



Peer Group Education and Healthy Snacking for Adolescent Girls (Prospective Mothers) in Islamic Boarding Schools as an Effort to Reduce the Number of Stunting Cases



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Article Information

History Article:

Received, 22/09/2025

Accepted, 18/11/2025

Published, 28/11/2025

Keywords:

Adolescent Girls;

Stunting; Peergroup

Education; Healthy

Snacking; Nutrition

Abstract

Young women, as prospective mothers, needed to prepare themselves to give birth to a quality generation. Preventing stunting in adolescents involved increasing knowledge and awareness of the use of local foods. The partner in this community service program was the Madrosatul Qur'an Hidayatul Mubtadiin Islamic Boarding School. The goal of this community service program for beginners was to increase the knowledge and awareness of young women (prospective mothers) at the Islamic boarding school regarding the importance of balanced nutrition for stunting prevention from adolescence, encourage healthy snacking habits based on local foods, increase access to nutritious food to support healthy nutrition for adolescents as a stunting prevention effort, and develop adolescent health cadres capable of becoming agents of change within the Islamic boarding school and the surrounding community. The results of data analysis using the Wilcoxon signed rank test obtained $P = 0.000$, so it was concluded that the provision of peer group education could increase the knowledge and awareness of young women (prospective mothers) regarding the importance of balanced nutrition for preventing stunting since adolescence and that was achieved was that the students exhibited very good healthy snacking behavior (88%) and fairly good healthy snacking behavior (12%). This service encouraged healthy snacking habits to fulfil balanced nutrition for students, increased access to nutritious food to support nutritional fulfillment as an effort to prevent stunting by modifying a healthy canteen, and built health cadres of adolescent cadres who were able to become agents of change in the community.

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DOI: <https://doi.org/10.26699/jcsh.v6i2.1261>

E-ISSN: 2746-5195

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INTRODUCTION

One of the health indicators that assesses the success of achieving the Sustainable Development Goals (SDGs) is finding sustainable solutions to end hunger and all forms of malnutrition and to achieve food security by 2030 ([Indriyastuti & Kartono, 2022](#)). Currently, Indonesia has three nutritional problems (triple burden), namely stunting, wasting and obesity as well as micronutrient deficiencies such as anemia. Nutritional status data based on the 2023 SKI shows the category of stunting in adolescents aged 13-15 years as much as 18.3% and adolescents aged 16-18 years 17.1% ([BPS, 2018](#)). Malnutrition in adolescents will have an impact on increasing stunting rates in Indonesia. Adolescence is a transition period from childhood to adulthood, which ranges from 12-21 years for girls and 13-22 years for boys. Adolescents, especially adolescent girls as prospective mothers, need to prepare themselves to give birth to a quality generation ([Asatuti et al., 2021](#)). Prevent stunting in adolescents by increasing knowledge and awareness of the use of local foods. Stunting remains a critical health problem in Indonesia. The "Accelerating Stunting Reduction" program targets adolescents as a key group. This reflects the understanding that adolescents play a crucial role in addressing stunting, both as prospective parents and as individuals who can experience the negative impacts of malnutrition, which ultimately contributes to stunting ([Aini et al., 2024](#)).

Preventing stunting in adolescent girls involves not only increasing consumption of good nutrition but also raising awareness of the importance of a healthy diet based on locally sourced foods. In this context, education about nutrition and healthy eating patterns, which can be provided through peer group education, is crucial ([Ika Indriyastuti et al., 2022](#)). Adolescent girls who are aware of the importance of adequate and balanced nutrition, and understand its impact on long-term health, can be more active in preventing stunting in future generations. Therefore, programs targeting adolescent girls as prospective mothers need to strengthen their empowerment to prioritize nutritious foods from easily accessible local food sources, while simultaneously developing healthy eating habits that can be passed on to their future children.

