

IMPROVING THE NUTRITIONAL KNOWLEDGE OF MOTHERS OF STUNTED TODDLERS THROUGH NUTRITION EDUCATION USING THE SIGAP MEDIA

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Abstract. Bojong village is a designated stunting hotspot within the Kotabumi Udik Community Health Centre service area, with the highest prevalence at 10.38%. A contributing factor to this nutritional issue is limited maternal knowledge and suboptimal nutritional parenting practices. This activity aimed to improve the knowledge and attitudes of mothers with stunted toddlers regarding child nutrition through an educational intervention. This community service activity was conducted at the Talang Bojong Village Hall on June 10, 2026, targeting 22 mothers of stunted toddlers. The intervention involved health education using the "SIGAP" media (Child Nutrition Intervention Menu Cycle Calendar). Evaluation was carried out using pre-test and post-test questionnaires, followed by analysis using the paired-samples t-test. Results: Following the intervention, the mothers' average knowledge score increased from 65.75 to 75.45. The average attitude score also rose from 81.72 to 84.90, with 100% of respondents demonstrating a positive shift in attitude. Statistical analysis revealed a significant difference in maternal knowledge and attitudes before and after the education session (p -value = 0.000). Nutrition education using the "SIGAP" media proved effective in enhancing theoretical knowledge and strengthening mothers' commitment and emotional attitudes toward improving toddler nutrition. Nutrition education utilising practical media should be continuously implemented by health volunteers and community health centres as a consistent promotive and preventive measure to accelerate the reduction of stunting rates at the village level.

Keywords: maternal attitude, nutritional knowledge, SIGAP media, stunting

Abstrak. Desa Talang Bojong merupakan wilayah lokus stunting dengan prevalensi tertinggi di UPTD Puskesmas Kotabumi Udik, yaitu sebesar 10,38%. Salah satu faktor pemicu masalah gizi ini adalah kurangnya pengetahuan dan pola asuh gizi ibu. Kegiatan ini bertujuan meningkatkan pengetahuan dan sikap positif ibu balita stunting mengenai gizi anak melalui intervensi edukasi. Kegiatan pengabdian masyarakat (KKN) ini dilaksanakan di Balai Desa Talang Bojong pada 10 Juni 2026 dengan sasaran 22 ibu balita stunting. Intervensi dilakukan melalui penyuluhan menggunakan media "SIGAP" (Kalender Siklus Menu Intervensi Gizi Anak). Evaluasi diukur menggunakan kuesioner pre-test dan post-test, kemudian dianalisis menggunakan uji statistik Paired Samples Test. Setelah intervensi, rata-rata skor pengetahuan ibu meningkat dari 65,75 menjadi 75,45. Skor rata-rata sikap ibu juga mengalami kenaikan dari 81,72 menjadi 84,90, dengan 100% responden yang menunjukkan respons perubahan sikap yang positif. Hasil uji statistik menunjukkan perbedaan yang signifikan pada tingkat pengetahuan dan sikap ibu sebelum dan sesudah penyuluhan (p -value = 0,000). Penyuluhan gizi dengan media "SIGAP" terbukti efektif meningkatkan pengetahuan teoretis serta memperkuat komitmen dan sikap emosional ibu dalam perbaikan gizi balita. Penyuluhan gizi berbasis media praktis perlu dilaksanakan secara berkesinambungan oleh kader kesehatan dan puskesmas sebagai langkah promotif dan preventif yang konsisten guna mempercepat penurunan angka stunting di tingkat desa.

Kata Kunci: media SIGAP, pengetahuan gizi, sikap ibu, stunting

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INTRODUCTION

Stunting is a condition of impaired growth in children caused by chronic nutritional deficiencies or malnutrition associated with inadequate nutrient intake in the past, characterized by a child's height being shorter than that of children of the same age (Ministry of Health of the Republic of Indonesia, 2025). According to the World Health Organization (WHO),



stunting is defined as a height-for-age (HAZ) Z-score below -2 standard deviations based on the WHO Child Growth Standards.

