

Preventing Stunting Through Health Education and Local Food Innovation: A Community Empowerment Approach

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ABSTRACT

According to Indonesian Law in 2019, any marriage under the minimum age of 19 years old is considered Early Marriage. Early Marriage hurts physical and psychological health, especially in cases followed by a high-risk teenage pregnancy. The risk of Stunting increases with children born to a teenage pregnancy. The prevalence of Stunting remains high in Indonesia, reaching 23.3% in 2024 for Malang Regency. Our community service was initiated in response to Early Marriage and Stunting in Jabung, a village in Malang Regency. Our purpose is to prevent Stunting through health education and local food innovation by using a community empowerment approach. This aims to enhance cadres' knowledge of reproductive health and stunting prevention, develop skills as peer educators, share food innovation recipes based on local products, and increase cadres' understanding of digital marketing. The participants were 30 cadres. The methods were health education lectures, peer educator practice, and cooking demonstrations. After community service showed an increase in cadres' knowledge from the average score pre-test (57.8) to post-test (85), an increase in cadres' skills as educators, an increase in the ability of cadres to make healthy food innovations, and cadres also got new knowledge about digital marketing. After the community service, we hope that cadres can apply the latest knowledge to become better educators and share new recipes based on local food innovations for the wider community, as well as apply marketing strategies to increase the value of the local products, which not only will help to prevent Stunting but also improve family and village economy.

ARTICLE INFO

Article History:

Submitted/Received: 22 Sept. 2025

First Revised: 02 October 2025

Accepted: 10 October 2025

First Available online: 31 October 2025

Publication Date: 31 October 2025

Keyword:

Community Empowerment

Early Marriage

Health Education

Local Food Innovation

Reproductive Health

Stunting

INTRODUCTION

Early marriage poses problems, both from the perspective of Islamic law compilations and within the Marriage Law. Regarding the minimum age for marriage, the Marriage Law refers to Article 7, paragraph 1, of 1974, which was later revised to become Marriage Law Number 16 of 2019, stating that 19 years old is the minimum age for both men and women (Almahisa & Agustian, 2021). Early marriage is a form of violence and a violation of children's rights. This is because the practice of early marriage occurs at the age of <18 years, which triggers violence such as sexual violence (Nisa et al., 2022). Early marriage contributed to the negative impacts on physical and psychological health for women, which is usually followed by a teenage pregnancy as a high-risk pregnancy that contributes to the Maternal Mortality Rate (MMR) (Bahriyah et al., 2021). Several factors that can influence stunting include infectious diseases, exclusive breastfeeding, early initiation of breastfeeding, and early marriage, which are still a concern for the wider community (Windasari et al., 2020). The risk of Stunting increases by 60% among young pregnant women who are still under 20 years old (Fitriahadi, 2018).

Stunting is a chronic malnutrition problem caused by insufficient nutritional intake over a prolonged period due to inadequate feeding. Stunting can occur while the fetus is still in the womb and only becomes apparent when the child is two years old (Rahmadhita, 2020).

Stunting occurs due to inadequate nutritional intake during infancy and in the womb, as well as a mother's lack of insight into parenting. Stunting is a long-term cycle. Children born to anemic and malnourished mothers are at risk of stunting, a phenomenon known as the intergenerational cycle of stunting. The long-term impacts of stunting include delays in a child's intellectual development, disease susceptibility, and decreased productivity (Raksun et al., 2023)

The prevalence of stunting is still high in Indonesia. According to data from the Malang City Health Office in 2024, the stunting incidence in Malang Regency remained at 23.3% in 2024, which is higher than the national target. Jabung Village is one of the villages in Malang City where stunting in toddlers remains a persistent issue. The problems raised in this community service are the ongoing cases of early marriage and the ongoing cases of stunting toddlers in Jabung Village in 2024. Jabung Village is located in the Jabung District area of Malang Regency. In addition to health problems, the population of Jabung Village is generally of productive age (aged 20-49 years), and the majority of the population works as farmers and farm laborers, with milk being the main product. The current focus of development in Jabung Village is on the development of tourism facilities and local UMKM (Micro, Small, and Medium Enterprises) production. Therefore, it is highly appropriate to process local products, such as milk, into nutritious food products that can enhance public health, particularly in efforts to prevent stunting.

