience, media exposure, and emotional factors. Nola J. Pender's Health Promotion Model supports the idea that individual behavior can be changed through educational interventions that improve knowledge and motivation for preventive action (Pender, 2015).

3. Methods

This study employed a pre-experimental design with a one-group pretest-posttest approach, which observes participants before and after a single intervention without a control group. The intervention used was health education delivered through a booklet based on the Health Promotion Model (HPM). The pretest measured maternal knowledge and attitudes toward stunting prevention before the education session, and the posttest measured them afterward using the same questionnaire.

The study was conducted in RW 09, South Cimahi, under the jurisdiction of Puskesmas Leuwigajah between January and June 2023. Ethical clearance was obtained from the Health Research Ethics Commission of STIKes Budi Luhur Cimahi (No. 97/D/KEPK-STIKes/V/2023). Respondents provided informed consent, were assured of data confidentiality, and were treated equally without discrimination. Researchers ensured that participation did not disrupt respondents' routines and upheld principles of respect, benefit, and justice throughout the study.

3.1 Research Participants

The study population comprised all mothers with children aged 0–5 years in the working area of Puskesmas Leuwigajah, totaling 506 individuals. The sample size was determined using Slovin's formula with a 1% margin of error, resulting in 83 respondents. The sampling technique used was stratified proportional random sampling to ensure fair representation across the four Posyandu groups in RW 09. The inclusion

criteria were mothers who could read and write, had children aged 0–5 years, and consented to participate. Exclusion criteria included refusal to participate or having children with severe congenital diseases

3.2 Research Procedure

The study was conducted using a pre-experimental one-group pretest-posttest design. The research began with obtaining ethical approval and permission from the relevant health authorities and community leaders. Following this, informed consent was collected from all participants who met the inclusion criteria.

The procedure began with the distribution of a pretest questionnaire to assess the initial level of maternal knowledge and attitudes regarding stunting prevention. This was followed by the delivery of an educational session using a printed booklet titled "Pencegahan Stunting Sejak Dini", which contained information about the causes, impacts, and prevention strategies for stunting. The education was carried out in small group sessions facilitated by the researcher.

After a seven-day interval, participants were asked to complete the posttest questionnaire, which was identical to the pretest. This allowed the researcher to measure any changes in knowledge and attitudes following the intervention. All responses were recorded and tabulated for statistical analysis using SPSS. The entire research procedure took place from May 15 to June 1, 2023.

3.3 Instrument

The variables in this study included one independent variable—health education using a booklet—and two dependent variables: mothers' knowledge and attitudes regarding stunting prevention. Knowledge was assessed based on five indicators: definition, causes, signs, impact, and management of stunting. Attitude was measured through Likert-scale items assessing mothers' responses to nutrition-related aspects of stunting. Both instruments were developed with validated indicators and used ordinal measurement scales.

The data collection instruments consisted of three tools: a demographic questionnaire, a 20-item multiple-choice knowledge questionnaire, and an 18-item attitude questionnaire using a Likert scale. A booklet containing educational material on stunting prevention was used for the intervention. Validity testing was conducted on 20 respondents from a comparable population, and all knowledge items and 18 attitude items were found to be valid. Reliability testing using Cronbach's Alpha yielded values of 0.939 (knowledge) and 0.966 (attitude), confirming both instruments as reliable.

3.4 Data Analysis

Data collection was carried out in stages, beginning with administrative approval and coordination with community health services. Participants completed the pretest during Posyandu sessions, followed by the booklet-based education session, and later completed the posttest either in person or online via Google Forms. Data processing included editing, coding, data entry, and tabulation, followed by univariate and bivariate analyses using SPSS. The Marginal Homogeneity test was used for knowledge data, and the McNemar test for attitude changes, with significance set at $p \leq 0.05$.

4. Results

Table 4.1. Frequency Distribution of Knowledge Before and After Booklet-Based Education on Stunting Prevention

Knowledge	Before		After	
	F	(%)	F	(%)
Good	0	0%	69	83.1%
Moderate	20	24.1%	14	16.9%
Poor	63	75.9%	0	0%
Total	83	100%	83	100%

The analysis of mothers' attitudes also revealed notable improvement. Prior to the intervention, 51.8% of the respondents had negative attitudes and 48.2% had positive attitudes regarding stunting prevention. After the education was given using the booklet, 98.8% of respondents had positive attitudes while only 1.2% remained with negative attitudes.