The community service program for beginners is to increase the knowledge and

awareness of young women (prospective mothers) in Islamic boarding schools regarding the importance of balanced nutrition for preventing stunting from adolescence, encourage the habit of fulfilling adolescent nutritional needs by snacking on healthy local food, increase access to nutritious food to support the fulfillment of healthy adolescent nutrition with a healthy canteen as an effort to prevent stunting, and build adolescent health cadres who are able to become agents of change in the Islamic boarding school environment and the surrounding community.

METHOD

The methods and five stages of implementing this community service program include:

Program Socialization Activities

Methods: Socialization of the program to female students, caregivers, and the surrounding community who contribute to the students' nutritional needs (canteen owners near the Islamic boarding school). This was followed by a pre-test assessment of the students' knowledge about stunting and their snacking habits. This was followed by the formation of a "stunting prevention and healthy snacking" cadre from the students.

Training Activities on stunting and adolescent nutritional needs as a stunting prevention effort using peer group education methods

a. Implementation: Modifying the existing canteen into a healthy canteen that provides healthy snacks.

Methods: FGDs with canteen managers/owners to discuss efforts to ensure students have access to healthy food through the available canteen, providing mentoring to the canteen managers/owners, and modifying the existing canteen into a healthy canteen that provides healthy snacks.

b. Training on healthy snack making for students, caretakers, and snack providers within the boarding school environment, as well as encouraging female students to snack healthily.

Method: Pre-test assessment of the knowledge and skills of students (cadres), caretakers, and snack providers on healthy snack making. The service team then created a menu/recipe book for healthy snacks and provided training on how to prepare healthy foods using local food sources to cadres, caretakers, and snack providers on healthy snack

making. At the end of the activity, a post-test was conducted on the knowledge and skills of students (cadres), caretakers, and snack providers on healthy snack making. Motivation and evaluation of the implementation of the healthy snacking program were continued and students were encouraged to snack healthily for one month.

Technology Application

Method: Training on how to prepare healthy foods using local food sources to cadres, caretakers, and snack providers on healthy snack making was conducted. Healthy food was distributed to the students. The peer education program for the students is based on the snakes and ladders game often played by teenagers. Each step/box contains questions related to stunting and nutritional status that can be discussed with peers. Healthy snacks are also prepared based on recipes written by nutritionists, ensuring both taste and benefits. The healthy canteen is managed by the orphanage administrators, who will continue to assist the canteen manager or owner in ensuring healthy food is always available.

Mentoring and Evaluation

Method: Evaluate the students' knowledge of nutrition and stunting to assess their cognitive abilities. After the peer education program is implemented, the next activity is to encourage the students to snack healthily for one month. To ensure sustainability, the cadres are tasked with motivating and evaluating the implementation of the healthy snacking program, ensuring a minimum of two to three healthy meals per week. The healthy canteen is managed by the orphanage administrators, who will continue to assist the canteen manager or owner in ensuring healthy food is always available.

Program Sustainability

Method: This program will be continued by female youth cadres, accompanied by student officers, as a stunting prevention program for female youth to improve the nutritional status of female youth in Islamic boarding schools.

RESULTS.

The following image is the implementation of peer group education to increase the knowledge of students.



Picture 1. Peergroup Education

One of the main activities in this community service program is peer group education, involving female students as the primary participants. This activity aims to increase their knowledge about stunting and balanced nutrition. Prior to the program, a pre-test was conducted to measure the students' knowledge of stunting and nutrition. The results showed that most students lacked in-depth understanding of stunting and the importance of a healthy diet. A youth cadre was then formed. As part of the program's sustainability, older female students were involved in the formation of the youth health cadre. These cadres are tasked with supervising and educating their younger siblings about the importance of healthy eating and maintaining a balanced diet. This activity aims to develop agents of change who can motivate and educate their peers about stunting prevention and healthy eating habits.

Following the education on stunting and nutritional fulfillment, a post-test was conducted to measure knowledge gains. The analysis showed a significant increase in the students' understanding of stunting and balanced nutrition. Initially, during the pretest, there was 1 student with low knowledge, 15 students with moderate knowledge, and 17 students

with good knowledge. After the posttest, only 3 students had moderate knowledge and 30 students had good knowledge, meaning that 91% experienced an increase.

