

## Education Media about Stunting Prevention on Adolescents in Islamic Boarding Schools

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### Abstract

Education on stunting prevention for adolescents should align with the prevailing high prevalence of stunting among children under five years old in Indonesia. This study aims to assess the impact of such education on the knowledge and attitudes of adolescents attending Islamic boarding schools in Kendal Regency. The study employs a quasi-experimental pre-post test design with a control group. The educational materials consist of animated videos and booklets. The participants, adolescents from Islamic boarding schools, were divided into the intervention group (n=63) and the control group (n=63). The data analysis involved independent sample t-tests, multiple linear regression, and gain scores. The findings indicate a positive influence of educating adolescents through animated videos and booklets on their knowledge ( $p=0.000$ ) and attitudes ( $p=0.000$ ) regarding stunting prevention. Notably, the average gain score for knowledge increased by 63.99%, and for attitudes by 58.49%. Consequently, the provision of education using these materials has the potential to enhance the knowledge and attitudes of adolescents in Islamic boarding schools. Hence, consistent and regular educational efforts are imperative for addressing stunting issues from an early stage.

**Keywords:** *adolescent, education, media, stunting-prevention*

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### Introduction

The welfare of nations and states in today's globalized era hinges on the presence of high-quality human resources (Wapresri, 2018). This quality is directly tied to the well-being of children during their first 1,000 days of life, shaping their nutritional status (Ministry of Health, 2020). Indonesia

grapples with chronic nutritional issues, particularly stunting among children (Hidayat et al., 2019), which refers to persistent growth failure in children under five years old (Ministry of Health, 2020). The government is addressing this issue through a stunting prevention program aimed at reducing stunting rates to 14% by 2024 (Wapresri, 2018). As of 2021, stunting prevalence in Indonesia stood at 24.4%, projected to decrease to 21.6% by 2022 (Ministry of Health, 2023).

The high prevalence of stunting underscores the urgency of accelerating stunting prevention through a national behavior change campaign facilitated by health promotion efforts (Wapresri, 2018). Health promotion seeks to modify people's health behaviors, enabling them to proactively uphold their well-being in daily life (Notoatmodjo, 2010). To this end, health education plays a pivotal role. Research reveals that educating adolescents can enhance their knowledge (Rusilanti & Riska, 2021), mirroring the impact of health and nutrition education on reducing stunting (Elisaria et al., 2021).

Health promotion efforts to reduce stunting rates in Indonesia are currently pursued through three main targets: primary, secondary, and tertiary. Among these, young women or female students represent a secondary target group with the potential to influence the birth of, prevent, and address stunting issues in their future children (Ministry of Health, 2018). The decision to focus on adolescents for educating about stunting prevention is rooted in the understanding that adolescence is a developmental phase characterized by self-identity exploration and psychological instability. This makes the educational interventions introduced during this phase more likely to embed as habitual behaviors, supporting long-term stunting reduction initiatives from an early age (Syafuruddin et al., 2019). The health practices established during adolescence significantly impact an individual's lifestyle and well-being in adulthood (Merino-Godoy et al., 2022). This notion aligns with the idea that young individuals have the agency to cultivate positive health habits, thereby averting health issues like stunting later in life (Eghbal et al., 2023).

The present study specifically aimed to provide stunting prevention education to female students within Islamic boarding schools. This sample selection was motivated by the greater prevalence of Islamic boarding schools, compared to both public and private institutions, at the high school

level in Kendal Regency (Central of Statistics Agency, 2020; Ministry of Religion, 2022). The choice of female students is further informed by their potential role in shaping the future by influencing the prevention and mitigation of stunting issues (Ministry of Health, 2018).

The study's educational content focuses on preventing stunting among female students. It has been tailored to address potential health issues in Islamic boarding schools that might lead to stunting. Initial findings from interviews and observations in a Kendal Regency Islamic boarding school highlighted health-related concerns that could contribute to future stunting. As a result, there is a recognized need for proactive health promotion and prevention efforts. This educational approach encompasses various aspects, including explaining stunting, stressing the significance of iron supplementation, promoting proper menstrual hygiene and reproductive care, discouraging early marriage, advocating for balanced nutrition, emphasizing hand hygiene and hygienic toilet practices, and underlining the importance of timely immunization. Research underscores that female students are particularly susceptible to anemia, a key contributor to future stunting (Hamidiyah, 2020; Ummah & Ratibi, 2021; Utami et al., 2022).