Table 4.2. Frequency Distribution of Mothers' Attitudes Before and After Booklet-Based Education on Stunting Prevention

Attitude	Before		After	
	F	(%)	F	(%)
Positive	40	48.2%	82	98.8%
Negative	43	51.8%	1	1.2%
Total	83	100%	83	100%

Bivariate analysis further confirmed a significant effect of the educational intervention. The mean score of knowledge increased from 1.24 before the intervention to 2.83 after, with a delta of 1.59 and a p-value of 0.000. Likewise, the mean score of attitude increased from 50.39 to 57.29, with a delta of 6.9 and the same level of statistical significance ($p = 0.000$).

Table 4.3. Mean Comparison of Knowledge and Attitude Before and After Booklet-Based Education on Stunting Prevention

Variable		Mean	Delta	p-value
Knowledge	Pre	1.24	1.59	0.0001
	Post	2.83		
Attitude	Pre	50.39	6.90	0.0001
	Post	57.29		

The Marginal Homogeneity Test further supported these findings. Prior to the intervention, 63 respondents had poor knowledge and 20 had moderate knowledge. After the intervention, 69 respondents had good knowledge, 14 had moderate, and none were categorized as poor. The p-value obtained was 0.000, which is less than $\alpha = 0.05$, indicating a statistically significant effect of the education on knowledge improvement.

Table 4.4. Marginal Homogeneity Test Results

Pre-test	Post-test			Total	p-value
	Poor	Moderate	Good		
Poor	0	11	52	63	0.0001
Moderate	0	13	7	20	
Good	0	0	0	0	
Total	0	14	69	83	

In terms of attitude change, the McNemar Test showed that out of 43 respondents with a negative attitude before the intervention, 42 shifted to positive after the education. The p-value was 0.0001, indicating that the education using the booklet significantly influenced the change in mothers' attitudes toward stunting prevention.

Table 4.5. McNemar Test Results

Pre-test	Post-test		Total	p-value
	Negative	Positive		
Negative	1	42	43	0.000
Positive	0	40	40	
Total	1	82	83	

5. Discussion

A. Knowledge Before and After the Booklet-Based Education

The study conducted from May 15 to June 1, 2023, involving 83 respondents in RW 09, Leuwigajah, found that prior to the intervention, most mothers (75.9%) had poor knowledge about stunting prevention, while 24.1% had moderate knowledge. After receiving booklet-based education, 83.1% had good knowledge and 16.9% had moderate knowledge, with none categorized as poor (Research Data, 2023). This significant shift indicates a strong positive effect of the educational intervention.

Knowledge is defined as the result of remembering information gained through either intentional or unintentional experiences, often arising from contact or observation of a particular object (Notoatmodjo, 2019) [19]. Knowledge plays a vital role in shaping one's attitude and decision-making, especially in parenting. Increases in knowledge—supported by educational efforts—empower mothers to make informed choices regarding child nutrition and health to prevent stunting.

Before receiving the education, the majority of respondents could not correctly answer the pretest questions, indicating their lack of understanding of stunting prevention. However, after the intervention, most were able to respond accurately, suggesting that the booklet was a clear and accessible source of information. While a few respondents still demonstrated moderate knowledge, overall comprehension significantly improved (Research Data, 2023).

According to the Indonesian Ministry of Health, knowledge is influenced by age, occupation, education, environment, and sociocultural context (Depkes RI, 2020) [19]. Although education level is not the sole

determinant, higher education often correlates with greater knowledge. In this study, most respondents were high school graduates, aligning with Indonesia's 12-year compulsory education policy, which likely contributed to their ability to understand the material.

Demographically, most respondents were aged 20–30 years (45.8%), had completed high school (61.4%), were housewives (96.4%), and their children were predominantly firstborns aged one year (43.4%). These characteristics support their cognitive capacity to absorb and interpret the educational material effectively (Research Data, 2023).

This finding is consistent with Harleni et al. (2022), whose study on the effect of health education using brainstorming, booklets, and leaflets showed significant improvement in maternal knowledge and attitude regarding stunting. Mothers aged 20–35 benefited the most, and the booklet method proved more effective in enhancing awareness and behavioral change [Harleni et al., 2022].

B. Attitude Before and After the Booklet-Based Education

Before the intervention, 51.8% of mothers had negative attitudes toward stunting prevention, while 48.2% had positive attitudes. After the booklet-based education, 98.8% demonstrated positive attitudes, and only 1.2% remained negative (Research Data, 2023). This highlights the effectiveness of the educational material in promoting attitudinal change.

