



Effectiveness of Media-Based Health Education on Stunting Prevention in Adolescents: A Systematic Review

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Abstract

Efforts to promote stunting prevention from an early age can be carried out by media that is effective at targeting youth, where youth activities cannot be separated from the digital world. This systematic review uses a scoping review approach and aims to identify media as an intervention in efforts to prevent stunting in adolescents. Article searches were conducted through Google Scholar, ScienceDirect, and PubMed published in 2018 to 2022 with criteria of full text, open access and keywords such as 'media AND prevention AND stunting AND effective AND teen' found 16,508 articles which were then obtained based on the inclusion criteria 8 selected papers. This research describes 5 media interventions for adolescent stunting prevention, including audiovisual; Android applications, social media, leaflets, and booklets. Social media is the most influential media in preventing stunting in adolescents with an increase in the pre-test and post-test difference by TikTok (36.75%), Instagram (22.29%), Twitter (20.25%), Youtube (16.66%), and Facebook (12.61%). Audiovisual videos accompanied by explanations are the second medium that is effectively used, marked by an increase in knowledge from 50.9% to 76.6% compared to the use of videos without reasons. The media interventions have proven effective in increasing adolescents understanding of stunting prevention. Information dissemination to the public, especially youth, is expected to utilize digital media to increase adolescents' knowledge of stunting prevention which is more effective and efficient.

Keywords: adolescent; education; social-media; stunting-prevention

INTRODUCTION

A country must have healthy, intelligent, creative, and productive human resources (Adji et al., 2019). Indonesia is currently facing chronic nutritional problems related to the high prevalence of stunting in toddlers (Hidayat et al., 2019). Stunting is a condition of failure to thrive in a child due to chronic malnutrition over a long period as well as psychosocial stimulation and repeated exposure to infections, especially in the first 1,000 days of life, starting from the age of the fetus until the child is two years old

(Vice President of the Republic of Indonesia, 2018). Stunting that occurs in children will have a negatively impact both in the short and long term (Data and Information Center, 2018). Stunting management in Indonesia has been carried out consistently since 2012 reduce the stunting rate to 14% by 2024 (Vice President of the Republic of Indonesia, 2018). However, the prevalence of stunting in Indonesia in 2021 will be 24.4% (Ministry of Health, 2021).

Stunting is a health problem that needs to be addressed immediately to support the success of national development. Therefore, efforts to

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prevent stunting need to be in various aspects. The national behavior change campaign is one aspect of measures to prevent stunting in Indonesia (Vice President of the Republic of Indonesia, 2018). Health campaigns with counseling can effectively increase mothers' knowledge about parenting and fulfilling child nutrition in tackling stunting (Nurhayati et al., 2020). Research in West Nusa Tenggara through social campaigns with audiovisual media has proven to be effective in increasing the knowledge of mothers and cadres in preventing stunting which is marked with a p-value of 0.000 (Maulidiyanti and Muslim, 2023). Research in Tanzania proves that a national communication campaign using radio and television media can reduce stunting in children (Moffat et al., 2022).

One of the targets in efforts to prevent stunting in children is young women. Young women are a group that has the potential to give birth to, control, and be able to alleviate stunting in the future (Ministry of Health, 2018). Adolescent girls have the potential to have a high risk of experiencing anemia which is an essential factor in stunting in the next generation (Utami et al., 2022). This condition is evidenced by a study in Buleleng which stated that adolescents experienced mild anemia (77.7%), moderate anemia (20.2%), and severe anemia (2.1%) which correlated with stunting (Tarini et al., 2020). Research in Surakarta states that anemia in pregnant women can disrupt fetal growth and increase the risk of stunting in children when they are born (Tampy et al., 2020). Another study stated that most stunted children were born to mothers with a history of anemia as teenagers and experienced anemia during pregnancy (Salma and Alifariki, 2021).

Efforts to prevent stunting in adolescents can be carried out by providing health education including the consumption of blood-boosting tablets (TTD), care for reproductive organs during menstruation, prevention of young marriage, consumption of balanced nutrition, washing hands with soap, using healthy latrines, and carrying out these activities completely and on time (Directorate General of Public Information and Communications, 2020). Stunting can also be prevented by fulfilling good nutrition during pregnancy until the child is two years old (Kadir, 2021). In addition to fulfilling food needs, the condition of households with unimproved latrines and consuming

untreated drinking water can increase the risk of stunting in children (Beal et al., 2018). Therefore, research in Ethiopia states that implementing clean and healthy living behaviors, including access to clean water, such as washing hands with soap and using healthy latrines, can reduce the risk of infectious diseases that can cause stunting (Kwami et al., 2019).

