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The effect of a nutrition education booklet for pregnant women on maternal knowledge regarding stunting prevention

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Abstract

Background: Stunting remains a major public health concern associated with chronic nutritional deficiencies, particularly during the first 1,000 days of life. Improving pregnant women's knowledge of nutrition and stunting prevention is an important component of maternal and child health promotion.
Purpose: This study aimed to assess changes in pregnant women's knowledge regarding stunting prevention following nutrition education using a booklet.
Method: This study employed a quantitative pre-experimental design with a one-group pretest–posttest approach. A total of 83 pregnant women in their first and second trimesters participated in the study in the working area of Bandung Baru Community Health Center, Pringsewu Regency, Indonesia. Data were collected using questionnaires before and after the educational intervention. Univariate analysis and the McNemar test were used, with a significance level of 0.05.
Results: Before the intervention, 48 respondents (57.8%) had good knowledge and 35 (42.2%) had poor knowledge. Following the intervention, 72 respondents (86.7%) had good knowledge and 11 (13.3%) had poor knowledge. The McNemar test indicated a statistically significant difference between pretest and posttest knowledge categories ($p = 0.001$).
Conclusion: The proportion of pregnant women with good knowledge increased following booklet-based nutrition education. The booklet may serve as a supporting educational medium for promoting knowledge of stunting prevention. The findings should be interpreted in consideration of the one-group pretest–posttest design.

Keywords: Booklet; Maternal Knowledge; Nutrition Education; Pregnant Women; Stunting Prevention.

INTRODUCTION

Stunting remains a major public health challenge in Indonesia. This condition is characterized by impaired growth in children under five and results from chronic malnutrition, particularly during the first 1.000 days of life. Pregnancy is a critical period for the future quality of human resources, as a child's growth and development are largely determined by the fetus's condition in the womb. During pregnancy, nutritional intake plays a vital role, as it directly influences the well-being of both the fetus and the mother (Nurvembrianti et al., 2021).

Data from the WHO (World Health Organization) indicate that the prevalence of stunting among children under age 5 in Indonesia based on surveys recorded in its official database was 22% in 2023, whereas the WHO's threshold for stunting is 20% (World Health Organization, 2025). According to the Ministry of Health of the Republic of Indonesia (2025), the Indonesian Nutritional Status Survey indicates that the national stunting prevalence has decreased from 21.5% in 2023 to 19.8% in 2024. Among Indonesian provinces, Highland Papua (Papua Pegunungan) has the highest stunting prevalence, at 40%. In Lampung Province, the stunting prevalence in 2024 stands at 15.9%, with Pringsewu Regency recording a high prevalence of 19.5% (Ministry of Health of the Republic of Indonesia, 2023).

If a pregnant woman lacks an understanding of nutritional requirements during pregnancy, it may lead to fetal growth issues in the womb, low birth weight

(LBW), and an increased risk of stunting during early childhood. Stunting affects not only a child's physical growth but also their cognitive development, academic performance, and even future productivity in adulthood. This situation undermines the quality of human resources in the long term. Furthermore, stunting can disrupt the programming of bodily organs, potentially leading to chronic diseases such as kidney disease, heart disease, type 2 diabetes, stroke, hypertension, and cancer (Nasriyah & Ediyono, 2023).

Previous research indicates that booklets effectively improve pregnant women's knowledge of nutrition and stunting prevention. Women's knowledge differed significantly before and after receiving health education through booklets (p-value = 0.000) and leaflets (p-value = 0.000) (Harleni et al., 2022). Another study also confirms that there is a difference in mothers' knowledge regarding stunting following the provision of education using audiovisual media (p-value = 0.000) and booklets (p-value = 0.000) (Pratiwi & Pratiwi, 2022).

RESEARCH METHOD

This study employed a quantitative approach using a pre-experimental design with a one-group pretest–posttest method. It was conducted in the working area of Bandung Baru Community Health Center, Adiluwih District, Pringsewu Regency, Indonesia, from January to June 2026.