Our community service program was initiated by the incident of early marriage and stunting in Jabung Village. Similar programs were done in the past, such as community empowerment with health education about Stunting and its prevention with cadres as participants, with their programs focused on cadres' education and showed a significant increase in cadres' knowledge (Lestari & Hanim, 2020). Our program novelty and strength gave more complete program, not only a health education program but we tried to empower and train health cadre's in Jabung to became peer educator in their community and also to teach them with some local food innovations based on their local products so that the local products can be used to increase their products value and informations about marketing strategies in digital era which also will help to increase the product value and business income, this community service purpose to increase cadres knowledge about health reproductive and stunting preventions, to increase cadres skill as peer educator, to increase cadres knowledge about marketing strategies in

digital era and to teach cadres some innovation recipes based on Jabung local products in hope to not only used the local food innovations to prevent Stunting but also to increase its selling values and later can help family income and village economy.

METHOD

Our community service design was “action-interventions”, which involved implementing interventions in the health sector. These community service activities were conducted for six days, comprising a three-day training session and three days of implementation in Posyandu. The total participants was 30 cadres, namely the mother and child health cadres in Jabung Village. Our participants, numbering 30, were selected through a cluster sampling technique in Jabung Village, which comprises five small villages (Dusun). Each Dusun was required to send 5 participants, resulting in a total of 30 cadres. The weakness of our method was the lack of a control group, which could result in potential bias that should be improved in future programs.

The methods used included health education lectures, discussions, demonstrations, and redemonstrations, peer educator training, learning to create local food innovations, and digital marketing strategies in the digital era. The activities were conducted by lecturers from the Bachelor of Applied Midwifery Program, students of the Bachelor of Applied Midwifery program, the head of the Midwives in Jabung Village, and a professional marketing expert.

Evaluations of the programs utilized knowledge instruments created by the community service team, with pre-post-test one-group only interventions. The analysis employed knowledge analysis and classifications, categorizing results as good, average, or low. For the educator skills, we used a health education instrument from the community service team, which evaluated how the cadres' skills are sufficient for educators, such as how to open an event, explain health issue topics, answer questions, and serve as a peer counselor. Lecturers and the community service team from the midwifery and health promotive program have already verified the instruments.

These community programs were carried out in six days (a 3-day training period and 3 days of implementation in Posyandu, which will be explained below:

- Day 1: Training of Health Reproductive Education and Stunting prevention for cadres with lectures, Q&A sessions, and game education, consists of lectures about reproductive health, healthy pregnancy, child nutrition and parenting, stunting prevention, and how to be a peer educator
- Day 2: Demonstration and redemonstration of the peer educator
- Day 2: Demonstration and redemonstration of cooking local food and herbal ingredients as supplementary foods for toddlers to prevent stunting
- Day 3: Education and practice of marketing strategies, such as the introduction of food innovations that can be made using local and herbal products, how to sell products, how to do effective packaging, and digital market strategies.
- Day 4-6: Implementations in Posyandu

3 days of implementation with cadres serving as educators who share their knowledge about Reproductive Health and Stunting prevention with pregnant women and mothers of toddlers in the three Posyandu. During implementation, the community service team will evaluate the cadres' skills as educators.

RESULTS

These community empowerment and service activities were carried out in six days (a 3-day training period and 3 days of implementation in Posyandu. The facilitator and speaker were lecturers and students from the Bachelor of Applied Midwifery Program, Leader in Jabung City, and a professional marketing expert.

Lecture and Discussion

The presentation was conducted using PowerPoint slides and video presentations. The first half of the topics included women's health education, such as women's reproductive health, preparations for a healthy pregnancy, nutrition for pregnant women, iron supplementation, recognizing pregnancy danger signs, exclusive breastfeeding, complementary feeding for pregnancy, and first aid by cadres. The second half of the topics included topics related to children's nutrition, monitoring children's development, the record system, and stunting prevention. The speakers were lecturers from the Bachelor of Applied Midwifery Program, Malang State Health Polytechnic, Heny Astutik, and Duhita Dyah Apsari.



FIGURE 1. Education with Lecture and Discussion

Demonstration and Redemonstration

Lecturers conducted a simple demonstration as facilitators on how to conduct health education related to pregnant women, toddlers' health, and stunting prevention. In this practice, cadres learned how to be educators or peer educators, enabling them to disseminate information in more accurate and effective ways. Thirty cadres were divided into several small groups, facilitated by lecturers and students from the Bachelor of Applied Midwifery Program. Each group and individual must practice as an educator who will later be assessed using the Health Educator Checklist, which lecturers from the Midwifery and Health Promotion program have already verified.