Chronic nutritional deficiencies during the first 1,000 days of life (1,000 Days of Life/HPK) are a major contributing factor to stunting, adversely affecting children's physical growth and cognitive development. This condition poses long-term risks and increases the likelihood that children will grow into adults with poorer health outcomes. In general, the high prevalence of stunting is driven by direct determinants, such as inadequate nutritional intake and exposure to infectious diseases. However, other multisectoral risk factors also contribute, including young maternal age, limited knowledge of childcare practices, such as failure to provide exclusive breastfeeding, socioeconomic factors, household crowding, and inadequate environmental sanitation facilities. These challenges are exacerbated by low levels of awareness among communities and healthcare workers, who may sometimes perceive short stature (*stunting*) as a normal physical variation (Masyeni et al., 2026). Therefore, improving mothers' capacity and knowledge is a crucial intervention to support optimal child growth and development (Kisnawaty et al., 2024).

The health impacts of stunting can be categorized into two phases: short-term and long-term effects. In the short term, stunting directly impairs brain structure development, reduces cognitive abilities, and adversely affects children's physical growth and metabolic processes. In the long term, the consequences of stunting manifest as reduced cognitive function and a weakened immune system, making individuals more susceptible to infections. Furthermore, stunting increases the risk of various chronic degenerative diseases in adulthood, such as diabetes, heart disease, and stroke (Budiarti et al., 2025).

In general, the primary causes of stunting are rooted in inadequate nutritional intake, including deficiencies in energy, protein, and micronutrients, as well as the high prevalence of infectious diseases among children. In addition to these direct factors, various contributing risk factors also play a role, including genetic factors related to parental height, a history of low birth weight (LBW), caregivers' educational levels, poor environmental sanitation, and inappropriate complementary feeding (complementary foods for breast milk/MPASI) practices. These factors interact with one another and influence the optimal growth and development of children during critical stages of life (Naulia et al., 2021).

Stunting prevention can be optimized through specific nutritional interventions targeting the critical period of the first 1,000 days of life (1,000 Days of Life/HPK). These strategies include meeting mothers' macronutrient and micronutrient requirements during pregnancy and ensuring adequate intake of both animal- and plant-based protein according to the developmental stage of children over six months of age. In addition to adequate nutrition, these efforts should be accompanied by maintaining sanitation and hygiene and ensuring access to clean water to reduce the risk of infection. Preventive measures should also be supported by regular monitoring of children's growth and development at integrated health service posts (*posyandu*) every month. Through routine weighing and height measurements, children's anthropometric status can be assessed at an early stage to detect potential stunting as early as possible (Ministry of Health of the Republic of Indonesia, 2018).

Parents, particularly mothers, play an important role in meeting children's nutritional needs because children require parental attention and support during periods of rapid growth and development (Akib, 2024). Mothers with limited nutritional knowledge may have difficulty selecting nutritious foods for their children and families, which can adversely affect their children's nutritional status (Dwi Kinasih & Afifah, 2023; Masthalina et al., 2026). Maternal knowledge also influences attitudes and practices, which in turn affect the growth and development of young children experiencing growth disorders such as stunting (Indrasari & Husna, 2023). Adequate maternal knowledge can serve as an important strategy for preventing and addressing stunting. Good maternal knowledge is needed as an initial step because mothers are typically the first individuals responsible for meeting children's nutritional needs and supporting their optimal growth and development. Children's development can be assessed through anthropometric measurements and behavioral questionnaires as part of preventive efforts (Day et al., 2025; Mitra et al., 2025). Anthropometric assessment can be used to

determine whether a child has adequate or inadequate nutritional status (Ministry of Health of the Republic of Indonesia, 2020). This assessment provides an important basis for nutritional improvement when inadequate nutritional status is identified, supported by adequate maternal knowledge (Gunardi et al., 2024).

A study by Andriyani et al. (2025) reported a significant association between maternal knowledge and efforts to reduce the risk of stunting among young children, with a p-value of 0.007. Consistent with these findings, Naulia et al. (2021) reported an association between maternal attitudes and knowledge and the incidence of stunting.

According to the 2024 Indonesian Nutritional Status Survey (SSGI), the prevalence of stunting in Lampung Province was 15.9% (Ministry of Health of the Republic of Indonesia, 2025). Within the service area of Kotabumi Udik Public Health Center, Talang Bojong Village had the highest proportion of stunted children, with a prevalence of 10.38%. Based on the background described above, the KKN team was interested in conducting a study to determine the influence of maternal knowledge and attitudes on the incidence of stunting among mothers of young children in the service area of Kotabumi Udik Public Health Center, Talang Bojong Village, Kotabumi District, North Lampung Regency.