The study involved 83 pregnant women in their first or second trimester. Respondent characteristics included age, educational level, and parity. Participants were recruited in the working area of Bandung Baru Community Health Center. The available manuscript did not specify the sampling technique or detailed inclusion and exclusion criteria; these details are therefore not added.

The independent variable was nutrition education delivered using a booklet, and the dependent variable was pregnant women's knowledge regarding nutrition and stunting prevention. Knowledge was assessed before and after the educational intervention. No additional session schedule or duration is assumed because these details were not stated in the manuscript.

Data were collected using a questionnaire to assess pregnant women's knowledge regarding nutrition and stunting prevention. The available manuscript did not report the number of questionnaire items, scoring procedure, validity and reliability results, or the cut-off used to classify knowledge as good or poor. No unreported instrument characteristics have been added.

Univariate analysis was used to describe respondent characteristics and knowledge categories before and after the intervention. The McNemar test was used to compare paired categorical knowledge data, with a significance level of $\alpha = 0.05$. The study manuscript reported $p = 0.001$; this reported value is retained. The study received ethical approval from the Health Research Ethics Committee under approval number 047/KEPK-TJK/I/2026.

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RESEARCH RESULTS

Table 1. Characteristics of Respondent (N=83)

Variable	Results	p-value
Age (Mean±SD) (Years) (Range)	(30.00 ± 5.77) (20-35)	
Healthy reproductive age (20–35 years)	68/81.9	
Outside healthy reproductive age ((<20 dan >35)	15/18.1	
Education (n/%)		
Elementary and Junior High School	27/32.5	
Senior High School and Bachelor's Degree	56/67.5	
Parity (n/%)		
Primigravida	12/14.5	
Multigravida	71/85.5	
Knowledge Before Intervention (n/%)		0.001
Poor	35/42.2	
Good	48/57.8	
Mothers' Knowledge Intervention (n/%)		0.001
Poor	11/13.3	
Good	72/86.7	

Based on the table, a total of 83 respondents participated in this study. The respondents had a mean age of 30.00 ± 5.77 years, with an age range of 20–35 years. Most respondents were categorized as having a healthy reproductive age (20–35 years), totaling 68 respondents (81.9%), while 15 respondents (18.1%) were categorized as having an unhealthy reproductive age. Regarding education, the majority of respondents had a high educational level (senior high school and bachelor's degree), accounting for 56 respondents (67.5%), while 27 respondents (32.5%) had a low educational level (elementary and junior high school). In terms of parity, most respondents were multigravida, totaling 71 respondents (85.5%), while 12 respondents (14.5%) were primigravida. Regarding mothers' knowledge before the intervention, 48 respondents (57.8%) had good knowledge, while 35 respondents (42.2%) had poor knowledge. The statistical test showed a p-value of 0.001. After the intervention, the number of respondents with good knowledge increased to 72 (86.7%), while those with poor knowledge decreased to 11 (13.3%). The statistical test also showed a p-value of 0.001, indicating a statistically significant difference in mothers' knowledge after the intervention.

DISCUSSION

The research data indicate that most respondents fall within the healthy or productive age range of 20–35 years, accounting for 68 individuals (81.9%). This suggests that most of the pregnant women in this study belong to an age group that is biologically and psychologically mature. This maturity influences an individual's capacity to receive, comprehend, and process information including health related information on nutrition and stunting prevention. Conversely, younger pregnant women (under 20 years of age) tend to possess lower levels of knowledge, and limited financial resources may further hinder their ability to meet their nutritional needs (Dumilah, 2019).

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These findings align with other research, which showed that 14 out of 16 respondents (81.3%) were between 20 and 35 years old. This suggests that as age increases, maturity and logical reasoning also increase, enabling individuals to better understand health information and apply it in daily life. Consequently, the predominance of respondents aged 20–35 in this study may contribute to the success of the health education interventions provided. The study also reveals that most respondents 56 individuals (67.5%) have a higher level of education (Harleni et al., 2022).

This indicates that most pregnant women in the working area of the Bandung Baru Community Health Center are high school/vocational school graduates or have higher education. A higher level of education equips individuals to raise their children better through effective parenting practices and to absorb new information or knowledge more readily. This is also crucial for ensuring the provision of a balanced, nutritious diet, which supports a child's growth and development (Marbun, 2019).

