

THE EFFECT OF HEALTH EDUCATION ON MOTHERS' KNOWLEDGE OF STUNTING PREVENTION AT BOUGENVIL INTEGRATED HEALTH POST, TEGALWARU VILLAGE, KARAWANG REGENCY, INDONESIA

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ABSTRACT

Objective: This study aimed to examine the effect of health education on mothers' knowledge regarding stunting prevention at Bougenvil Integrated Health Post, Tegalwaru Village, Karawang Regency, Indonesia.

Methods: This study employed a quasi-experimental approach with a pretest–posttest two-group design. A total of 38 mothers participated, comprising 19 mothers in the intervention group and 19 in the control group. Maternal knowledge regarding stunting prevention was assessed before and after the study period. The intervention group received health education focusing on stunting prevention. Data distribution was assessed using a normality test. Changes in knowledge scores from pretest to posttest within each group were subsequently examined using a dependent *t*-test, with statistical significance established at $p < 0.05$.

Results: In the intervention group, the mean knowledge score increased from 10.89 (SD = 2.378) at pretest to 15.42 (SD = 2.987) at posttest, representing a statistically significant improvement ($p < 0.001$). The control group also demonstrated an increase, from 11.47 (SD = 2.547) to 13.53 (SD = 2.412), with a statistically significant within-group difference ($p = 0.002$). Before health education, 13 mothers (68.4%) in the intervention group were categorized as having poor knowledge, whereas after the intervention, 11 mothers (57.9%) were categorized as having good knowledge.

Conclusion: Maternal knowledge regarding stunting prevention improved significantly following health education. The findings support the potential contribution of health education to strengthening mothers' understanding of stunting prevention. However, because the reported analysis focused on within-group changes, further between-group analysis is required to establish the comparative effect of the intervention.

Keywords: health education; maternal knowledge; mothers; stunting; stunting prevention

INTRODUCTION

Stunting remains a major nutritional concern among children worldwide.

According to the World Health Organization (WHO), approximately 150.8 million children younger than

five years, representing 22.2% of children in this age group globally, were affected by stunting. Asia accounted for approximately 55% of cases, followed by Africa at approximately 39%. Among the estimated 83.6 million children with stunting in Asia, South Asia accounted for the largest proportion at 58.7%, whereas Central Asia had the lowest proportion at 0.9%.

Indonesia has also faced a substantial burden of childhood stunting. The national prevalence was reported at 30.8% in 2019 and subsequently declined to 27.7% in 2020 and 24.4% in 2021 (Kemenkes RI, 2021). Stunting has similarly remained a concern in Karawang Regency. In 2020, 9,567 children were identified as experiencing stunting, representing an increase of 2.40% compared with the previous year. This number subsequently decreased to 7,568 children in 2021 (Dinkes Kabupaten Karawang, 2021).

Nutritional status reflects the condition of the body in relation to dietary intake and the utilization of nutrients obtained from food. Insufficient intake of essential nutrients may negatively affect nutritional status, particularly during childhood, when adequate nutrition is required to support rapid growth and development. Nutritional deficiencies can produce both immediate and long-term consequences. Acute deficiencies may manifest as physical weakness, whereas prolonged nutritional inadequacy can interfere with normal

growth. Among young children, particularly those younger than two years, chronic nutritional deficiencies may result in shorter stature compared with children of the same age (Istiany, 2018).

Stunting develops as a consequence of prolonged nutritional inadequacy and may begin during fetal development, although its physical manifestations often become more apparent during early childhood. Inadequate nutrition during this critical period can increase children's susceptibility to illness and prevent them from achieving optimal physical growth later in life (Millennium Challenge Account Indonesia, 2021).

The consequences of stunting extend beyond impaired linear growth. Children affected by stunting may experience limitations in physical, motor, and cognitive development and may have greater vulnerability to infectious diseases. These conditions can subsequently interfere with school attendance, learning capacity, and educational achievement. Over time, impaired development during childhood may also influence productivity during adulthood and contribute to broader socioeconomic consequences (Indrawati, 2019).

Stunting during early childhood can therefore affect the future quality of human resources. Its short-term consequences include growth failure, impaired cognitive and motor development, suboptimal physical development, and metabolic disturbances. In the longer term,

stunting may contribute to reduced intellectual capacity. Persistent alterations in brain structure and function may interfere with children's ability to acquire and process information during school years, potentially influencing productivity later in life (Bappenas, 2018).