Results of the Local Food-Based Healthy Snacking Program

The following image shows the implementation of the healthy snack-making training.



Picture 2. Implementation of the healthy snack making training

A healthy snacking program based on local food was also implemented as part of this community service program. Through healthy snack-making training, female students were taught how to make healthy snacks using local ingredients found around the Islamic boarding school, according to a recipe book created by a nutritionist, such as leeks, nuts, chicken, and fruit. All female students and the school's caretakers participated in this training. The goal was to encourage the students to adopt healthy snacking habits as part of a balanced diet.

Furthermore, an evaluation was conducted to assess changes in the students' snacking habits after the training until one month. Results showed that

88% of the students demonstrated excellent healthy snacking behaviors, while 12% demonstrated moderately good healthy snacking behaviors. This program successfully raised awareness among the students about the importance of choosing healthy, nutritious snacks to prevent stunting.

Modifying the Canteen into a Healthy Canteen

One important step in supporting healthy snacking habits is to modify the canteen within the Islamic boarding school environment. Previously, the canteen often sold snacks containing flavorings and lacking in nutrition. This activity provided training to canteen managers and snack vendors around the Islamic boarding school to provide healthy and nutritious food. Through training, participants were taught how to modify the existing menu by adding healthy snacks based on local foods. The canteen, which previously only served unhealthy snacks, now offers more nutritious food options, such as tempeh rolade, mung bean pudding, tempeh nuggets, banana rolls, siomay, and various snacks made from more nutritious local ingredients, as well as several healthy juices.

DISCUSSION

Stunting is a serious health problem in Indonesia, impacting the quality of future generations. According to WHO data, stunting among children in Indonesia is high, with a prevalence of 30.8% in 2022. Stunting not only affects physical growth but also brain development, which in turn affects a child's future intelligence and abilities. In this context, preventing stunting in adolescent girls, especially expectant mothers, is crucial. Girls who experience malnutrition during adolescence are at higher risk of giving birth to stunted children. Therefore, nutrition education starting in adolescence is crucial to breaking the chain of stunting problems in Indonesia ([Beal et al., 2018](#); [Tarini et al., 2020](#)).

Peer-based education is an effective method for increasing adolescent knowledge about the importance of a healthy and nutritious diet. This program aims to raise awareness among adolescent girls, most of whom are transitioning to adulthood, about the importance of adequate and balanced nutrition. In a study conducted by ([Aktyani Putri & Romadhon, 2024](#)), the implementation of peer-based education in Islamic boarding schools (*pesantren*) was proven to be successful in increasing students' knowledge and understanding

regarding stunting prevention through healthy eating. Before participating in the program, many students did not fully understand the negative impacts of malnutrition during adolescence, both on their own health and on the children, they will have in the future. After participating in the training, there was a significant increase in their understanding of balanced nutrition and stunting. As many as 91% of students experienced a significant increase in knowledge, demonstrating that peer-based education can be an effective tool in changing adolescents' mindsets and behaviors regarding healthy eating.

Female Islamic boarding school students rarely eat breakfast and dinner. If they still have pocket money, they prefer to buy snacks at nearby stalls, such as packaged snacks containing lots of flavorings, instant noodles, and sachet drinks that are relatively cheap. In Islamic boarding schools and schools, there are canteens that used to sell healthy foods such as sticky rice and rujak, but these never sold well, so they ended up selling the same food as stalls outside the Islamic boarding school and school. Therefore, it can be concluded that there is no canteen that provides healthy snacks. This shows that socio-economic factors can influence habits in healthy living behaviors, especially in fulfilling nutritional needs as an effort to prevent stunting. (Aktyani Putri & Romadhon, 2024). Teenagers who experience nutritional problems will have an impact on the quality of human resources (HR) which can result in the loss of the younger generation (lost generation) and have an impact on the state of the nation's economy (economic loss) in the future. (Fauzi, 2012 & Lusiana et al., 2021).

