



THE INFLUENCE OF STUNTING PREVENTION CARDS ON IMPROVING THE KNOWLEDGE OF ADOLESCENT GIRLS

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Abstract

Background: Stunting is one of the health issues. Prevention efforts for stunting include interventions targeted at various life stages, such as adolescence and preconception. The purpose of this study was to examine the influence of stunting prevention cards in enhancing the knowledge of adolescent girls to prevent stunting. **Method:** This study employed a Pre-Experimental Design with a One Group Pretest–Posttest Design, involving a sample size of 50 respondents. Data were collected using a knowledge questionnaire consisting of 10 items, each with 4 multiple-choice answer categories, with a maximum score of 100 and a minimum score of 10. The questionnaire was distributed to all respondents before the game, and the time for questionnaire completion was 20–25 minutes (pre-test). Subsequently, respondents were given 10 minutes to read the explanations of categories found on the stunting prevention cards. Afterward, a game lasting 1 hour was conducted, followed by a question and answer session lasting 25–30 minutes. Finally, respondents were given a 30-minute break before being provided with the same questionnaire again, with a questionnaire completion time of 25–30 minutes (post-test). Data were processed and analyzed univariately and bivariate using the T-test. The research results were then presented in tables and narrative form. **Result:** The statistical test yielded a p-value of 0.000 or $p < 0.05$. This indicates that the stunting prevention cards significantly influenced the increase in the knowledge level of adolescent girls. **Conclusion:** The higher the level of knowledge among adolescents, the better they are at preventing stunting.

keyword: Knowledge, adolescence, stunting prevention card, stunting,

INTRODUCTION

Children under the age of five are vulnerable to stunting, which is a health issue characterized by impaired growth and low height according to the criteria of the World Health Organization (Nur Amalia, Setiani, and Hanani Darundati 2023). According to the researchers, reduced productivity, low achievement, and decreased cognitive function are some of the impacts associated with stunting (Utami, Setiawan, and Fitriyani 2019). There were 40% of toddlers suffering from stunting (Momenimovahed and Salehiniya 2019). UNICEF reports that 40% of toddlers worldwide suffer from stunting, affecting one in three children under the





age of five (Nur Amalia et al. 2023). In toddlers, stunting is often associated with dietary issues such as malnutrition and poor nutrient absorption (Quamme and Iversen 2022). The research found that family characteristics, nutritional parenting patterns, birth weight and length, maternal and household head education levels, early marriage, clean and healthy living behaviors, and emotional disturbances in adolescent mothers are associated with the occurrence of stunting. Additionally, indirectly, the environment also influences the incidence of stunting (Adelbertha et al. 2022; Utami et al. 2019). The prevalence of stunting varies between boys and girls, with boys having a higher rate of 48.8% compared to girls at 37.8% (Utami et al. 2019).

Improving nutrition, cleanliness, and sanitation as efforts to address stunting (Wicaksono and Harsanti 2020). Stunting prevention efforts often involve a series of interventions targeted at various life stages, such as adolescence and preconception. Research has emphasized the importance of interventions for adolescent girls, including micronutrient intake, preventing early marriage, and nutritional education (Renyoet, Dary, and Nugroho 2023). Early nutrition strengthening for females as future mothers is necessary to prepare the female body for the fetal development phase (Saleh et al. 2021). However, research indicates that the level of adolescent knowledge related to stunting is still low (Suryani, Djannah, and Kodriati 2023). Therefore, various innovative learning media are being researched as an effort to enhance adolescent knowledge related to stunting, such as the use of podcasts (Rahayu et al. 2022), social media platforms such as TikTok, Instagram, Twitter, YouTube, and Facebook (Marlinawati, Rahfiludin, and Mustofa 2023), and booklet media (Sriwiyanti et al. 2022), significantly increased the knowledge of adolescent girls related to stunting prevention. Additionally, innovations in educational methods are also needed to capture the interest of adolescents. This is in line with research stating that interactive methods during education significantly improve adolescent knowledge (Maharani et al. 2022).