METHOD

The nutrition education activity for mothers of stunted toddlers was conducted in Talang Bojong Village, Kotabumi District, North Lampung Regency, on Wednesday, June 10, 2026, using the "SIGAP" educational media. "SIGAP" is an acronym for *Siklus Menu Intervensi Gizi Anak untuk Penanggulangan Stunting* (Child Nutrition Intervention Menu Cycle for Stunting Prevention and Management). The media contains menu cycles and recommended portion sizes that can be used by mothers of stunted toddlers as a reference for feeding practices.

The nutrition education activity was held at the Talang Bojong Village Hall, Kotabumi District, North Lampung Regency, targeting mothers of stunted toddlers in Talang Bojong Village. A total of 22 mothers participated in the activity, and all targeted participants attended. The activity began with an introduction by the KKN team and a brief explanation of the activity, followed by the completion of a questionnaire and an introduction to the "SIGAP" media. The pre-test and post-test procedures were explained by Ria Fadilla. After completing the pre-test questionnaire, the participants received a 30-minute educational session delivered by Dewi Kurnia. The material covered stunting, including its causes, impacts, and prevention and management strategies. This was followed by an explanation of the "SIGAP" media, delivered by Wempy Andarista, as one of the interventions for stunting prevention and management. After the educational session, a question-and-answer session was conducted. The activity then continued with the completion of the post-test questionnaire and concluded with a group photograph and the distribution of snacks for the stunted toddlers.

Participant evaluation was conducted by comparing the results of the questionnaires completed before and after the nutrition education session. The questionnaire scores were analyzed to determine whether there was a change in the participants' knowledge, either an increase or a decrease. According to Arikunto (2006), as cited in Kisnawaty et al. (2024), total knowledge questionnaire scores are categorized as good when the score is $\geq 75\%$, moderate when the score ranges from 56% to 74%, and poor when the score is $< 55\%$.

RESULT AND DISCUSSION

The nutrition education activity was conducted at the Talang Bojong Village Hall, Kotabumi District, North Lampung Regency, targeting 22 mothers of stunted toddlers. The activity began with an introduction to the KKN participants and a brief explanation of the activity, followed by completion of the pre-test questionnaire and a 30-minute educational session. The session continued with a question-and-answer session and concluded with a group photograph and the distribution of snacks for the stunted toddlers.



Figure 1. Documentation of the nutrition education activity

Based on the measurement results, a positive change in the level of knowledge was observed among mothers of stunted toddlers after receiving the child nutrition education intervention. Before the education session (pre-test), the mothers' mean knowledge score was 65.75, with the lowest score reaching 46.67. This finding indicates that the mothers' initial understanding of children's nutritional needs still needed to be improved to support optimal care for their toddlers. However, after receiving nutrition education (post-test), the mothers' mean knowledge score increased substantially to 75.45.

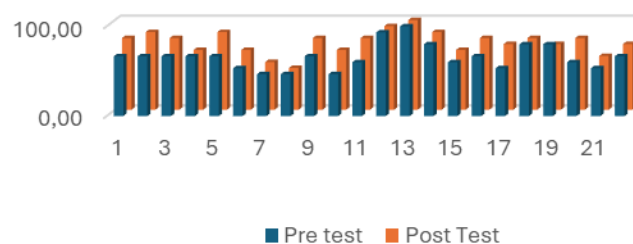


Figure 2. Graphic of evaluation results of participants' nutrition knowledge

Of the 22 respondents included in the assessment, 16 mothers experienced a notable increase in their scores, 5 mothers had unchanged scores, and only 1 mother experienced a decrease in score. These findings demonstrate that the education and information delivered through the nutrition education session were well received and effectively enhanced the mothers' knowledge and understanding.

Table 1. Nutrition knowledge scores before and after the nutrition education session

Assesment	Minimum	Maximum	Mean	P-Value
Pre Test	46,67	100,00	65,75	0,000
Post Test	46,67	100,00	75,45	

Based on the statistical analysis presented in the *Paired Samples Test* table, the *Sig. (2-tailed)* value was 0.000. Because this significance value was lower than the predetermined alpha level of 0.05, the null hypothesis (H_0) was rejected, and the alternative hypothesis (H_1) was accepted. This indicates a statistically significant difference in mothers' nutritional knowledge before and after the nutrition education intervention. Scientifically, the nutrition education intervention had a significant and effective impact on expanding the knowledge and improving the understanding of mothers of stunted toddlers in Talang Bojong Village.