To counter stunting and anemia risks, the educational strategy primarily focuses on consistent iron tablet consumption. Additionally, research indicates that female students often lack proper personal hygiene habits, including menstrual care, handwashing, and sanitation practices (Maharani & Andriyani, 2018). The educational intervention also addresses the adverse effects of early marriages and incomplete immunization. Early marriages, particularly before 18 years of age, are linked to higher risks of premature birth, low birth weight, and eventual stunting (Ministry of Women Empowerment and Child Protection, 2021). This approach finds resonance in studies from Bangladesh, which highlight that adolescent mothers, due to early marriage, are at heightened risk of having undernourished or stunted children (Haque et al., 2022). Similarly, research in Africa suggests that factors like child's age, vaccination status, mother's age, maternal obesity, and area of residence play pivotal roles in reducing stunting and obesity risks in children (Zemene et al., 2023).

Education regarding effective stunting prevention plays a vital role in raising awareness among adolescents, particularly those aspiring to become mothers. This education focuses on maternal and child health during a crucial life stage and holds the potential to disrupt the cycle of stunting issues (Resmiati et al., 2021). Similarly, addressing the stunting and malnutrition challenge in Ethiopia, Getahun et al. (2023) emphasize the positive impact of nutrition education delivered by educators and healthcare providers.

Success in delivering nutrition education to female students at Islamic boarding schools hinges on the choice of health promotion media. The manner in which messages are conveyed significantly influences engagement and comprehension, thereby fostering positive behavioral changes (Notoatmodjo, 2010). Given the rapidly evolving landscape, it is imperative to adapt health education methodologies and media for female students within Islamic boarding schools (Kasjono & Suryani, 2020). This adaptation aligns with the current trend of integrating digital-based technology into the learning system of Islamic boarding schools, as noted by Munifah & Purwaningrum (2022). However, it's worth mentioning that the integration of such technologies is not yet widespread in Indonesian Islamic boarding schools (Ibda et al., 2023).

Based on preliminary research conducted in Islamic boarding schools in Kendal Regency, various methods and media for health promotion among adolescents were identified. These include traditional counseling, animated videos, and booklets. Notably, the conventional teaching approach in Islamic boarding schools, centered around the teacher, limits students' ability to seek information from media sources (Apdoludin & Martinisyamin, 2022). Animated videos and booklets are considered effective and efficient tools for information dissemination (Surjono, 2017; Wibawanto, 2017). Existing studies highlight the positive impact of animated education on students' knowledge, skills, and attitudes (Budakoğlu et al., 2023), underscoring students' preference for visual learning as it aids in information absorption compared to traditional lectures (Nyirahabimana et al., 2023).

Videos, being a medium that merges audio and visual elements, often evoke an entertaining appeal that can reshape individual and societal attitudes (Jatmika et al., 2019). This viewpoint is

corroborated by research demonstrating that multimedia can enhance high school students' comprehension by 68.6% (Hamdi et al., 2013).

Currently, numerous research studies focus on childhood stunting; however, research specifically addressing stunting prevention remains limited, particularly in Indonesia. This study distinguishes itself by targeting female boarding school students as participants, considering their constrained access to gadgets and social media. Additionally, the study employs animation to captivate female students' interest in educational content. Thus, there is a pressing need to introduce stunting prevention education to young female students. This initiative anticipates enhancing their knowledge and cultivating positive attitudes towards health, thereby contributing to the reduction of stunting's prevalence in Indonesia. The educational approach in this research combines counseling techniques with visual media, aiming to effectively amplify awareness and attitudes related to stunting prevention among female students. This approach aligns with findings that melding lecture-style instruction with media yields superior learning outcomes in terms of knowledge and attitudes compared to solely media-based methods (Azhari & Fayasari, 2020). Against this backdrop, the study endeavors to assess the impact of stunting prevention education on the knowledge and attitudes of adolescents within Islamic boarding schools in Kendal Regency.