Furthermore, research has emphasized the need to understand the behavior of adolescents, especially their curiosity and emotional development, as part of their psychological and cognitive development (Diem-Wille and Mcquade 2020). Game-based educational approaches can be used as a learning tool for adolescents

(Johnston, Wildy, and Shand 2023). Play-based learning has become an essential approach to encourage adolescent participation and develop comprehensive skills (Parker, Thomsen, and Berry 2022). Based on that, a game-based learning media was developed, adopting the concept of quartet card games, known as stunting prevention cards.

Stunting prevention cards are a card game adopted from quartet card games. It consists of 30 cards with images and information on how to prevent stunting, including the definition of stunting, causes of stunting, the impact of stunting, and stunting prevention efforts for adolescents, covering information related to early marriage, nutrition in adolescents, and preventing anemia in adolescents. Therefore, each card set contains 6 cards, each presenting comprehensive information (Samsiyah, Hermansyah, and Kuswidyanarko 2021; Sumargono et al. 2020). This educational media was chosen because it could capture the interest and attention of adolescents in the educational content provided (Nurfaizah, Rahman, and Rahmadani 2021). Based on that, the aim of this research was to examine the impact of stunting prevention cards on increasing the knowledge of adolescent girls as an effort to prevent stunting.

METHOD

This research utilized a Pre-Experimental Design with a One Group Pretest–Posttest Design. The study was conducted at SMAN 1 Sindue from May 24 to June 23, 2023. The sample for this study consisted of adolescent girls at SMAN 1 Sindue, and the sample size was determined using the Slovin formula, resulting in 50 respondents. The sampling technique employed proportional random sampling, with each class selecting 10 respondents. The dependent variable in this study was the knowledge of adolescent girls, and the independent variable was the stunting prevention cards. The rules for playing the stunting prevention cards included forming groups of 4 people. Each person in the group had to collect 6 cards in the order of topics on preventing stunting to become the winner. The game was played for 1 hour or until three winners were determined.

The game begins when one player shuffles the cards and deals them to each participant, with each player receiving 4 cards. The remaining cards are placed in



the middle of the table with their faces down. The game is played clockwise. After each player receives their cards, they engage in a coin toss to determine the first player. The first player announces the desired category; if none of the players have a card in that category, the first player must pick a card from the pile in the middle. Next, the second player announces the desired category. If any other player has a card in that category, they must give their card to the second player. If no other player has a card in the announced category, the second player must pick a card from the middle. If a player collects all the items in a category and becomes the winner, they must explain the cards (simultaneously with a Q&A session). If a player hasn't collected all the items in the category, the game continues to the next player. The above steps are repeated until all the cards are used up, and a winner is determined.

Data was collected using a knowledge questionnaire consisting of 10 questions, with each question comprising 4 multiple-choice answer categories. The maximum score for each item was 100, and the minimum score was 10. The questionnaire was distributed to all respondents before the game, and the time allocated for questionnaire completion was 20-25 minutes (pre-test). Afterward, respondents were given 10 minutes to read the explanations of the categories on the stunting prevention cards. Subsequently, the game was played for 1 hour, followed by a Q&A session lasting 25-30 minutes. At the end, respondents were given a 30-minute break, and then the same questionnaire was administered again with a time frame of 25-30 minutes for completion (post-test). The data were processed and analyzed univariately and bivariately using the T-test. The research findings were then presented in tables and a narrative format.

RESULT AND DISCUSSION

Result

The results of the distribution of respondent characteristic frequencies will be presented

Table 1. Distribution of respondent characteristic frequencies

Age	F	%
14 Year	1	2
15 Year	11	22

16 Year	32	64
17 Year	6	12
Total	50	100

Table 1 shows that the most sampled respondent characteristic is the age of 16, with 32 respondents (64%).

The following presents the results of the distribution of respondent knowledge levels before and after the intervention.

Table 2. Distribution of respondent knowledge levels

Knowledge	Pretest		Posttest	
	<i>f</i>	%	<i>f</i>	%
Good	6	12,0	27	54,0
Moderate	18	36,0	18	36,0
Low	26	52,0	5	10,0
Total	50	100	50	100

Table 2 indicates that the knowledge level of respondents before the intervention was most prevalent in the "Low" category, with 26 respondents (52%), and after the intervention, there was an increase in the knowledge level, with 27 respondents (54%) falling into the "Good" category.

