

Prevention, Identification, and Management of Stunting through Health Education and Entrepreneurial Capacity Building in Argomulyo Village, Sleman, Yogyakarta

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Abstract Stunting is one of the world's most serious public health issues, with significant morbidity rates, especially in Indonesia. Low public awareness of stunting and low family income are two major causes discovered especially in Special District of Yogyakarta. This community service project was undertaken to address this issue. Following the completion of the situation analysis and problem identification, a community-based problem-solving strategy in the form of health and entrepreneurship education was developed. Three medical experts provided prenatal health education to pregnant women, followed by an ultrasound screening to detect any early anomalies related to stunting. For other members of the community, experienced entrepreneurs give entrepreneurial education, which was supported by workshops for them to immediately practice the material that had been presented. It was intended that the community's excitement would raise health awareness about stunting and the level of the local economy, allowing the stunting problem in this region to be ameliorated. It was found that the provision of health education programs had succeeded in increasing the level of community knowledge regarding stunting. Ultrasound examination found that all pregnant women in the area had normal pregnancies and fetal conditions. Community-based interventions through health education and increasing economic welfare based on tourism villages can be used to prevent stunting.

1. INTRODUCTION

Stunting is a linear growth disorder caused by chronic malnutrition or chronic or recurrent infectious diseases as indicated by a z-score for height for age less than -2 SD (De Onis & Branca, 2016). The impact caused by stunting is divided into two, namely short-term and long-term consequences. One short-term impact, among other things, is that children become more easily sick and can experience impaired cognitive, motor, and language development (Dewey & Begum, 2011). Long-term impacts include short stature, increased risk of obesity, decreased reproductive health, and intellectual decline (Reinhardt & Fanzo, 2014). Several conditions are known as factors. The risks of stunting include genetic factors, disease, nutritional

status, family income, mother's education, and limited health services (De Onis & Branca, 2016).

Stunting has a high morbidity rate in developing countries. In 2017, around 22.2% of toddlers or around 150.8 million of them worldwide were stunted. More than half of these cases were found in Asia, and a third in Africa. It is known that of the 83.6 million stunted children under five in Asia, the highest proportion came from South Asia (58.7%) and the least proportion from Central Asia (0.9%). The WHO data shows that Indonesia is among the third countries with the highest prevalence in the Southeast Asia region (World Health Organization, 2020). The latest national survey data shows that the prevalence of stunting

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in Indonesia is 24.4%. The Special Region of Yogyakarta Province itself has a stunting prevalence of 17.3% and especially Sleman Regency has a stunting prevalence of 16.2%. This figure is still higher than the national target set by the government, which is 14.0% in 2024 (Kementerian Kesehatan RI, 2022). The high stunting rate is caused by various factors, one of which is the economic factor.

Low family income is one of the factors reported to be related to the occurrence of stunting (Islam et al., 2022). In addition to the low regional minimum wage for the Special Region of Yogyakarta, the lack of community skills in entrepreneurship is also suspected to be a factor in the low economic welfare of families (Astuti, 2014). Increasing community skills for entrepreneurship by exploiting regional potential is necessary. Specifically at this community service location, Argomulyo Village is a tourist village that has great potential in its natural tourism. This village has become one of the favorite tourist destinations, especially for elementary to high school students who make study visits (Kelurahan Argomulyo, 2023). However, this potential has not been utilized by the residents of Argomulyo village in the absence of regional specialities offered to tourists.

Based on the description above, it can be seen that stunting is a health problem that is very important to pay attention to because it has high morbidity and mortality rates in Indonesia. One of the factors thought to be related to this condition is the economic condition of the family. This shows the need for education related to stunting to the public, especially pregnant women and mothers with children under five, and increasing entrepreneurial skills by utilizing regional potential.

2. METHOD

The community service activities were carried out by teaching staff and students at the Radiology Specialist Medical Education Program, Faculty of Medicine, Public Health, and Nursing, Gadjah Mada University, supported by paediatricians, obstetricians, the Yogyakarta Industry and Trade Service, and instant ginger industry entrepreneurs. These activities were carried out in two locations, namely Cangkringan Community Health Center and the Argomulyo Village Hall, Cangkringan District, Sleman Regency. The community service activities began with an analysis of the situation at the activity location by involving the village head and the head of the Puskesmas to identify the most important health problems in the community and the factors that were thought to be the most influential.

A problem-solving plan was then prepared by the teaching staff and students of the Radiology Specialist Medical Education Program, Faculty of Medicine, Public Health and Nursing, Gadjah Mada University, for further discussion with the village head and the head of the Puskesmas. The social approach was carried out to reach as many pregnant women as possible, mothers with toddlers, and people of productive age who had entrepreneurial potential by involving community leaders.

After completing the licensing and administration

process, the community service activities were carried out. The following are the activities:

1. Health education on prevention, identification, and early management of stunting for pregnant women and mothers with toddlers in the working area of the Cangkringan Health Center
2. Pregnancy ultrasound examination at the Cangkringan Health Center for prenatal stunting screening
3. Entrepreneurial education for residents of Argomulyo village in the form of ginger processing to become regional souvenirs

To discover the benefits of the above activities, we assessed the participants' level of knowledge before and after the health education through a quiz consisting of 10 questions (minimum score 0 and maximum score 10). We also reported the results of ultrasound examinations in categorical form in the form of normal and abnormal status.