## **Method**

### *Design*

In this study, a quasi-experimental pre-post test design with a control group was employed. The study examines the influence of education on stunting prevention, using variables such as the independent variable (education's impact), dependent variables (knowledge and attitudes), and confounding variables (peer support, parental and teacher support, and information accessibility).

### *Participants*

Participants were selected through in-person visits to two Islamic boarding schools by the researchers. Data collection took place in common spaces like the mosque, hall, or classroom. Informed consent forms were distributed, outlining the study's purpose, procedures, participant rights, and data confidentiality. The target population comprised adolescents pursuing senior high

school education in Islamic boarding schools. The sample, selected purposively, consisted of 126 female students aged 15-19 years, residing and studying in Islamic boarding schools within Kendal Regency. The sample was non-randomly divided into two groups: an intervention group (n=63) receiving counseling and educational media (animated videos and booklets) on stunting prevention, and a control group (n=63) receiving only counseling on the same topic.

### *Instruments*

The instrument employed a validated and reliable questionnaire, along with animated videos and booklets. The validity of the instrument was assessed through the biserial point correlation test for knowledge, while other variables such as attitudes, peer support, parent and teacher support, and access to information were tested using the Pearson product-moment test. The reliability of the instrument was evaluated using Cronbach's alpha test across five variables.

### *Procedure*

The research process was divided into three main phases: pre-intervention assessment (pre-test), delivering stunting prevention education three times over an 8-day period, and post-intervention assessment (post-test). Education on stunting prevention was provided through direct counseling sessions lasting 15 minutes, utilizing the lecture method. Additionally, the intervention group received a 6-minute animated video and booklet covering various aspects of stunting prevention. The education covered topics such as stunting explanation, the significance of iron supplementation, menstrual hygiene, averting early marriage, balanced nutrition, proper hand hygiene, hygienic toilet usage, and timely immunization.

### *Data Analysis*

Data analysis was conducted using IBM SPSS Statistics 26 software. Firstly, the normality and homogeneity of all variables were assessed. Subsequently, descriptive analysis was carried out by computing the mean values for each group. Following this, independent sample t-tests were performed, alongside multiple linear regression to control for confounding variables. The effectiveness of the intervention was assessed through gain score analysis.

### Ethical Clearance

This research obtained ethical approval from multiple bodies, including the Health Research Ethics Committee at Diponegoro University's Faculty of Public Health (Approval Number: 002/EA/KEPK-FKM/2023), Baperlitbang Kendal Regency, and the relevant Islamic boarding school location.

### Result

The study's findings showcase the impact of educating adolescents at Islamic boarding schools about stunting prevention and its effectiveness. This research examined five key variables: knowledge, attitudes, peer support, parental and teacher support, and access to information. The focus was on adolescents in Islamic boarding schools within Kendal Regency. The analysis categorized the results into two groups: the intervention group, which received both educational content and media related to stunting prevention, and the control group, which solely received educational information without media. These measurements, namely pretest and posttest, helped assess the outcomes.

Table 1

*The results of the analysis of the difference in scores between the intervention group and the control group*

Variable	n	Mean $\pm$ s.b.	Mean Difference (IK95%)	P
<b>Knowledge</b>				
Intervention	63	19,14 $\pm$ 1,9	3,9 (3,2-4,7)	0,000
Control	63	15,21 $\pm$ 2,3		
<b>Attitude</b>				
Intervention	63	95,94 $\pm$ 5,3	4,9 (2,9-6,8)	0,000
Control	63	91,06 $\pm$ 5,6		
<b>Peer Support</b>				
Intervention	63	58,03 $\pm$ 6,1	1,6 (0,3-3,5)	0,107
Control	63	59,60 $\pm$ 4,7		
<b>Parental and Teacher Support</b>				
Intervention	63	64,38 $\pm$ 5,5	11,0 (9,2-12,9)	0,000
Control	63	53,33 $\pm$ 5,0		
<b>Ability to Access Information</b>				
Intervention	63	58,40 $\pm$ 6,7	4,0 (1,7-6,5)	0,001
Control	63	54,35 $\pm$ 6,9		