The use of media in health education to prevent adolescent stunting is used as a forum for information combined with technological developments in the current era of globalization. Media use in the learning process is essential because the media can clarify the messages and information conveyed (Hardinsyah and Supriasa, 2017). Health promotion media that can be used for stunting prevention is currently divided into digital media and print media, where the use of the media is adjusted to the target conditions. Digital media can be in the form of videos, movies, websites, and Android-based applications, as well as social media, while print media can be in the form of leaflets, booklets, posters, magazines, comics, and books (Jatmika et al., 2019). Research about the use of digital learning media significantly increases students' understanding of school material compared to those without learning media (Yusuf, 2021). Research in Purbalingga states that students' motivation and enthusiasm for learning increase when teachers use learning media (Puspitarini and Hanif, 2019). Research in Padang shows that the use of social media Instagram has the impact of increasing high school adolescents' knowledge about balanced nutrition (Rusdi et al., 2021). Research in Kulon Progo states that using the Gasing application with high school students can increase stunting prevention behavior higher than giving leaflets (Kasjono and Suryani, 2020). This research aligns with nutrition research on adolescents which shows that the EduStunting Android application can increase adolescents' knowledge and attitudes toward stunting and nutrition-related factors (Resmiati et al., 2021).

Currently, there are quite a lot of topics regarding stunting, especially the handling of stunted children, which is marked by the high number of stunting incidents in the world, so prevention is needed in the form of providing health education through digital media, especially targeting teenagers who are currently still limited in number. Research on the effectiveness of media-based health education in preventing

adolescent stunting needs to be conducted to determine appropriate and effective interventions. Therefore, this systematic review aims to identify the effective use of health education media in preventing adolescent stunting.

MATERIALS AND METHOD

The method used in this study is a systematic review with a scoping review approach following PRISMA guidelines 2020 (Page et al., 2021). Stages including: 1) Determine the research topic, namely health education media, that effectively prevents adolescent stunting; 2) Identifying the problem statement follows the PICOS guidelines (Table 1) (Methley et al., 2014); 3) Determine the keywords used: media AND prevention AND stunting AND effective AND teen; 4) Collecting sourced articles from Google Scholar, ScienceDirect, and PubMed. Based on search results in search engines using predetermined keywords, 16,508 articles were obtained; 5) Determine the criteria that are divided into inclusion and exclusion (Table 2). Based on the researchers' selection process, 8 articles were obtained that were suitable and used in this study. Selected papers in this study were analyzed in tabular form, containing information including article title, author, year of publication, research design, research sample

and location, research instruments and media, and results of research interventions. Narration is used by researchers in displaying research results and discussion by providing a summary, differences, and similarities in each article used. 6) Determine of PRISMA Flowchart (Figure 1).

RESULTS AND DISCUSSION

The articles that have been collected are identified and filtered so that eight articles are obtained, which are then analyzed. Based on the selected articles, it is known that several intervention media for preventing stunting target teenagers, namely audiovisual, Android applications, social media, leaflets, and booklets. The results of the analysis of the eight selected articles used regarding the effectiveness of media use in efforts to prevent stunting in adolescents can be seen in Table 3. Based on the eight articles that have been analyzed, it can be seen that the use of media has a practical and positive impact in increasing adolescents' knowledge, attitudes, and behaviors to prevent stunting from an early age.

Audiovisual

Audiovisual media is a medium that can stimulate the senses of hearing and vision in adolescents contributing to changes in adolescent health behavior, especially behavior in preventing