The occurrence of stunting is influenced by both direct and indirect determinants. Inadequate dietary intake and infectious diseases are considered direct causes, whereas household food insecurity, inadequate access to health services, and inappropriate parenting practices may contribute indirectly to the development of stunting (Kemenkes RI, 2021).

Maternal knowledge of nutrition represents another factor that may influence children's nutritional outcomes. Mothers are closely involved in decisions regarding food selection, feeding practices, health care, and daily child care. Consequently, their understanding of nutrition and health may influence the quality of care provided to children. Although maternal knowledge is considered an indirect determinant of stunting, it can influence children's dietary intake through mothers' understanding of food, nutrition, health, and appropriate preventive practices (Fadyllah, 2021). Strategies for reducing stunting should therefore address both direct and indirect determinants. Strengthening parents' and families' understanding of nutrition and stunting prevention through health education represents

one potential approach (Kemenkes RI, 2018). Health education provides individuals and communities with relevant information that may improve their understanding of health-related issues and subsequently support healthier decision-making and behavior (Rosdiana et al., 2020).

Previous research has demonstrated the potential contribution of educational interventions to improving maternal knowledge. Suryagustina et al. (2018) reported a significant improvement in mothers' knowledge concerning stunting prevention following health education delivered using leaflet media.

Considering the continuing burden of childhood stunting and the important role of mothers in nutrition and child care, strengthening maternal knowledge is an important component of preventive efforts. This study therefore aimed to examine the effect of health education on mothers' knowledge regarding stunting prevention at Bougenvil Integrated Health Post, Tegalwaru Village, Karawang Regency, Indonesia, in 2023.

METHODS

Study Design and Setting

A quasi-experimental approach with a pretest–posttest two-group design was used in this study. The design involved an intervention group and a control group, with maternal knowledge assessed at two measurement points: before and after the study period. The intervention group received health education regarding stunting

prevention. The study was conducted at Bougenvil Integrated Health Post (Posyandu Bougenvil), Tegalwaru Village, Karawang Regency, Indonesia, in 2023.

Population and Sample

The study population consisted of 38 mothers at Bougenvil Integrated Health Post. All 38 participants were included in the study, with 19 mothers assigned to the intervention group and 19 to the control group.

The original study report does not provide detailed information regarding the sampling procedure, sample-size calculation, eligibility criteria, or participant allocation procedure. Therefore, these methodological characteristics are not specified in the present report.

Health Education Intervention

Mothers in the intervention group received health education addressing the prevention of stunting. Knowledge was assessed before the educational activity and reassessed afterward to determine whether participants demonstrated changes in their understanding of stunting prevention. The original study report does not provide sufficient information regarding the duration and frequency of the educational sessions, detailed educational content, mode of delivery, intervention provider, or educational media. Therefore, these intervention characteristics are not described beyond the information documented in the original study.

Instrument

Maternal knowledge regarding stunting prevention was assessed before and after the study period. Based on the information reported in the study, the assessment addressed several aspects of stunting, including its definition, causes, consequences, contributing factors, and preventive measures.

Knowledge outcomes were expressed as numerical scores and categorical levels. The study reported categories including poor and good knowledge. However, detailed information concerning the name of the instrument, total number of items, response format, scoring procedure, cut-off points used to establish knowledge categories, and psychometric properties was not reported in the original manuscript.

Data Collection

Data were collected at two measurement points. At baseline, mothers in both the intervention and control groups completed a pretest to assess their initial knowledge regarding stunting prevention. Following baseline assessment, health education concerning stunting prevention was provided to the intervention group. Maternal knowledge was subsequently reassessed through a posttest.

The pretest–posttest procedure enabled the researchers to identify changes in knowledge scores within each group over the study period. The original report does not specify the exact

interval between the two assessments or provide additional procedural information concerning questionnaire administration.

Data Analysis

Data analysis included assessment of data distribution followed by inferential statistical testing. A normality test was initially performed to determine whether knowledge scores satisfied the assumption of normal distribution. Because the reported p -values for the normality assessments exceeded 0.05, the data were considered normally distributed and parametric statistical analysis was applied.