Referring to Table 1, the distribution of results from the unpaired t-test analysis is evident. This analysis employed the independent-sample t-test on post-test data collected from both the intervention group and the control group. The findings of this analysis lead to the conclusion that among the variables examined – knowledge, attitudes, parental and teacher support, and information accessibility – there exists a noteworthy discrepancy in scores between the intervention and control groups ( $p\text{-value} < 0.05$ ). However, for one variable, namely peer support, the scores between the intervention and control groups do not display a significant difference ( $p\text{-value} > 0.05$ ).

Table 2

*The results of the analysis of the effect of providing education on knowledge and attitudes between the intervention group and the control group*

Variable		Mean	Difference (IK95%)	P
<b>Knowledge</b>				
Unadjusted <sup>a</sup>	Intervention	19,14	3,9 (3,2-4,7)	0,000
	Control	15,21		
Adjusted <sup>b</sup>	Intervention	19,14	3,9 (3,2-4,7)	0,000
	Control	15,21		
<b>Attitude</b>				
Unadjusted <sup>a</sup>	Intervention	95,94	4,9 (2,9-6,8)	0,000
	Control	91,06		
Adjusted <sup>b</sup>	Intervention	95,94	4,9 (2,9-6,8)	0,000
	Post-test Control	91,06		

a. Covariates appearing in the model are evaluated at the following values: Parental and Teacher Support = 58.86, Ability to Access Information = 56.37.

Based on Table 2, you can observe the outcome distribution of the multivariate analysis conducted using the multiple linear regression test on two distinct groups: the intervention group and the control group. In this study, the unadjusted value originates from the independent-sample t-test, while the adjusted value stems from... Upon analyzing these outcomes, a noteworthy observation emerges: the p-value for knowledge and attitude concerning stunting prevention is 0.000. This suggests a significant impact of education regarding stunting prevention on the knowledge and attitudes of adolescents in Islamic boarding schools. This impact holds true even



after accounting for potential influencing factors such as parental and teacher support, as well as information accessibility.

Table 3

*The results of the analysis of the effectiveness of educational media on stunting prevention between the intervention group and the control group*

Measurement	Intervention Group		Control Group	
	%		%	
<b>Knowledge</b>				
Mean	63,99		29,80	
Minimum	17		13	
Maximum	92		73	
<b>Attitude</b>				
Mean	58,49		45,77	
Minimum	35		13	
Maximum	90		74	

Based on Table 3, the distribution of effectiveness test results using the gain score test in both the intervention and control groups is evident. The N-gain score calculations reveal that the Knowledge variable averages at 63.99% for the intervention group and 29.80% for the control group. Similarly, for the attitude variable, the intervention group averages at 58.49%, while the control group is at 45.77%. These findings suggest that providing education on stunting prevention through animated videos and booklets significantly enhances the Knowledge and attitudes of young girls. In contrast, conventional education methods, lacking media support, show comparatively lower effectiveness in knowledge enhancement and are ineffective in improving attitudes.

Table 4

*The results of content analysis*

Content	Intervention Group		Control Group	
	Knowledge	Attitude	Knowledge	Attitude
Stunting description	26,20	19,33	16,40	15,67
Consumption of TTD	21,83	19,60	6,17	15,80
Treatment of reproductive organs during menstruation	16,67	26,14	5,67	19,86
Prevention of early marriage	14,00	24,00	7,50	20,50

Referring to Table 4, it becomes evident that educational material concerning stunting prevention holds the greatest sway and captures the interest of adolescents in Islamic boarding schools. The educational content follows a sequence, encompassing an explanation of stunting, the usage of iron supplements, menstrual care, and the avoidance of early marriages. Likewise, the attitudinal content follows a sequence, covering menstrual hygiene, discouraging early marriage, iron supplement consumption, and stunting explanations. These findings suggest that the engagement of adolescents from Islamic boarding schools in stunting prevention education yields distinct impacts on both their knowledge and attitudes.

