

STUNTING PREVENTION THROUGH A COMBINATION OF NUTRITION EDUCATION AND SIMULATION GAMES

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Abstract. Stunting is a chronic malnutrition problem caused by a long-term lack of nutritional intake due to food not meeting children's nutritional needs. It is important for the community, especially mothers of infants and toddlers, to have the knowledge and skills to meet children's nutritional needs to prevent stunting. The purpose of this community service activity is to empower the community to implement stunting prevention measures. The target of the activity is mothers with infants and toddlers in the Sako Community Health Centre working area. The method of implementation of the activity is community empowerment through educational activities using the SiDu Card simulation games. The results obtained before the community service activity were only 11 mothers (36.7%) who had good knowledge regarding stunting and fulfilling nutrition for children. After the education and simulation games, more than half of the mothers had good knowledge (76.7%). This community service activity was able to increase community knowledge regarding stunting and fulfilling nutritional needs for children. The necessary follow-up plan is regular monitoring and evaluation of the implementation of education carried out by the community health centre and cadres using the SiDu Card as one of the educational media related to fulfilling nutritional needs to prevent stunting in children.

Keywords: nutrition education, simulation games, stunting

Abstrak. Stunting merupakan masalah kekurangan gizi kronis yang disebabkan oleh kurangnya asupan gizi dalam jangka panjang karena makanan tidak memenuhi kebutuhan gizi anak. Masyarakat, khususnya ibu yang memiliki bayi dan balita, perlu memiliki pengetahuan dan kemampuan dalam pemenuhan nutrisi anak dalam rangka pencegahan stunting. Tujuan kegiatan pengabdian kepada masyarakat ini adalah pemberdayaan masyarakat sehingga mampu melakukan tindakan pencegahan stunting. Sasaran kegiatan adalah ibu yang memiliki bayi dan balita di wilayah kerja Puskesmas Sako. Metode pelaksanaan kegiatan adalah pemberdayaan masyarakat melalui kegiatan edukasi menggunakan permainan simulasi SiDu Card. Hasil yang didapatkan sebelum dilakukan kegiatan pengabdian kepada masyarakat hanya terdapat 11 ibu (36,7%) yang memiliki pengetahuan baik terkait stunting dan pemenuhan nutrisi bagi anak. Setelah dilakukan edukasi dan permainan simulasi, lebih dari separuh ibu memiliki pengetahuan baik (76,7%). Kegiatan pengabdian kepada masyarakat ini mampu meningkatkan pengetahuan masyarakat terkait stunting dan pemenuhan kebutuhan nutrisi bagi anak. Rencana tindak lanjut yang diperlukan adalah monitoring dan evaluasi secara berkala terhadap pelaksanaan edukasi yang dilakukan oleh pihak puskesmas dan kader menggunakan SiDu card sebagai salah satu media edukasi terkait pemenuhan kebutuhan nutrisi guna pencegahan stunting pada anak.

Kata Kunci: edukasi gizi, permainan simulasi, stunting

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INTRODUCTION

Stunting is a chronic nutritional problem caused by prolonged inadequate nutrient intake due to food consumption that does not meet children's nutritional requirements (Kemenkes RI, 2025). This condition is characterized by a child's height being below the standard for their age (Imani, 2020). Stunting can negatively affect children's growth and development, cognitive abilities, and long-term health outcomes (WHO, 2024). In addition to affecting health, stunting is also associated with poor educational attainment, reduced productivity in adulthood, lower lifetime income, and decreased chances of escaping poverty (Lestari et al., 2024). These impacts indicate that stunting not only affects childhood growth but also has long-term implications for quality of life and socio-economic status in the future.



Data indicate that stunting remains an unresolved issue both globally and in Indonesia (United Nations, 2018, as cited in Kirana et al., 2022). According to the World Health Organization (WHO) (2025) 23.2% of children under five years of age were stunted in 2024. In Indonesia, the prevalence of stunting among children under five decreased from 21.5% in 2023 to 19.8% in 2024 based on the Indonesian Nutritional Status Survey (SSGI) (Kemenkes RI, 2025). Stunting prevention requires awareness and active involvement from the community, particularly families (Kemenkes RI, 2024). Families, especially mothers, play a crucial role in preventing stunting (Has et al., 2024). Mothers are the individuals closest to children and are primarily responsible for their health and well-being (Ilma et al., 2025). The role of mothers in stunting prevention may be influenced by several factors, including knowledge (Nurbaiti et al., 2023).