Additionally, the results show that 71 respondents (85.5%) are multigravida meaning they are pregnant with their second, third, or fourth child. These findings are supported another research which indicates that being a multigravida (having been pregnant more than once) is a dominant factor in stunting prevention, with an odds ratio (OR) of 1.28 compared to being a primigravida (experiencing a first pregnancy) (Sari et al., 2025). Previous pregnancy experience influences nutritional practices and parenting approaches that promote child health. Thus, multigravida mothers tend to be better equipped to prevent stunting than primigravida mothers, as they benefit from the experience, knowledge, and skills gained during prior pregnancies and child-rearing.

The results show that, among 83 respondents, 35 (42.2%) had a low level of knowledge, while 48 (57.8%) had a good level of knowledge before receiving education on stunting prevention through a booklet. These findings indicate that, prior to the intervention, a portion of the pregnant women lacked an optimal understanding of stunting prevention. This aligns with research on the impact of health education delivered through booklets on postpartum mothers' knowledge of postpartum care; their study also found that, before the health education was provided, some respondents had suboptimal levels of knowledge (Yulyana et al., 2020).

According to knowledge results from an individual's sensory perception of an object and is influenced by factors such as education, age, experience, and access to information (Notoatmodjo, 2012). Furthermore, states that expectant mothers can prevent health issues and their impact on pregnancy if they are equipped with knowledge about health risks both before conception and during the first trimester of pregnancy (Doloksaribu & Simatupang, 2019).

Based on the researcher's analysis, respondents' low level of knowledge before the educational intervention likely reflects limited access to information on nutrition and stunting prevention, as well as differences in respondent characteristics such as educational background, age, and pregnancy experience. This condition highlights the importance of providing health education as an effort to improve pregnant women's understanding of stunting prevention from an early stage.

Based on the research findings, posttest data indicate that 11 respondents (13.3%) had a low level of knowledge, while 72 respondents (86.7%) demonstrated a good level of knowledge after receiving education on stunting prevention through a booklet. These results show that most respondents improved their understanding of the material after receiving health education through a booklet. These findings are consistent with another study which indicates that health education using a booklet is effective in increasing postpartum mothers' knowledge of postpartum care, as shown by improved knowledge scores following the intervention (Yulyana et al., 2020).

This study examined the knowledge of 83 pregnant women before and after they received a nutritional booklet on stunting prevention within the working area of the Bandung Baru Community Health Center. A bivariate analysis was conducted using the McNemar test a statistical test for comparing two paired groups with categorical data at a 5% significance level (α=0.05) and a 95% confidence interval. The McNemar test yielded a p-value of 0.001 ($p < 0.05$), indicating that providing the booklet

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significantly affected pregnant women's knowledge of stunting prevention.

The results indicate that most respondents with "good" knowledge 56 individuals (67.5%) have a higher level of formal education (senior high school/vocational school or higher education). Educational attainment is a key factor influencing one's level of knowledge; it affects a mother's ability to receive and comprehend health-related information (Susilawati et al., 2022). Respondents with a senior high school or higher education background tend to have better literacy skills, making it easier for them to understand the booklet's content on nutrition and stunting prevention. Moreover, a higher level of education often grants mothers broader access to various sources of health information. In the view of the researchers, this is the most significant factor influencing an individual's level of knowledge.

The findings of this study indicate that the majority of respondents with "good" knowledge are multigravida mothers (women who have been pregnant more than once). This aligns with research by Wardanaet al. (2021), which found differences in knowledge levels between primigravida mothers (first-time pregnant women) and multigravida mothers regarding pregnancy danger signs, with the latter demonstrating better knowledge. The researchers suggest that because multigravida mothers have more experience with pregnancy, they possess a better understanding of health-related aspects such as nutrition and stunting prevention than primigravida mothers. The results indicate that most respondents with a good level of knowledge fall within the healthy age range of 20-35 years, accounting for 68 respondents (81.9%). This suggests that most pregnant women are in a stage of adulthood characterized by cognitive and emotional maturity. This maturity enhances an individual's capacity to receive, comprehend, and interpret information specifically nutritional education for preventing stunting.