## **Discussion**

Stunting is a serious condition that arises due to prolonged inadequate nutrition, leading to potential long-term health issues (Ministry of Communication and Information Technology, 2019). Children affected by stunting are more susceptible to non-communicable diseases in adulthood, including diabetes, hypertension, and cardiovascular ailments (Ministry of Villages, Development of Disadvantaged Regions, and Transmigration, 2018). Addressing stunting in Indonesia aligns with Sustainable Development Goals (SDGs), specifically the second goal of eliminating hunger and malnutrition. To achieve this, it's essential to focus on preventive and promotive measures to decrease stunting incidents (Ministry of Health, 2018). Lawrence Green suggests that altering individual behavior can be achieved through influencing predisposing factors (such as characteristics, knowledge, attitudes, beliefs, and perceptions), driving factors (like health worker, family, and peer attitudes), and enabling factors (availability of facilities and government policies) (Notoatmodjo, 2010).

This study aims to investigate potential disparities in the impact of stunting prevention education on the knowledge and attitudes of female students in Kendal Regency. Furthermore, it delves into variations in the effects of this education on three contributing variables: peer support, parental and teacher support, and access to information among female students in Kendal Regency. The analysis focuses on post-intervention data, comparing those who received repeated counseling

and educational materials (animated videos and booklets) on stunting prevention with a control group that only received counseling.

Based on the researcher's analysis of two key variables – Knowledge and Attitude – through multiple linear regression, it becomes evident that no disparity exists in Knowledge and Attitude scores before and after accounting for confounding variables. These variables encompass parental and teacher support, as well as accessibility to information. These findings also affirm a noteworthy correlation between educational efforts in stunting prevention and the Knowledge and Attitudes of female students in Kendal Regency.

This correlation implies that greater exposure to stunting prevention education translates to improved Knowledge and Attitudes among female students, thus contributing to the reduction of stunting occurrences in Indonesia. This outcome echoes a study in Benda Baru Village, Pamulang District, South Tangerang City, where nutrition education led to heightened awareness about stunting prevention (Rusilanti & Riska, 2021). Moreover, it aligns with research emphasizing the effectiveness of health promotion and nutritional interventions in tackling stunting (Vilcins et al., 2018).

An investigation into content preferences revealed that adolescents' interest in stunting prevention information hinges on delivery methods and media. Notably, groups exposed to animated videos and booklets exhibited a more substantial uptick in average interest in Knowledge and Attitudes compared to non-media recipients.

Furthermore, the analysis divulges insights regarding educational content suitable for adolescents, particularly those in Islamic boarding schools. This content encompasses comprehensive explanations of stunting, encompassing its definition, short and long-term impacts, causative factors, and preventative measures from an early age. Additionally, the content extends to guidelines for consuming iron supplements, proper reproductive organ care during menstruation, and discouraging early marriage. This encompasses aspects like ideal marriage age, marital readiness for both genders, and the consequences of early marriage on adolescents.

Based on the findings, it can be concluded that educating female students about stunting prevention through counseling, animated video media, and booklet media is notably more effective in enhancing their understanding and attitudes toward stunting prevention, when compared to solely providing counseling-based education without media support. The study's analysis of the effectiveness of stunting prevention education among adolescents at Islamic boarding schools indicates that health promotion strategies utilizing counseling along with media aids such as animated videos and booklets are more well-received and comprehensible to young women.

These media-enriched health promotion methods were found to significantly enhance Knowledge and attitudes related to stunting prevention among female students, in contrast to solely employing counseling without media, which was shown to be ineffective in cultivating awareness and understanding of stunting prevention among adolescents at Islamic boarding schools.

The study demonstrates that health promotion initiatives aimed at educating female students or young women about stunting prevention can substantially elevate their understanding and attitudes toward better health practices. This, in turn, leads to the adoption of positive behavioral habits and increased awareness about crucial health aspects, such as the use of additional blood tablets, proper care of reproductive organs during menstruation, and the avoidance of early marriage. These findings resonate with existing research, as evidenced by Marni et al. (2021), indicating that education plays a pivotal role in enhancing public awareness and knowledge regarding stunting prevention.