Knowledge is defined as information and understanding acquired through the process of perceiving a particular object (Notoatmodjo, 2018). Adequate knowledge regarding nutrition and appropriate feeding practices can help mothers make informed decisions that contribute to stunting prevention in children (Starkweather et al., 2020). Previous studies have demonstrated a significant association between maternal knowledge and the incidence of stunting among children (Kresnawati et al., 2022; Palupi et al., 2023). This relationship indicates that knowledge is a key determinant of behaviour, influencing mothers' ability to adopt appropriate feeding practices and fulfil children's nutritional needs in order to prevent stunting. Given the important role of maternal knowledge in stunting prevention, effective strategies are needed to improve mothers' understanding of appropriate nutrition and childcare practices. One such strategy is health promotion.

Health promotion is a process of empowering communities through activities that provide information, influence attitudes, and encourage active participation in supporting behavioural and environmental changes while maintaining and improving health toward an optimal health status (Kholid, 2023). One form of health promotion is educational intervention using effective media that can enhance knowledge and encourage positive behavioural changes among the target population (Kirana et al., 2022). Therefore, selecting suitable educational media is essential to ensure that health messages are effectively understood and retained by participants.

The educational media used in this community service program were guided by Edgar Dale's Cone of Experience Theory. This theory suggests that learning experiences involving active participation and more concrete experiences lead to better understanding than learning that relies solely on verbal or passive methods (Sarkar, 2023). Consequently, educational approaches that actively engage participants are believed to enhance both comprehension and information retention. One educational method that aligns with this theoretical framework is the use of simulation games.

Simulation games represent an interactive learning approach that enables participants to engage directly in the educational process (Wahyuni et al., 2024). Through simulation activities, participants do not merely receive information; they actively interact with the learning materials, making the educational experience more engaging, meaningful, and memorable (Febriyani et al., 2023; Hasbi et al., 2024). Furthermore, a study conducted by Muharyani et al. (2025) demonstrated that simulation games significantly improved mothers' knowledge levels.

Sako Public Health Centre, as a partner in this community service program, demonstrated strong support and commitment to stunting prevention efforts. In addition, mothers with infants and young children in the Sako Public Health Centre service area showed a high level of interest in child health issues, indicating a strong potential to receive and apply health education. Based on these conditions, this community service program was implemented through a combination of nutrition education and a simulation game using the SiDu Card, an educational medium developed by the community service team and officially registered under Intellectual Property Rights (IPR). Therefore, this community service program aimed to improve mothers' knowledge regarding stunting prevention through nutrition education combined with a SiDu Card-based simulation game.

METHODS

The implementation methods of this community service program consisted of community empowerment, health education, and simulation games. The target participants were mothers with infants and toddlers living within the service area of Puskesmas Sako. In the initial stage, the community service team conducted problem identification and assessed the information needs of the target population. The results of the assessment were used as a basis for developing nutrition education materials. Subsequently, the team prepared educational materials related to children's nutritional needs and organized the SiDu Card simulation game. The program activities were then followed by training sessions for health centre staff and community health volunteers (cadres), who served as facilitators for the SiDu Card simulation game. After the training was completed, the team delivered health education using a lecture method. A pre-test was administered before the educational session to assess the participants' baseline knowledge. The activity then continued with a simulation game using the SiDu Card, facilitated by the trained health cadres. Finally, a post-test was conducted to evaluate mothers' knowledge after receiving the combination of nutrition education and the SiDu Card simulation game.

RESULTS AND DISCUSSION

This community service program focused on education and community empowerment related to stunting prevention and the fulfilment of children's nutritional needs. The target participants were 30 mothers with infants and toddlers residing in the working area of Puskesmas Sako, Palembang. The program began with problem identification and an assessment of the participants' information needs. The findings from the assessment were subsequently presented to representatives of Puskesmas Sako and used as the basis for discussing the activity plan. During the coordination meeting, the health centre staff welcomed the community service team and actively provided suggestions regarding the implementation of the program.



Figure 1. Problem identification process and the coordination meeting with representatives from Puskesmas Sako

The community service team then developed educational materials on children's nutritional needs and prepared the SiDu Card simulation game. SiDu Card, which stands for Stunting Education Card, is an educational medium developed from the research team's previous study and has been granted Intellectual Property Rights (IPR). The game was adapted from an educational card game and consists of question cards and answer cards containing health messages related to stunting prevention.



Figure 2. SiDu card question and answer cards

The next stage involved training health centre staff and community health volunteers (cadres) to serve as facilitators of the SiDu Card simulation game. During the training session, health centre staff and cadres were introduced to the SiDu Card and received practical demonstrations on its use as an educational tool.