Attitude is a reaction that arises only when individuals are exposed to a stimulus. Several factors influence attitude formation, including knowledge, influence of others, personal experiences, culture, media exposure, and emotional factors (Notoatmodjo, 2019) [23]. Booklet-based education provided additional information and reinforced respondents' confidence in taking better care of their children's health, as reflected in the post-test scores. The single respondent who maintained a negative attitude may not have paid sufficient attention during the session.

Personal experience also significantly shapes attitudes and one's interpretation of social stimuli. In this context, prevailing negative community behaviors, such as poor Posyandu attendance and lack of exposure to stunting-related health programs, may have influenced prior attitudes. This highlights the importance of sustained and consistent education efforts at the community level.

According to Notoatmodjo (2019), attitudes involve the dimensions of receiving, responding, valuing, and responsibility, all of which can be developed through appropriate health education. After receiving the booklet, respondents were able to engage with the questionnaire more effectively, demonstrating a shift toward positive actions. This supports the theory that attitudes can change when individuals are provided with relevant and persuasive information (Notoatmodjo, 2019) [23].

Booklets are effective tools for behavior change because they are easy to read, comprehend, and revisit independently. The intervention led to more positive attitudes, likely because it matched respondents' existing knowledge and presented clear guidance for action. However, continuous education is needed to ensure long-term behavior change and understanding of stunting prevention.

This is consistent with findings by Pratiwi et al. (2022), whose study on the use of audiovisual and booklet methods showed significant improvement in maternal knowledge. Their results confirmed that both methods contributed positively, but the booklet's accessibility made it particularly effective in supporting stunting-related behavior change [Pratiwi et al., 2022].

C. Effect of Booklet-Based Education on Knowledge and Attitudes

Statistical tests using Marginal Homogeneity and McNemar showed p-values of 0.000 for both knowledge and attitude, which are less than the significance level of 0.05. This means there was a significant difference between the pre- and post-intervention results, confirming that education using booklets had a

positive effect on both knowledge and attitudes related to stunting prevention in Leuwigajah (Research Data, 2023).

Health education is a learning process that aims to raise individuals' awareness, knowledge, and capacity to solve health problems. The ultimate goal is to promote behavior change that supports personal and public health (Depkes RI, 2020) [28]. The improved outcomes in this study validate the impact of structured health education in increasing maternal awareness and readiness to take preventive action against stunting.

The results further support the application of Nola J. Pender's Health Promotion Model, which emphasizes the role of proactive health behaviors and education in disease prevention. Educational media like booklets help respondents learn independently and adapt positive behaviors. In this study, mothers equipped with knowledge from the booklet could take proactive steps in their children's nutrition and care (Pender, 2015) [40].

This is in line with Suryagustina et al. (2018), who found that health education on stunting prevention significantly affected mothers' knowledge and attitudes in Palangka Raya. Their results confirmed the need for structured health interventions targeting maternal behavior [Suryagustina et al., 2018].

Finally, the research suggests that education not only influences knowledge but also improves behavior, attitudes, and long-term health practices. To reduce stunting prevalence, education must aim to increase awareness, motivation, and the ability of mothers to manage nutrition effectively, making it a key strategy in public health programming.

Suggestions

Based on the findings of this study, it is recommended that health workers, especially those at community health centers and Posyandu, implement booklet-based education as a sustainable method to improve maternal knowledge and attitudes about stunting prevention. Future programs should involve periodic reinforcement and include husbands or family members to strengthen support systems for child health. Further research is encouraged to compare the effectiveness of various educational media (e.g., audiovisuals, digital apps) and to examine long-term behavioral changes following the intervention.

6. Conclusion

This study concludes that health education using a booklet significantly improves maternal knowledge and attitudes regarding stunting prevention. After the intervention, a notable increase in the number of mothers with good knowledge and positive attitudes was observed. This finding supports the integration of printed educational materials into community health promotion efforts as a cost-effective and accessible tool. Strengthening maternal awareness through such interventions has the potential to reduce the prevalence of stunting and its long-term impacts on children's health and development.

7. Limitation

This study had several limitations. First, the use of a one-group pretest-posttest design without a control group limits the ability to attribute changes solely to the booklet intervention, as other external factors may have influenced outcomes. Second, the study was conducted in a single community area, which restricts the generalizability of findings to broader populations. Lastly, data collection relied on self-reported questionnaires, which may be subject to social desirability bias or respondent misunderstanding.

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