As a result, there arises a need for equitable dissemination of health promotion efforts in the domains of nutrition and healthcare, to expedite stunting prevention endeavors in Indonesia. These findings also align with research conducted in Tanzania by Elisaria et al. (2021), underscoring the substantial impact of health and nutrition education, delivered through health promotion, on health-related behavior and nutritional practices, thereby contributing to the reduction of stunting prevalence.

Promoting health to prevent stunting among female students and young women in school environments, particularly in Islamic boarding schools, can be effectively conducted by health workers based at the nearest health center. This can be achieved through counseling sessions complemented by engaging media, such as animated videos and informative booklets. This approach is supported by the idea that providing adequate nutrition education by both teachers and health professionals plays a constructive role in addressing stunting and malnourishment issues, as seen in Ethiopia (Getahun et al., 2023).

The utilization of these media resources serves the purpose of captivating the attention of female students and young women, who are increasingly drawn to the digital realm. Dispensing information through visuals and audio has been proven to be more impactful in information retention. This approach aligns with recent research illustrating that students are more inclined to and receptive of educational content presented in animated formats, which facilitate better understanding compared to traditional lectures (Nyirahabimana et al., 2023).

Incorporating alternative media like booklets, incorporating a blend of images and text, which can be revisited, has also exhibited positive effects on augmenting the knowledge and attitudes of female students within Islamic boarding schools. This approach resonates with research conducted in South Sumatra, where booklet-based interventions effectively enhanced adolescents' understanding and attitudes regarding stunting prevention, especially in terms of nutritional aspects (Sriwiyanti et al., 2022).

Health promotion initiatives aimed at preventing stunting among female students and young women residing in dormitories, such as schools and Islamic boarding schools, can also be orchestrated by educators and teaching staff. Given the teacher's proximity to these students, it becomes pivotal to organize awareness campaigns and training sessions centered around health behaviors. These endeavors contribute to the broader objective of accelerating stunting prevention within Islamic boarding schools.

The comprehensive approach to stunting prevention among female students and young women encompasses essential practices such as weekly iron supplement intake, maintaining reproductive health during menstruation, discouraging early marriages, adhering to a balanced diet, practicing hand and environmental hygiene (including ensuring access to clean latrines), and emphasizing complete immunization.

The findings of this study align with previous research conducted in various locations. For instance, in East Jakarta, Azhari & Fayasari (2020) discovered that combining the lecture method with media resulted in improved learning outcomes, including increased knowledge and more positive attitudes, compared to not using media. Similarly, in Padang, Hamdi et al. (2013) found that interactive multimedia enhanced high school students' understanding by 68.6%. Likewise, research in Batu Sopang by Syahdiani et al. (2016) indicated that media usage improved learning outcomes and boosted critical thinking skills, with a notable average gain score increase of 0.8.

Furthermore, studies from Kulon Progo (Kasjono & Suryani, 2020) and beyond (Resmiati et al., 2021) underscore the efficacy of media, particularly applications, in fostering positive behaviors and knowledge acquisition. This underscores the potential for health promotion strategies that employ counseling or lectures along with media to yield better results, especially among female students. These strategies are particularly vital in addressing stunting and related factors such as balanced nutrition and anemia.

It's important to note that this study employed quantitative methods and a closed questionnaire to focus on adolescent stunting prevention education. However, certain limitations exist. The scope concentrated solely on knowledge and attitudes, the measurements relied solely on researcher-distributed questionnaire scores, and the study sample was restricted to Islamic boarding school students in Kendal Regency. To broaden the applicability of these findings, future research could expand the sample to encompass all adolescents in Kendal Regency, including future brides, pregnant women, and young mothers.

## Conclusion

Providing education on stunting prevention significantly improved adolescents' knowledge and attitudes. Thus, utilizing educational media like animated videos and booklets for health promotion is both acceptable and comprehensible for adolescents, aiding in early-age stunting prevention. Media content covering stunting explanations, iron supplement consumption, menstrual health, and preventing early marriages can effectively contribute to stunting prevention in adolescents. This study serves as a basis for future research, aiming to enhance the swift, accessible, cost-effective, and targeted delivery of health-related information.

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