The results of the variance analysis using the Paired Sample T-Test are as follows:

Table 3. The Influence of Stunting Prevention Cards on the Knowledge Level of Adolescent Girls

Knowledge	Mean	P-Value
Pretest- Posttest	22	0,000

Table 3 indicates that the statistical test results yielded a p-value = 0.000, or $p < 0.05$. This suggests that stunting prevention cards significantly influence the increase in the knowledge level of adolescent girls.

Preventing stunting in adolescent girls has an impact on the health and well-being of future generations. Various interventions have been provided to adolescent girls, including educational interventions on nutrition, stunting, early marriage, hygiene, sanitation, and the fulfillment of micronutrients (Renyonet et al. 2023). Despite these interventions, social media-based health education has proven to be successful in preventing stunting in adolescents (Marlinawati et al. 2023).

The results of this study indicate the influence of stunting prevention cards on the improvement of knowledge in adolescent girls. This increase in knowledge



occurs through the provision of health education on preventing stunting in adolescents, conducted collaboratively with peers, consisting of four individuals in one group. The educational approach involves playing a game using stunting prevention cards, where each card contains fragmented information on preventing stunting in adolescents. Participants must assemble six stunting prevention cards to obtain comprehensive information. Through this process of assembling information pieces, respondents receive health education. This aligns with previous research stating that the improvement of adolescent knowledge can occur through health education interventions (Mitra 2020), peer intervention (Mason-Jones et al. 2023), And game-based learning methods (Havizoh, Widyatuti, and Mulyono 2022).

The stunting prevention cards are adapted from the quartet card game. Quartet cards are a type of game consisting of several cards with illustrations, each accompanied by written descriptions explaining the images (Sumargono et al. 2020). The quartet card game was adopted by the researcher as an educational medium because several studies indicate that adolescents who learn through play receive numerous benefits, divided into various categories, including physical development (Eime et al. 2013; Nijhof et al. 2018), emotional development (Eime et al. 2013), cognitive development (Nijhof et al. 2018), social development (Eime et al. 2013), positive behavioral development (Vlachopoulos and Makri 2017), improved readiness and comfort during learning (Jensen and Rørbæk 2022), and fostering positive experiences, personal growth in competition, confidence, connections, empathy, character, and contribution (Worker et al. 2019).

The improvement of knowledge in adolescent girls regarding stunting prevention will have an impact on changing the behavior of adolescent girls related to sensitive nutritional fulfillment. For example, regularly taking iron supplements during menstruation, avoiding early marriage, and maintaining personal hygiene

CONCLUSION AND SUGGESTION

The use of stunting prevention cards significantly enhances adolescents' knowledge about preventing stunting in their age group. The higher the level of adolescents' knowledge, the better they are prevented from stunting. Schools and healthcare professionals can provide support and innovation in delivering health education. It

is hoped that future researchers can develop more creative and innovative methods and media for health education aimed at adolescents

DECLARATION

Conflict of Interest

There is no Conflict of interest in this Study.

Authors' Contribution

All the authors involved in every stage of the research, from the initial concept to the drafting of the article.

Ethical Approval

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Data Availability

Available data requested.

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REFERENCE

Adelbertha, A. ..., Namita Candra Devi, Rita Oktavia Harahap, and Astika Gita Ningrum. 2022. "The Association Of Adolescent Pregnancy With Stunting Incidence In Child Under Five Years Old; Literatur Review." *Jurnal Sosial Dan Sains* 2(11):1241–50. doi: The Association Of Adolescent Pregnancy