FIGURE 2. Practice of cadres as peer educators in small groups

Demonstration and Redemonstration of Local Food Innovations (Cooking Local and Herbal Ingredients to make Toddler's supplementary foods to prevent Stunting)

Demonstration of local products and herbal recipes with innovation recipes by community service, cooking local and some herbal ingredients as PMT (Food and Nutritional Supplements) to Prevent Stunting, including various suplementory foods made with milk as Jabung local products and some herbal products such as Chocolate-Temulawak Pudding, Curcumin Jelly, Apple Banana Pudding, Kelor Pudding and Kelor Nuggets, all receipts and innovation created by the community service team. After the demonstration, several participants tried to make the food themselves and later enjoyed it together.



FIGURE 3. Demonstrations Of Cooking Local Food Innovations



FIGURE 4. Chocolate-Temulawak Pudding and Curcumin Jelly



FIGURE 5. Kelor Pudding and Apple-Banana Pudding



FIGURE 6. Moringa Nugget (Nugget Kelor)

Education and Practice

Education and practice of digital marketing strategies, such as the introduction of food innovations that can be made using local and herbal products, how to sell products, how to do effective packaging, and market strategies with the help of digitalization. The speakers were Heny Astutik, presenting her research results on herbal innovations, and Mr. Hery, an expert in marketing strategies and digital marketing.

- Presentation of Material 1: Introduction to Herbal Product Commercialization
- Presentation of Material 2: Product Packaging and Marketing Methods
- Presentation of Material 3: Digitalization of Product Marketing



FIGURE 7. Presentations of Product Packaging and Marketing Methods

Implementation With Cadres as Educators who share their knowledge with pregnant women and mothers in Posyandu



FIGURE 8. Cadres as Educators in Posyandu

Closing Event

The final activity was the closing ceremony. It began with a speech from the Jabung Village Head and the Community Service Leader Heny Astutik, followed by a presentation of the activity evaluation results by Duhita Dyah Apsari, and the acceptance of cadres' certificates and small gifts to Jabung Village cadres.



FIGURE 9. Closing Ceremony

All the community service activities were very well received, and the cadres actively participated. This was reflected in the enthusiasm of the cadres every day, their active participation in questions and discussions with the community team, and the post-test results showed an improvement, increasing the average score from 57.8 to 85. At the same time, the increase in skills from the practicum of redemonstration as a peer educator, which was assessed using a health educator checklist compiled by the community service, and the assessment checklist has already been verified by lecturers from the Midwifery and Health Promotion program.

TABLE 1. Pre-test and Post-test Results

Knowledge Score	(Pre-Test) f (%)	(Post-Test) f (%)
Good (76-100)	3(10%)	26 (86,67%)
Average (56-75)	17 (56,67%)	4 (13,33%)
Low (<56)	10 (33,33%)	0 (0%)
Total	30(100%)	30 (100%)

Table 1 showed the increase of the percentage of good scores from 10% in the pre-test and 86,67% in the post-test, and the zero percentage of low scores in the post-test, which showed that the majority of cadres had improvement in their knowledge about women's reproductive health, pregnancy health, toddlers' health, and Stunting prevention.

DISCUSSION

Following the community service, it is evident that there was an increase in the knowledge of cadres. Before the pre-test, the score was 57.8, and it increased to 85 in the post-test. Secondly, there was an increase in skills from the practicum of redemonstration by educators, which was assessed using a health educator checklist compiled by the community service team, with an average score of 86 for all participants. Thirdly, there was an increase in the ability of cadres to process and cook local and herbal products into supplementary foods. Cadres also got some new knowledge about marketing strategies, product packaging, and marketing in the digital era.

Providing material before the knowledge assessment showed significant increases of cadres' knowledge about stunting and its prevention. Training-based knowledge enhancement for cadres can be achieved through various methods, including lectures, discussions, and practical exercises provided by health workers. Empowering cadres through lecture-based training has been proven to improve health cadre knowledge significantly (Mediani et al., 2020). Providing education and empowering cadres will have a positive impact on the community, especially mothers with toddlers, by encouraging them to have their children checked at the integrated health post (Posyandu). Behavior change begins in the cognitive domain (knowledge), meaning the subject must first know and understand. The stimulus, in the form of material or subject matter, generates an internal response in the form of an attitude toward the object they know. Finally, the stimulus, namely the object that is fully understood, will elicit a further response, namely action. Increased knowledge itself does not always lead to change, but there is a positive relationship between knowledge and changes in behavior (Nurhidayah et al., 2019). With our community service programs, the results have not only increased knowledge but also increased cadres' skills as educators in the hope cadres can help to share their knowledge about health education and Stunting prevention to the wider community, which is why we named them as "peer educator" which the helath education and infomations will be come from their own community member (cadres) to another community members in Jabung Village.