A dependent t -test was used to compare pretest and posttest knowledge scores within each group. Statistical significance was established at $p < 0.05$.

RESULTS

Normality of Knowledge Scores

Normality testing was conducted before the comparison of pretest and posttest knowledge scores. The reported p -values for all measurements were greater than 0.05, indicating that the data met the assumption of normality and were considered suitable for parametric analysis.

Table 1. Normality Test of Maternal Knowledge Scores

Study Group and Measurement	p -value	Distribution
Intervention group – Pretest	0.126	Normal

Intervention group – Posttest	0.200	Normal
Control group – Pretest	0.200	Normal
Control group – Posttest	0.061	Normal

Maternal Knowledge Before Health Education

Before the educational intervention, maternal knowledge regarding stunting prevention was predominantly limited. Among mothers in the intervention group, 13 participants (68.4%) were categorized as having poor knowledge.

The baseline assessment indicated that several participants had difficulty answering questions concerning fundamental aspects of stunting, including its definition, causes, consequences, contributing factors, and preventive strategies. These findings indicate that prior to receiving health education, important gaps remained in participants' understanding of stunting prevention.

Maternal Knowledge After Health Education

Following the educational intervention, an improvement in the distribution of maternal knowledge was observed. Eleven participants (57.9%) in the intervention group were categorized as having good knowledge regarding stunting prevention.

The shift from predominantly poor knowledge before the intervention toward good knowledge afterward suggests that participants demonstrated improved

understanding after exposure to the educational intervention.

Pretest and Posttest Knowledge Scores

The mean knowledge score among mothers in the intervention group was 10.89 (SD = 2.378) at pretest. Following health education, the mean score increased to 15.42 (SD = 2.987). The dependent *t*-test demonstrated a statistically significant difference between pretest and posttest measurements ($p < 0.001$).

In the control group, the mean knowledge score increased from 11.47 (SD = 2.547) at pretest to 13.53 (SD = 2.412) at posttest. The within-group difference was also statistically significant ($p = 0.002$).

Table 2. Pretest and Posttest Maternal Knowledge Scores by Study Group

Group	Measurement	<i>n</i>	Mean	SD	<i>p</i> -value
Intervention	Pretest	19	10.89	2.378	<0.001
	Posttest	19	15.42	2.987	
Control	Pretest	19	11.47	2.547	0.002
	Posttest	19	13.53	2.412	

The intervention group demonstrated a descriptive increase of 4.53 points between pretest and posttest, whereas the control group increased by 2.06 points. However, the statistical analysis reported in the original study evaluated changes separately within each group rather than directly

comparing the magnitude of change between groups.

DISCUSSION

Maternal Knowledge Before Health Education

The findings demonstrated that before receiving health education, 13 mothers (68.4%) in the intervention group had poor knowledge regarding stunting prevention. This result indicates that a substantial proportion of participants initially had insufficient understanding of essential aspects of stunting and its prevention.

Educational background may contribute to variation in health-related knowledge. Walgito (2020) stated that education can broaden an individual's knowledge and facilitate understanding of health information. Individuals with greater educational exposure may have more opportunities to obtain, interpret, and use health-related information. Conversely, limited education may restrict access to information and affect an individual's understanding of health issues.

The baseline assessment in the present study showed that participants experienced difficulty answering questions related to the definition of stunting, its causes and consequences, contributing factors, and preventive measures. These findings suggest that mothers may require structured information covering not only the meaning of stunting but also its determinants and practical approaches to prevention.

The findings are consistent with those reported by Suryagustina et al. (2018), in which 76% of mothers demonstrated poor knowledge before receiving education regarding stunting prevention. The similarity between these findings reinforces the importance of strengthening maternal understanding as part of community-based stunting prevention.

Maternal Knowledge After Health Education

Following health education, 11 mothers (57.9%) in the intervention group were categorized as having good knowledge. This change suggests that participants acquired a better understanding of stunting prevention after exposure to health information.

Knowledge is influenced by multiple factors, including educational background, age, occupation, parity, previous experience, and exposure to information. The original study reported that most respondents were not employed. Nevertheless, employment status alone does not determine access to health information. Individuals can obtain knowledge from health professionals, family members, community activities, personal experiences, and other sources.