Health education encompasses all planned efforts and initiatives designed to influence others whether individuals, groups, or the broader community to adopt desired behaviors (Notoatmodjo, 2012). These findings align with another research which indicates that using booklets is more effective than using leaflets in improving mothers' knowledge and attitudes regarding stunting in toddlers (p-value = 0.009) (Harleni et al., 2022). Feeding practices for toddlers are influenced by a mother's nutritional knowledge. Efforts to address stunting can be pursued by enhancing knowledge, which in turn can improve child-feeding behaviors, starting as early as the pregnancy period (Margawati & Astuti, 2018).

Furthermore, these results are consistent with another findings, which show a difference in the impact of educational interventions using audiovisual methods versus booklets on the knowledge of mothers with stunted children (p-value < 0.05). Factors can contribute to the failure of an educational intervention, such as a booklet failing to capture attention, images that do not effectively support the theme, text colors that lack sufficient contrast, language that is difficult for the target audience to understand, or a monotonous delivery of the material (Pratiwi & Pratiwi, 2022).

This study also aligns with another findings which indicate that educational outreach on the "first 1,000 days of life" (1000 HPK) delivered through leaflets significantly influences pregnant women's knowledge of stunting prevention (p = 0.000) (Mardian, 2024). Stunting occurs due to long-term nutritional deficiency during the first 1,000 days of life. Indonesia is currently facing challenges regarding stunting. A mother's health and nutritional status before pregnancy, during pregnancy, and postpartum influence fetal growth and the risk of stunting (Pratiwi & Hamidiyanti, 2020).

Data on the impact of health education show a difference in average knowledge scores before and after counseling using a booklet. Statistical analysis in another study yielded a p-value of 0.000 (< 0.05) with a mean difference of 6.35, indicating a significant change in knowledge levels following the intervention counseling via a booklet concerning postpartum care in the working area of the Basuki Rahmad Community Health Center in Bengkulu City. Booklets are useful and serve as an effective medium for delivering health education; they are particularly effective in improving postpartum mothers' knowledge of postpartum care (Yulyana, 2020). These findings align who reported that leaflets effectively increased knowledge about stunting among pregnant women at the Pematang

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Panjang Community Health Center (p-value 0.001 < 0.05) (Munthe (2021).

According to Notoatmodjo's theory, a higher level of education enables an individual to more easily receive, comprehend, and process information. In this study, the majority of respondents who demonstrated a good level of knowledge were those with a high school or higher education background. This suggests that a higher level of education supports a mother's ability to understand information regarding nutrition and stunting prevention when presented through a booklet. Based on Notoatmodjo's theory, the more experience an individual possesses, the broader their perspective and knowledge become. Experience is a factor that can influence a person's level of knowledge. In this study, most respondents with a good level of knowledge were multigravida mothers (women who have been pregnant more than once) (Notoatmodjo, 2012).

Previous pregnancy experience allows mothers to acquire more information and learn more about pregnancy-related health; consequently, they find it easier to grasp educational material concerning nutrition and the prevention of stunting compared to primigravida mothers (women experiencing their first pregnancy).

Based on the researcher's analysis, knowledge increased because of the media. A well-designed booklet can provide clear, structured information that respondents can review repeatedly, facilitating a better understanding of nutrition and stunting prevention. A small number of respondents showed no improvement or even declined, which may be attributed to factors such as individual comprehension levels, the attention paid during the educational session, and respondents' specific characteristics (Aini & Habibi, 2021)

CONCLUSION

The proportion of pregnant women classified as having good knowledge of stunting prevention was higher after receiving nutrition education through a booklet than before the intervention. The findings suggest that a nutrition education booklet can be used as a supporting medium to improve pregnant women's knowledge. Because this study used a one-group pretest–posttest design, further studies with a comparison group and follow-up assessment are needed to determine the extent and persistence of the observed change.

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