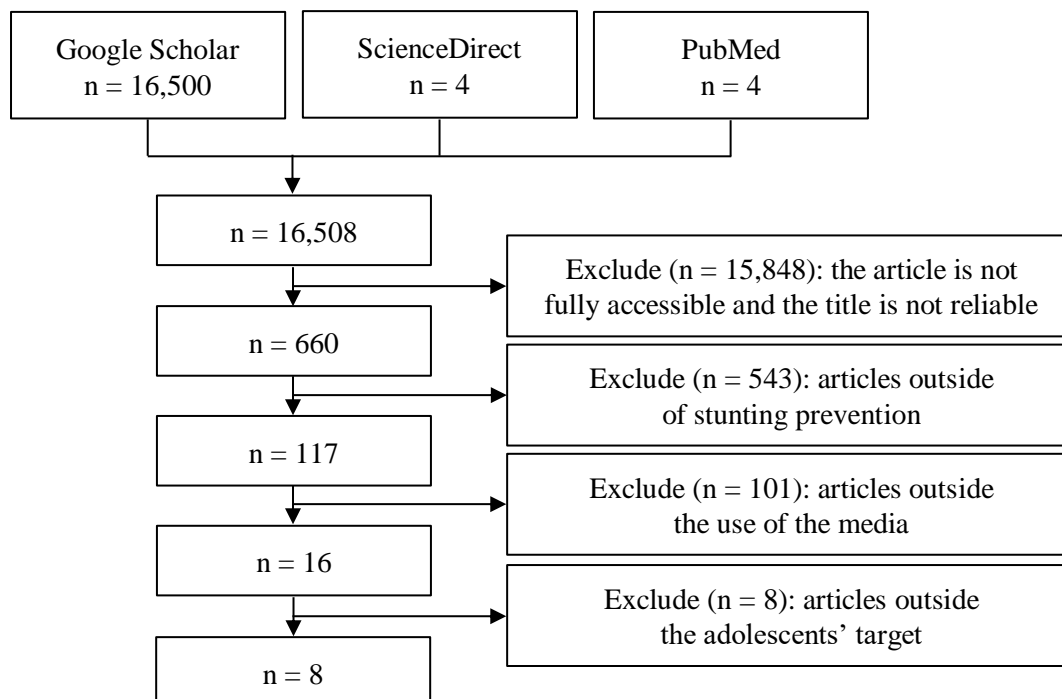


Figure 1. Flowchart of a systematic review with a selection process using PRISMA

stunting (Sunaeni et al., 2022). The use of video as a learning medium, especially in increasing adolescents' understanding of health, is proven to help adolescents understand and memorize information provided over a long period because humans have limited memory (Siswati et al., 2022).

Based on the eight articles that have been analyzed, three pieces utilize audiovisual media in providing education about stunting with lengths of intervention ranging from one day, three months, and one year. Content used in stunting prevention includes the first 1000 days of life, promoting of stunting prevention behavior, adolescent health, and fulfilling teenage nutrition. Based on the analysis it can be seen that the use of audiovisuals has an impact on increasing the knowledge and attitudes of adolescents toward preventing stunting. The analyzed articles have weaknesses, namely limitations in accessing the media, which can only be accessed during research. The differences between the three papers were in the duration of the intervention, media presentation, and media sources, where two articles were sourced privately, and one piece was not mentioned. The advantages of audiovisuals include that the content is easier to understand and can encourage changes in the target's attitude towards healthy behavior. At the same time, the weaknesses require equipment and the ability to produce and use it (Jatmika et al., 2019).

Android application

Android-based media is a technology used via smartphones, with or without an internet network. The use of educational media with Android applications is considered effective in increasing the knowledge and attitudes of adolescents because, in the current millennial era,

it is supported by data that states that 53% of Indonesia's population who are teenagers tend to be inseparable from smartphones and the internet. Research conducted in West Sumatra in 2021 utilized an Android application called EduStunting, wherein users could access various information related to stunting prevention, especially in adolescents. This Android-based application tends to be new in health promotion media, especially in preventing stunting. Therefore this application still needs a lot of development to achieve the expected goals (Resmiati et al., 2021).

This research is in line with the study conducted in Sokaraja in 2022 by utilizing an Android application called the Gemas, where this application was made as one of the breakthroughs in using health promotion media to prevent adolescent stunting. This application can affect the memory and vision of adolescents in the short term, making it easier for them to understand the information provided, in this case, information regarding stunting prevention. The use of this Android-based application also has various advantages for its users, including that this application can be opened and used by users anytime and anywhere and this application does not require an internet connection, so it is not a burden for users to access the information needed (Mulidah et al., 2022). Based on the two articles that utilize media applications, it can be seen that the media comes from confidential sources. The content used includes stunting, stunting prevention, balanced nutrition, and anemia, which positively impact the knowledge and attitudes of adolescents with a difference in the duration of the intervention of three days and three months.

Table 1. The problem statements

Parameter	Criteria
P (Population)	Adolescents (Junior and Senior High School)
I (Intervention)	Health promotion regarding stunting prevention
C (Comparison)	Intervention media or non-intervention control group
O (Outcome)	Knowledge, attitude, behavior
S (Study design)	Experiment studies

Table 2. Selected article criteria

Inclusion criteria	Exclusion criteria
Published in 2018 to 2022	Published before 2018 or after 2022
Full text and open access	Subscription models
Original article	

Social media

The role of the internet in the world of education, primarily through social media, has many benefits, including that users can access education easily, including in the process of promoting works such as promoting health education on platforms such as Instagram, Youtube, Twitter, TikTok, and Facebook (Jatmika et al., 2019). Based on two analyses that utilize social media, it can be seen that media originates from confidential sources with content that adopts information from the government. Social media use has proven to have a practical impact in increasing knowledge, attitudes, and behavior of adolescents in preventing stunting, which is carried out for four months (Yuseran et al., 2022). It is known that nowadays teenagers cannot be separated from using social media, where there are almost no meaningful restrictions on posting,

or sharing photos, articles, sounds, videos, links, or whatever they want. The effectiveness of social media, which can reach thousands or even millions of targets quickly can become the new prima donna for massively oriented health promoters (Jatmika et al., 2019). Another advantage of social media is that it can immediately reach targets, but if the information shared is terrible, it will destroy society.