Stunting reflects a lack of food and nutritional intake, inadequate healthcare, an unhygienic environment, poor maternal nutrition, and inadequate feeding and care of infants and children by mothers, other family members, and the community during the most critical periods of growth and development. (Djuwarno et al., 2022). One cause of stunting in children is a lack of iron-rich foods, necessitating an increase in iron intake. Iron is necessary for oxidation-reduction reactions, aerobic metabolism, and oxygen transport in the blood. Inadequate iron intake leads to oxygen starvation in body tissues, and bone growth is hampered by reduced oxygen supply (Dewi & Nindya, 2017).

The moringa plant, also known as "Daun Kelor" and referred to as the "Miracle Tree," is rich in nutrients and offers numerous benefits. All parts of the moringa plant are edible, including the leaves. 100 g of fresh moringa leaves contain 6.7 g of protein and 0.7 g of iron (Djuwarno et al., 2022). In this community service program, several creative supplementary food recipes for children were taught to cadres, including moringa pudding (also known as kelor pudding) and moringa nuggets (also known as kelor nuggets). In addition, one of the traditional medicines that can help increase and improve poor appetite in children is curcuma, as it contains the active substance curcumin, which can enhance the

activity of digestive enzymes. The increase in children's appetite can be attributed to the curcumin content in curcuma, which, when administered at the maximum dose, can help maximize absorption in the digestive system of children. Visualized in the form of jelly, with the addition of some milk and sugar, so that children will enjoy the food more (Rukmaini et al., 2024). Temulawak is a traditional natural remedy that can increase and improve appetite in children. It contains essential oils containing carminatives. When these carminatives work and stimulate the digestive system, appetite is stimulated. (Kurniarum et al., 2016). Chocolate is a food that is very popular with many people, especially children. Furthermore, chocolate also functions as a sedative. When chocolate is combined with temulawak, the children will love the pudding (Puspitasari, 2020). All the food innovations by community service are vibrant in terms of nutrition, which can be introduced to children as an alternative to some junk foods, in the hope that better nutrition intake will prevent stunting.

The food innovations were later presented at the Posyandu in 3 Dusun, and showed that children and toddlers liked the food innovations, especially the top 3 favorite Pudding Chocolate Temulawak, Curcumin Jelly, and Moringa Nugget or Nugget Kelor. However, our recipes have not yet undergone the Palatability test and nutritional content test, which will be conducted in future programs.

The implementation challenges and the strength of our community service were our community programs which included multi-knowledge and training programs for cadres, such as health education, peer education, local food innovations, and digital marketing that will be useful to improve not only cadres' knowledge and skills in the health service field, but also to help cadres increase value of their village local products. For sustainability, we hope that cadres in Jabung continue to improve their knowledge and skill, whether about health topics and cadres empowerment, such as using local products for small businesses to increase family income.

We acknowledge that our community service still has many limitations and high potential bias because our programs did not include control groups. Additionally, the food innovation recipes still do not undergo palatability tests and nutritional content tests. The weaknesses of this year's community service will be improved in future programs.

CONCLUSION

This community service is intended to increase cadres' knowledge about health, reproductive, and stunting prevention, to increase cadres' skill as peer educators in Posyandu, to increase cadres' knowledge about marketing strategies in the digital era, and to teach cadres some innovation recipes based on Jabung local products, including milk and some everyday herbal products. Following the community service, it is evident that there was an increase in the knowledge of cadres, as indicated by the pre-test score of 57.8, which rose to 85 in the post-test. Secondly, there was an increase in the number of skills cadres as educators, which was assessed using a health educator checklist, with an average score of 86 for all participants. Thirdly, there was an increase in the ability of cadres to process and cook local and herbal foods into supplementary foods to prevent stunting, which have a sales value, thereby reducing stunting rates among toddlers in Jabung Village. Cadres also got new knowledge about marketing strategies, product packaging and marketing in the digital era.

ACKNOWLEDGMENTS

Thanks are given to the Director Of Malang State Health Polytechnic, Head of Research and Community Service Department, Head of the Midwifery Department, Head of Bachelor of Applied Midwifery Program in Malang region, Midwifery Lecturers, students of the Bachelor of Applied Midwifery Program in Malang region, Head of Jabung Village, Midwife head in Jabung Village and all participants who played roles in the smooth running of this community service activities..

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