Furthermore, unhealthy eating habits, such as consuming snacks containing many non-nutritious additives, significantly contribute to stunting (Dewey, 2016; Vir, 2016). Therefore, training on healthy snacks based on local food ingredients is also an important part of stunting prevention. In this program, students are taught to make healthy snacks using local ingredients available around the Islamic boarding school, such as tempeh, tofu, and various types of nutrient-rich fruits. This healthy snack training program has proven effective, with 88% of students showing very good changes in eating behavior, and another 12% showing fairly good changes in behavior. Through this training, students not only gain knowledge about nutrition but also practical skills in preparing healthy snacks that can

support stunting prevention efforts. Furthermore, the modification of the canteen at the Islamic boarding school to a healthy canteen also supports these healthy eating habits. Previously, the canteen at the Islamic boarding school served many unhealthy snacks that lacked nutrition. However, after training was provided to canteen managers and snack vendors around the Islamic boarding school, the canteen now offers a variety of healthy snacks based on local ingredients that are more nutritious, such as tempeh rolade, siomay, and various other healthy snacks.

Peer education is an educational approach in which individuals with specific knowledge or skills teach or share information with their peers (Zufriady et al., 2022). This approach is highly effective, particularly in public health contexts, because it can create a comfortable and supportive learning environment, where individuals feel more open and confident in sharing and receiving information (Lubis et al., 2022). This program also demonstrates the important role of adolescent health cadres as agents of change within the Islamic boarding school environment. After participating in training and peer group education, students who have gained knowledge about balanced nutrition and stunting are involved in outreach activities for their peers who have not yet participated in the program. Thus, this program not only improves individual student knowledge but also creates an outreach network that can expand its positive impact throughout the Islamic boarding school environment. These adolescent health cadres will play a crucial role in ensuring the sustainability of this stunting prevention program with the support of all parties within the Islamic boarding school, including canteen managers and students' families. The outreach and empowerment activities of these health cadres are expected to ensure the sustainability of the changes in healthy eating behaviors initiated through this program. Overall, peer-to-peer education, conducted in the form of training and counseling on balanced nutrition, healthy snacks based on local ingredients, and canteen modifications at Islamic boarding schools, has proven effective in increasing students' knowledge and changing their behavior. The success of this program can serve as a model for similar programs in other Islamic boarding schools, with the hope of expanding its impact in addressing stunting in Indonesia. Furthermore, this program can also serve

as an important example of how peer-based education and youth empowerment can produce significant changes in public health issues, particularly those related to nutrition and stunting prevention. The sustainability of this program depends heavily on the active role of adolescent health cadres and support from the Islamic boarding school and students.

CONCLUSION

Initially, during the pre-test, 1 student had low knowledge, 15 students had moderate knowledge, and 17 students had good knowledge. After the post-test, only 3 students had moderate knowledge and 30 students had good knowledge. Improvement of Students' "Healthy Snacking" Habits. Students had very good healthy snacking behaviors (88%) and fairly good healthy snacking behaviors (12%) and peer group education can improve the knowledge and awareness of adolescent girls (prospective mothers) at Islamic boarding schools regarding the importance of balanced nutrition for preventing stunting from adolescence.

SUGGESTION

Maintaining a Healthy Diet: It is hoped that the female students will continue to implement the healthy diet taught in this activity, such as choosing healthy snacks. In addition, students are also advised to avoid the habit of consuming instant foods or snacks that are not nutritious, which can have a negative impact on health and growth. **Implementing Balanced Nutrition in Daily Life:** Students must continue to commit to consuming nutritious foods that have been learned, both in the Islamic boarding school canteen and outside the Islamic boarding school environment. By implementing a healthy diet, they participate in creating a generation that is free from stunting.

ACKNOWLEDGMENT

We would like to give our appreciation to KEMENDIKTISAINTEK and STIKes Patria Husada Blitar for supporting our research in all aspects. We also would like to thank all of the respondents that participated in this research.

FUNDING

This research was funded by all of the authors and also supported by Ministry of Education, Culture, Research, and Technology.

CONFLICTS OF INTEREST

The authors declare no conflict of interest. Other funders than the authors had no role in the data collection, data analysis, and also in the writing of the manuscript.

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