Figure 3. Overview of support from the community health centre/cadres as facilitators of the SiDu Card simulation games

In playing the SiDu Card game, each participant was asked to select a question card and identify the corresponding answer card related to stunting prevention. Participants then read their selected answers aloud to the group, while the other participants listened and engaged in the discussion. The facilitators, consisting of community service team members and health cadres, asked participants to explain the reasons behind their answers before confirming whether the responses were correct or incorrect. When a correct answer was given, the facilitators reinforced the key educational messages related to stunting prevention. This

interactive approach encouraged active discussion among participants in an enjoyable and engaging learning environment.

Following the training of health centre staff and cadres, the community service team conducted a health education session. The educational materials focused on stunting and the fulfilment of children's nutritional needs. Before the educational session, a pre-test was administered to assess participants' baseline knowledge. The results of the pre-test are presented in Table 1.

Table 1. *Frequency distribution of mothers' knowledge before education (n=30)*

Knowledge	Frequency (n)	%
Good	11	36.7
Enough	17	56.7
Less	2	6.6

The results showed that only 11 mothers (36.7%) had good knowledge regarding stunting and children's nutritional requirements. Further analysis revealed that many participants still had limited understanding of the impacts of stunting and strategies for its prevention.

The health education session was delivered using a lecture method and lasted approximately 30 minutes. To maintain participants' interest, the educational materials were designed to be visually appealing and were presented interactively. After the presentation, a question-and-answer session was conducted. During this session, participants showed considerable enthusiasm and actively asked questions related to the topics discussed.



Figure 4. *Nutrition education and SiDu Card simulation game*

The program continued with education on stunting prevention using the SiDu Card simulation game for mothers with infants and toddlers. Following the combination of health education and the SiDu Card simulation game, a post-test was administered to assess participants' knowledge after the educational intervention. Based on the post-test results, changes were observed in mothers' knowledge regarding stunting prevention, as shown below.

Table 2. *Frequency distribution of mothers' knowledge after education (n=30)*

Knowledge	Frequency (n)	%
Good	22	76.7
Enough	8	23.3
Less	0	0

The proportion of mothers with good knowledge increased from 36.7% before the intervention to 76.7% after the intervention. These findings indicate an improvement in

participants' knowledge following the educational intervention. Health education delivered through the lecture method facilitates direct interaction and discussion between participants and educators (Nahak et al., 2022). After the nutrition education session, participants engaged in the SiDu Card simulation game. The participants were enthusiastic and paid close attention to the materials presented throughout the activity. The use of the SiDu Card simulation game as part of the educational intervention may have contributed to the observed improvement in knowledge.

According to Pakpahan et al. (2021), simulation games offer several advantages in health promotion because they actively involve participants in the learning process, enabling them to participate directly throughout educational activities. This finding is also consistent with Edgar Dale's Cone of Experience Theory, which suggests that learning activities involving direct participation and concrete experiences enhance understanding and information retention compared with passive learning methods (Sarkar, 2023). Furthermore, this finding is consistent with a study conducted by Kusumawati et al., (2022), which reported that card-based educational games encouraged participants to actively think and respond to questions related to maternal health, thereby supporting adequate preparation during the first 1,000 days of life.

Similarly, Fitriani et al. (2021) found that participants showed high enthusiasm when learning through educational card games, which helped them better understand the information delivered. Furthermore, the study reported a significant increase in participants' mean knowledge scores following the intervention ($p\text{-value} = 0.000 < 0.05$). Based on these findings, the community service team assumes that the combination of health education and the SiDu Card simulation game can enhance participants' active involvement in the learning process. Increased engagement may facilitate greater absorption of information, which in turn contributes to improved knowledge regarding stunting prevention.

CONCLUSION

This community service program was effective in improving mothers' knowledge of stunting prevention through a combination of nutrition education and the SiDu Card simulation game. The integration of educational sessions and interactive simulation activities helped participants gain a better understanding of children's nutritional needs and appropriate strategies for preventing stunting. As a community empowerment effort, the program demonstrated promising potential in supporting stunting prevention and promoting child health within the community. It is recommended that Puskesmas regularly implement nutrition education activities using the SiDu Card as an educational medium to strengthen mothers' knowledge and awareness regarding child nutrition and stunting prevention. Continuous mentoring and training for community health cadres are also needed to enhance their capacity to deliver health education and facilitate simulation-based learning activities. Furthermore, mothers are encouraged to apply the knowledge gained during the program by providing age-appropriate nutrition to support optimal health outcomes.

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