3. RESULT AND DISCUSSION

The community service activities were carried out according to plan. The management of stunting by involving the community was carried out through outreach activities regarding the prevention, identification, and initial management of stunting on 26 November 2022 from 08.00 to 11.00 WIB at the Cangkringan Health Center. This health education activity was delivered by dr. Titi Pambudi Karuniawaty, M.Sc., SpA, who shared important information regarding the prevention, identification, and early management of stunting in infants and toddlers, dr. Sarrah Ayuandari, PhD., SpOG, who provided education regarding early identification of stunting that begins when the infant is in the womb and improving the quality of mother's nutrition, and dr. Naela Himayati Afifah, M.Sc., SpRad, who provided education on radiological identification of various diseases that cause stunting.

This activity was attended by 27 participants and received high enthusiasm from the community, as seen from the many questions asked to the resource persons during the discussion session. Through this activity, a collaborative commitment was formed between the Cangkringan Health Center and the Department of Radiology, Faculty of Medicine, Public Health, and Nursing, Gadjah Mada University, aiming to continue addressing the problem of stunting in Cangkringan District. This activity was expected to increase public knowledge regarding stunting, given that low knowledge is one of the independent factors that influence stunting. Nutrition education and counselling during pregnancy, along with nutritional support, will affect birth weight, so that it will also affect the growth of the child (Titaley et al., 2019). The level of participants' knowledge before and after being given health education in this activity was assessed through two quizzes.

Table 1 shows that after receiving health education, participants had a higher level of knowledge, as shown by a significant increase in median quiz scores (median = 4

to 9; $p < 0.001$). This also shows the benefit of the health education program that has been implemented. The benefits of a health education program to increase public knowledge regarding stunting have also been reported in [Tadale et al. \(2020\)](#) research in Palu, Central Sulawesi.

Table 1 . Quiz score before and after health education program

	Median (Min-Max)	p
Before Health Education	4 (1-9)	< 0.001
After Health Education	9 (6-10)	

The health education program implemented by the doctors also found that there was an increase in the knowledge level questionnaire score after being given the health education program ([Tadale et al., 2020](#)). Another health education program conducted by [Dewi et al. \(2021\)](#) in Surakarta, Central Java, also reported similar results. In the report, it was stated that after receiving health education, the community became more aware of the dangers of stunting, and there was an increase in efforts to prevent it independently ([Dewi et al., 2021](#)).

The activities at the Puskesmas (health center) continued with antenatal ultrasound examinations for pregnant women in the working area of the Cangkringan Health Center. As many as 24 pregnant women received free antenatal ultrasound examination services from specialist radiologists, obstetricians, and general practitioners studying radiology specialists. This examination was one of the most anticipated activities for the participants because of the limited ultrasound examination services at the Cangkringan Health Center [Figure 1](#).



Figure 1 . Health education and pregnancy ultrasound examination

For this reason, this community service activity was an opportunity for pregnant women to be able to find out the health condition of their fetus using a tool that is still "sophisticated" from their point of view. All the pregnant women registered for the ultrasound examination

were successfully examined, and they also received brief education regarding the results of the examinations that had been carried out. All of the pregnant women who were examined were found that they had normal pregnancies and fetal conditions, so they did not require follow-up care at the hospital or obstetrician.

The activity aimed to enhance entrepreneurial skills was carried out by providing entrepreneurial education and workshops on making instant ginger [Figure 2](#), which was processed until it was ready for sale. The first material was delivered by dr. Torana Kurniawan, Sp.OnkRad, who explained material on the benefits of ginger for health, so that the participants could use this information to advertise their powdered ginger products. The second material was delivered by the Department of Industry and Trade, which shared information related to business licensing, ranging from small to large scale, because it was considered that the ginger powder industry had great potential for Argomulyo Village as a tourist village. The last activity was a ginger powder-making workshop which was led directly by two powdered ginger entrepreneurs who have been in the industry for many years. Both directly supervised the workshop participants when they were practicing making of powdered ginger making, so that corrections and suggestions could be given directly to the participants. It was hoped that this activity could start a ginger powder industry in Argomulyo Village to support its position as a tourism village. It is important to note that the ginger used comes from a family of medicinal plants which was previously initiated by the Department of Radiology, Faculty of Medicine, Public Health and Nursing, Gadjah Mada University.

The limitation of this community service activity was that there was no evaluation of the participants' knowledge, which could have been carried out immediately after the health and entrepreneurial education was provided. As a result, the effect of the activity could not be discovered. However, periodic evaluations to be done every three months had been planned, especially by monitoring the incidence of stunting and the number of ginger powder industries created.



Figure 2 . Entrepreneurial education and workshops on making instant ginger

4. CONCLUSION

Stunting is a public health problem with a high morbidity rate. Community holds critical roles in reducing the occurrences and impacts of it. This study confirmed that the community-based interventions through health education and increasing economic welfare based on tourism villages are able to overcome these conditions in Cangkringan District. Community awareness is the fundamental supporting key factor, which it can be achieved through education. The program needs to be sustained. A strong commitment with local authorities in controlling and monitoring the program's sustainability is the next supporting factor.

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CONFLICT OF INTERESTS

There is no conflict of interest regarding this publication. This manuscript is our original work that has not been published elsewhere nor is being considered in other journal publications. The authors confirm that the manuscript has been read and approved by all named authors, and all contributors have been listed. All authors have been notified, and they have approved of the corresponding author as the only contact regarding the manuscript's submission, revision, and approval processes.

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