- With Stunting Incidence In Child Under Five Years Old.
- Diem-Wille, Gertraud, and Benjamin Mcquade. 2020. *The Search for the Self – Identity*.
- Eime, Rochelle M., Janet A. Young, Jack T. Harvey, Melanie J. Charity, and Warren R. Payne. 2013. “A Systematic Review of the Psychological and Social Benefits of Participation in Sport for Children and Adolescents: Informing Development of a Conceptual Model of Health through Sport.” *International Journal of Behavioral Nutrition and Physical Activity* 10(1):98. doi: 10.1186/1479-5868-10-98.
- Havizoh, Havizoh, Widyatuti Widyatuti, and Sigit Mulyono. 2022. “Implications of Video Game-Based Education for Adolescents’ Smoking Knowledge and Perceptions.” *Sri Lanka Journal of Child Health* 51(1):62. doi: 10.4038/sljch.v51i1.9997.
- Jensen, Hanne, and Lasse Lykke Rørbæk. 2022. “Smoothing the Path to Practice: Playful Learning Raises Study Happiness and Confidence in Future Roles among Student Teachers and Student ECE Teachers.” *Studies in Educational Evaluation* 74:101156. doi: 10.1016/j.stueduc.2022.101156.
- Johnston, Olivia, Helen Wildy, and Jennifer Shand. 2023. “Teenagers Learn through Play Too: Communicating High Expectations through a Playful Learning Approach.” *The Australian Educational Researcher* 50(3):921–40. doi: 10.1007/s13384-022-00534-3.
- Maharani, Livia Putri, Novita Putri, Eka Wardani, Naila Khoirun Naili, and Rismawan Adi Yunanto. 2022. “The Effect of an Interactive Health Education on Increasing Knowledge About Stunting in Adolescents At Rural of Mayang Pengaruh Pendidikan Kesehatan Secara Interaktif Terhadap Peningkatan Pengetahuan Tentang Stunting Pada Remaja Desa Mayang.” *Berkala Ilmiah Mahasiswa Ilmu Keperawatan Indonesia* 10(2):145.
- Marlinawati, Dwi Ayu, Mohammad Zen Rahfiludin, and Syamsulhuda Budi Mustofa. 2023. “Effectiveness of Media-Based Health Education on Stunting Prevention in Adolescents: A Systematic Review.” *AgriHealth: Journal of Agri-Food, Nutrition and Public Health* 4(2):102. doi: 10.20961/agrihealth.v4i2.71357.
- Mason-Jones, Amanda J., Marlon Freeman, Theo Lorenc, Tina Rawal, Shalini Bassi, and Monika Arora. 2023. “Can Peer-Based Interventions Improve Adolescent Sexual and Reproductive Health Outcomes? An Overview of Reviews.” *Journal of Adolescent Health* 73(6):975–82. doi: 10.1016/j.jadohealth.2023.05.035.
- Mitra. 2020. “Adolescent Knowledge of Anemia and Iron Supplement Consumption Before and After Health Education.” *International Journal of Science and Society* 2(4):10–18. doi: 10.54783/ijssoc.v2i4.187.
- Momenimovahed, Zohre, and Hamid Salehiniya. 2019. “Epidemiological Characteristics of and Risk Factors for Breast Cancer in the World.” *Breast Cancer: Targets and Therapy* Volume 11:151–64. doi: 10.2147/BCTT.S176070.
- Nijhof, Sanne L., Christiaan H. Vinkers, Stefan M. van Geelen, Sasja N. Duijff, E. J. Marijke Achterberg, Janjaap van der Net, Remco C. Veltkamp, Martha A. Grootenhuis, Elise M. van de Putte, Manon H. J. Hillegers, Anneke W. van der Brug, Corette J. Wierenga, Manon J. N. L. Benders, Rutger C. M. E.