Access to relevant information may influence how individuals understand health problems and make decisions. In the context of stunting prevention, health professionals have an important role in communicating accurate and understandable information to mothers. Increased exposure to health

information can provide mothers with a stronger basis for recognizing nutritional problems and considering appropriate preventive actions.

Notoatmodjo (2018) emphasized that knowledge provides an important cognitive basis for decision-making and action. Behavior that is supported by adequate understanding may be more sustainable than behavior undertaken without sufficient knowledge. Therefore, improving maternal knowledge can be regarded as an important initial component of efforts to encourage appropriate stunting-prevention practices.

The findings of this study are also consistent with previous research. Widari and Salimuna (2016) reported that 55% of mothers who received health counseling concerning child nutrition demonstrated good knowledge. Suryagustina et al. (2018) similarly found that 80% of mothers achieved good knowledge following education regarding stunting prevention.

Health education involves a learning process intended to produce changes in participants' abilities and understanding. Notoatmodjo (2018) described learning outcomes as changes that emerge through an educational process. From this perspective, the improvement in knowledge identified after health education in the present study may represent an outcome of participants' exposure to and processing of the information provided during the intervention.

Effect of Health Education on Mothers' Knowledge of Stunting Prevention

The intervention group showed a marked improvement in maternal knowledge. The mean score increased from 10.89 (SD = 2.378) before health education to 15.42 (SD = 2.987) after the intervention. The dependent *t*-test demonstrated that this within-group change was statistically significant ($p < 0.001$).

The findings are consistent with those reported by Septianingsih and Pangestu (2020), who identified differences in maternal knowledge before and after stunting education delivered through video and leaflet media in the working area of Saigon Health Center, East Pontianak District. Waliulu et al. (2018) also reported that educational activities influenced knowledge and efforts related to stunting prevention.

Nevertheless, previous evidence has not been entirely consistent. Kusumawati et al. (2016) reported no significant difference in knowledge in research concerning nutritional improvement during the first 1,000 days of life through optimization of the role of nutrition professionals in Banyumas Regency. Differences between studies may reflect variation in participants, educational strategies, intervention implementation, and contextual characteristics.

According to Notoatmodjo (2018), health education can be understood as a process involving inputs and outputs.

The outcomes of education may be affected by learner characteristics as well as by educational methods, content, educators, and media used to communicate health messages. Optimal educational outcomes therefore depend on the interaction of these components.

In the present study, the improvement observed following health education indicates that providing mothers with structured information may strengthen their understanding of stunting prevention. Appropriate educational activities may help mothers recognize the determinants and consequences of stunting and understand preventive measures relevant to child nutrition and care.

An important finding requiring consideration is that knowledge also increased significantly in the control group. The mean score in this group increased from 11.47 (SD = 2.547) at pretest to 13.53 (SD = 2.412) at posttest ($p = 0.002$). Although the descriptive increase was larger in the intervention group (4.53 points) than in the control group (2.06 points), the statistical procedure reported in the study assessed pretest–posttest differences separately within each group.

Consequently, the significant within-group result in the intervention group should not, by itself, be interpreted as definitive statistical evidence that health education produced a greater improvement than occurred in the control group. A direct between-group comparison of change scores or an analysis that adjusts posttest scores for

baseline differences would provide stronger evidence regarding the specific effect attributable to the intervention.

CONCLUSION

Maternal knowledge regarding stunting prevention improved following the health education intervention. Before health education, 13 mothers (68.4%) in the intervention group were categorized as having poor knowledge. Following the intervention, 11 mothers (57.9%) demonstrated good knowledge.

The mean knowledge score in the intervention group increased from 10.89 (SD = 2.378) at pretest to 15.42 (SD = 2.987) at posttest, and this within-group improvement was statistically significant ($p < 0.001$). The control group also demonstrated a significant increase from 11.47 (SD = 2.547) to 13.53 (SD = 2.412; $p = 0.002$).

Overall, the findings demonstrate improved maternal knowledge following health education and indicate the potential value of educational interventions for strengthening mothers' understanding of stunting prevention. Nevertheless, because the statistical analysis reported in this study examined within-group changes, additional between-group analysis would be necessary to establish the comparative effectiveness of the intervention more conclusively.

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