These findings are consistent with Andersen's Behavioural Model of Health Services Use, particularly the Predisposing Factors component. This model explains that a mother's knowledge and attitudes constitute basic internal characteristics that strongly influence health-related behaviours, including decisions regarding children's nutritional intake. Health education serves as an external stimulus that can effectively increase an individual's level of knowledge, transforming limited understanding into greater awareness. As mothers' knowledge of the

importance of adequate nutrition for toddlers increases, it may encourage changes in attitudes and strengthen self-awareness to implement appropriate nutritional parenting practices, thereby supporting the recovery and growth of children experiencing stunting (Babitsch et al., 2012). Maternal knowledge of nutrition also plays an important role in mothers' ability to select and provide nutritious foods for their children, which ultimately affects children's nutritional status (Irawati & Ifalahma, 2024).

The increase in maternal knowledge observed in this study is consistent with the findings of Indrasari & Husna (2023), as well as Fitri Wahyuni et al. (2024) and Sukmawati et al. (2023), who reported that mothers' knowledge of stunting increased after receiving health education in the form of nutrition education. These studies demonstrate that health education can have a positive effect on maternal knowledge. Children born to mothers with lower levels of education are more likely to experience stunting, suggesting that improving maternal knowledge may contribute to better child growth. Similar findings were reported by Yuliani et al. (2023), who found that education regarding the first 1,000 days of life increased the knowledge and attitudes of pregnant women regarding stunting prevention. Improving knowledge during pregnancy is an important preventive measure because it can prepare mothers to meet their children's nutritional needs from the earliest stages of life, thereby minimizing the risk of stunting.

In addition, Sukmawati et al. (2023) found that nutrition education delivered through lectures and leaflet-based media significantly improved the knowledge of mothers of stunted toddlers. Their study emphasized that structured and repeated education can strengthen mothers' understanding of toddlers' nutritional needs, making it an effective intervention to support stunting prevention and management programs at the primary healthcare level.

Based on the findings of this study and supported by previous research, nutrition education can be considered an effective intervention for improving mothers' knowledge of stunting. Better nutritional knowledge can improve mothers' ability to make decisions regarding food selection, the preparation of balanced and nutritious menus, the provision of animal-based protein, and appropriate feeding practices. Therefore, nutrition education should be implemented continuously as part of promotive and preventive efforts to accelerate the reduction of stunting prevalence.

The nutrition education activity on child nutrition demonstrated a positive effect on improving the knowledge of mothers of stunted toddlers in the study area. The increase in the mean knowledge score from 65.75 to 75.45 confirms that direct delivery of nutritional information is an important strategic component of stunting prevention and management programs. Given the crucial role of mothers as primary decision-makers regarding food preparation and provision within the household, efforts to strengthen nutritional knowledge should be implemented consistently and continuously. This approach is expected to help translate improved knowledge into actual behavior, particularly appropriate practices for providing balanced and nutritious foods to children.

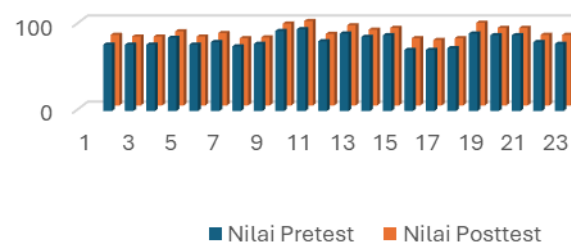


Figure 3. *Graphic of evaluation results of parents' attitudes toward child nutrition*

Based on the data analysis, a positive change in the mothers' attitudes toward meeting their children's nutritional needs was observed after the nutrition education intervention. Before the activity (pre-test), the mothers' mean attitude score was 81.73, with the lowest score being 71.00. This finding indicates that, in general, the mothers already had relatively positive and receptive attitudes toward nutritional issues among stunted children. After the nutrition education session, the mean attitude score increased to 84.91, with the highest score reaching

98.00. Furthermore, all 22 mothers assessed, or 100% of the respondents, experienced an increase in their attitude scores, with no respondents showing unchanged or decreased scores. These findings indicate that the information delivered through the nutrition education session successfully increased mothers' awareness and acceptance, strengthening their support and commitment to improving their children's nutritional status.