- Engels, C. Kors van der Ent, Louk J. M. J. Vanderschuren, and Heidi M. B. Lesscher. 2018. "Healthy Play, Better Coping: The Importance of Play for the Development of Children in Health and Disease." *Neuroscience & Biobehavioral Reviews* 95:421–29. doi: 10.1016/j.neubiorev.2018.09.024.
- Nur Amalia, Ilmy, Onny Setiani, and Yusniar Hanani Darundati. 2023. "Environmental Factors Associated with Incidence of Stunting in Toddlers: Literature Review." *Jurnal Serambi Engineering* 8(3):6736–43. doi: 10.32672/jse.v8i3.5740.
- Nurfaizah, Abdul Rahman, and Amaliyah Rahmadani. 2021. "Pengaruh Penggunaan Media Permainan Kartu Kuartet Terhadap Minat Belajar IPS Siswa Sekolah Dasar." 1(3):196–204.
- Parker, Rachel, Bo Stjerne Thomsen, and Amy Berry. 2022. "Learning Through Play at School – A Framework for Policy and Practice." *Frontiers in Education* 7. doi: 10.3389/educ.2022.751801.
- Quamme, Siri Hundstad, and Per Ole Iversen. 2022. "Prevalence of Child Stunting in Sub-Saharan Africa and Its Risk Factors." *Clinical Nutrition Open Science* 42:49–61. doi: 10.1016/j.nutos.2022.01.009.
- Rahayu, S., Maria Alia Rahayu, Nelly Apriningrum, Chairudin Chairudin, Asep Asep, and Neng Ulya. 2022. "The Role of Youth in the Stunting Prevention via Podcast in Karawang Regency 2020." *Interdisciplinary Social Studies* 1(8):1079–85. doi: 10.55324/iss.v1i8.185.
- Renyoet, Brigitte Sarah, Dary Dary, and Christantya Vita Rena Nugroho. 2023. "Literatur Review: Intervensi Pada Remaja Perempuan 8000 Hari Pertama Kehidupan (HPK) Sebagai Upaya Pencegahan Stunting Pada Generasi Di Masa Depan." *Amerta Nutrition* 7(2):295–306. doi: 10.20473/amnt.v7i2.2023.295-306.
- Saleh, Ariyanti, Syahrul Syahrul, Veni Hadju, Irma Andriani, and Indah Restika. 2021. "Role of Maternal in Preventing Stunting: A Systematic Review." *Gaceta Sanitaria* 35:S576–82. doi: 10.1016/j.gaceta.2021.10.087.
- Samsiyah, Siti, Hermansyah Hermansyah, and Arief Kuswidyanarko. 2021. "Efektivitas Kartu Kuartet Terhadap Kemampuan Pemahaman Siswa Pada Mata Pelajaran Ips Kelas Iv." *Jurnal Holistika* 5(2):119. doi: 10.24853/holistika.5.2.119-126.
- Sriwiyanti, Sri Hartati, Dodi Aflika F, and Muzakar. 2022. "Effectiveness of Nutritional Education on Knowledge and Adolescent Attitudes About Stunting in High School." *Journal of Applied Nursing and Health* 4(1):16–22. doi: 10.55018/janh.v4i1.30.
- Sumargono, Sumargono, Lisnawati Lisnawati, Siti Rohmayani, and Masdi Masdi. 2020. "Kartu Kuartet Boelang (Boedaya Lampung) Sebagai Media Edukasi Boedaya Lokal Di Smpn Bandarlampung." *HISTORIA : Jurnal Program Studi Pendidikan Sejarah* 7(2):243. doi: 10.24127/hj.v7i2.2108.
- Suryani, Dyah, Sitti Nur Djannah, and Nurul Kodriati. 2023. "Analysis of Relationship between the Level of Knowledge on Stunting and Socio-Demographic Characteristics among Students Faculty of Public Health , Universitas Ahmad Dahlan , Yogyakarta , Indonesia." 17(1):211–17.
- Utami, Ressa Andriyanu, Agus Setiawan, and Poppy Fitriyani. 2019. "Identifying Causal Risk Factors for Stunting in Children under Five Years of Age in South Jakarta, Indonesia." *Enfermeria Clinica* 29:606–11. doi:



- 10.1016/j.enfcli.2019.04.093.
- Vlachopoulos, Dimitrios, and Agoritsa Makri. 2017. "The Effect of Games and Simulations on Higher Education: A Systematic Literature Review." *International Journal of Educational Technology in Higher Education* 14(1):22. doi: 10.1186/s41239-017-0062-1.
- Wicaksono, Febri, and Titik Harsanti. 2020. "Determinants of Stunted Children in Indonesia: A Multilevelanalysis at the Individual, Household, and Community Levels." *Kesmas* 15(1):48–53. doi: 10.21109/kesmas.v15i1.2771.
- Worker, Steven M., Anne M. Iaccopucci, Marianne Bird, and Marcel Horowitz. 2019. "Promoting Positive Youth Development Through Teenagers-as-Teachers Programs." *Journal of Adolescent Research* 34(1):30–54. doi: 10.1177/0743558418764089.