Table 2. *Attitude scores before and after the nutrition education session*

Assesment	Minimum	Maximum	Mean	P-Value
Pre Test	71,00	95,00	81,72	0,000
Post Test	76,00	98,00	84,90	

Based on the statistical analysis presented in the Paired Samples Test table, the Sig. (2-tailed) value was 0.000. Because this significance value was substantially lower than the predetermined alpha level of 0.05, the null hypothesis (H_0) was rejected and the alternative hypothesis (H_1) was accepted. Statistically, this indicates a significant difference between mothers' attitudes before and after the nutrition education intervention. In other words, the nutrition education activity was effective in changing and improving the positive attitudes of mothers of stunted toddlers in Talang Bojong Village toward child nutrition.



Figure 4. *Group photograph after the nutrition education activity*

The consistent improvement in attitudes is highly relevant when examined through Andersen's Behavioral Model of Health Services Use, particularly the Predisposing Factors component. In Andersen's model, attitudes and health beliefs are important internal factors that influence an individual's decision to engage in health-related actions (Babitsch et al., 2012). Attitude reflects an individual's mental readiness to act and is dynamic and responsive to external information. When mothers receive appropriate nutrition education, new information can serve as a stimulus that helps clarify previous perceptions or uncertainties. Consequently, stronger internal beliefs may develop, leading to more positive attitudes. These positive attitudes can subsequently serve as a foundation for mothers to regularly take their children to healthcare facilities and implement healthy food preparation practices at home.

These findings are also consistent with previous studies by Hapsah and Pamelasari (2025) and Khopiyani et al. (2024), which reported that improvements in maternal knowledge and attitudes can be achieved through various forms of education, including health education, training, and nutrition counseling. Increased maternal knowledge can subsequently improve feeding practices, particularly in terms of menu variety, consumption of animal-based protein, and selection of nutritious foods. Naulia et al. (2021) also reported that nutrition education can improve knowledge and attitudes regarding nutritional fulfillment, suggesting that nutrition education can serve as an alternative intervention for improving health-related behaviors to prevent stunting.

Nutrition education on child nutrition demonstrated a significant and consistent positive effect on the attitudes of mothers of stunted toddlers. The increase in the mean attitude score from 81.73 to 84.91, together with the finding that all respondents experienced an increase in their scores, indicates that education can play an important role in strengthening mothers' awareness and attitudes. This 100% positive change in attitude represents an important initial foundation because mothers with supportive attitudes may be more receptive to adopting appropriate daily practices, such as preparing balanced and nutritious meals, which may ultimately contribute to efforts to reduce stunting among their children (Saleh et al., 2021; Mulyani et al., 2025).

The findings of this study indicate that nutrition education can improve positive attitudes among mothers regarding the nutritional needs of stunted toddlers. This improvement suggests that mothers became more receptive to the importance of providing balanced and nutritious foods, ensuring adequate animal-based protein intake, and implementing appropriate feeding practices (Nastaina et al., 2025; Paro et al., 2025). Positive attitudes are an important factor that may encourage changes in mothers' daily feeding behaviors, thereby supporting stunting prevention and management efforts (Saaka et al., 2021). These findings are consistent with Dwi Kinasih & Afifah (2023), who reported that stunting education delivered through video media significantly improved mothers' knowledge and attitudes, demonstrating that education can be an effective strategy for promoting stunting-prevention behaviors. The findings are also supported by Lasmadasari et al. (2023), who explained that improvements in maternal knowledge through specific nutritional interventions can contribute to behavioral changes in meeting the nutritional needs of infants and toddlers. The better the mother's knowledge, the better the feeding practices and fulfillment of children's nutritional needs. Therefore, continuous education and assistance are important components in accelerating efforts to reduce stunting.

CONCLUSION

The provision of child nutrition education was highly effective in improving the understanding and commitment of mothers of stunted toddlers, as demonstrated by the increase in the mean knowledge score from 65.75 to 75.45 and the increase in the mean attitude score from 81.73 to 84.91. This intervention not only improved most of the mothers' theoretical understanding but also positively influenced their attitudes, with 100% of respondents experiencing an increase in their attitude scores toward improving child nutrition and feeding practices at home.

Based on the statistical analysis, both knowledge and attitude were evaluated using the Paired Samples Test, which yielded a Sig. (2-tailed) value of 0.000. Because this significance value was lower than the predetermined alpha level of 0.05, the null hypothesis (H_0) was rejected and the alternative hypothesis (H_1) was accepted, indicating a significant difference in knowledge and attitudes before and after the nutrition education intervention. Practically, media-based nutrition education should be implemented continuously by health cadres and public health centers (puskesmas) as a consistent promotive and preventive strategy to accelerate the reduction of stunting prevalence at the village level.

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