Print media

The results of the analysis state that the two articles utilize print media in the form of leaflets and booklets. Based on the two articles that used brochures and pamphlets, it can be seen that the press comes from confidential sources containing health and nutrition for adolescents with a difference of three and six months of intervention. This condition shows that using booklet media is more effective in health

Table 3. Data and information extraction from the previous study

Author and Year	Title	Method	Media	Results
Kamba et al. (2019)	The effect of video on the change of attitude toward stunting prevention among children in State Senior High School 1 Topoyo, Central Mamuju	1.Design: Quasi-experiment 2.Subject: Adolescents 3.Total sample: 342 4.Variable: Attitude 5.Duration: One year 6.Frequency: Not mentioned 7.Source: Not mentioned 8.Content: The first 1000 days of life and stunting prevention 9.Placed: Mamuju Regency, West Sulawesi	Videos and videos with explanations	The effect of video in the experimental group (p-value = 0.000), differences in the use of videos and videos with explanations (p-value = 0.000), and no change in the control group (p-value = 0.713)
Resmiati et al. (2021)	The effectiveness of Android-based youth nutritional education applications for stunting prevention	1.Design: Quasi-experiment 2.Subject: Adolescents 3.Total sample: 30 4.Variable: Knowledge, attitude 5.Duration: 3 days 6.Frequency: Infinite 7.Source: Personal 8.Content: Stunting, balanced nutrition, anemia 9.Placed: West Sumatra	The EduStunting application	Utilization of the EduStunting application media has the effect of increasing youth's knowledge and attitudes towards stunting and factors related to stunting including balanced nutrition and anemia (p < 0.05)

Yuseran et al. (2022)	The effect of community nutrition education innovation based on social media marketing on knowledge, attitude, and behavior to prevent stunting	<ol style="list-style-type: none"> 1.Design: Quasi-experiment 2.Subject: Adolescents, pregnant mother, breastfeeding mother 3.Total sample: 89 4.Variable: Knowledge, attitude, behavior 5.Duration: 4 months 6.Frequency: Infinite 7.Source: Government 8.Content: Stunting (description, impact, risk factors, prevention) 9.Placed: Indonesia 	Social media	The use of social media has a significant effect on increasing knowledge, attitudes, and behavior related to the promotion of stunting prevention and control, marked by an increase in the average post-test index, which is higher than the pre-test
Mulidah et al. (2022)	The Gemas application toward knowledge and attitude in preventing stunting of teenagers	<ol style="list-style-type: none"> 1.Design: Experimental study 2.Subject: Adolescents 3.Total sample: 100 4.Variable: Knowledge, attitude 5.Duration: 3 months 6.Frequency: Infinite 7.Source: Personal 8.Content: Stunting prevention 9.Placed: Sokaraja 	The Gemas application	Utilization of the Gemas application media has a practical impact on increasing youth knowledge and attitudes related to stunting prevention (p = 0.00)
Sunaeni et al. (2022)	The effectiveness of audio-visual media in increasing knowledge about the first 1000 days of young women's lives	<ol style="list-style-type: none"> 1.Design: Quasi-experiment 2.Subject: Adolescents 3.Total sample: 46 4.Variable: Knowledge 5.Duration: One day 6.Frequency: One time 7.Source: Personal 8.Content: The first 1000 days of life 9.Placed: Sorong, Papua Barat 	Audiovisual	The use of audiovisual media in adolescents has a practical impact on increasing adolescent knowledge about the first 1000 days of life as an effort to prevent stunting (p = 0.001)
Siswati et al. (2022)	Improving adolescent knowledge and attitude toward the intergenerational cycle of undernutrition through audiovisual education: findings from RESEPIN study in Yogyakarta,	<ol style="list-style-type: none"> 1.Design: Quasi-experiment 2.Subject: Adolescents 3.Total sample: 216 4.Variable: Knowledge, attitude 5.Duration: 3 months 6.Frequency: 6 times 7.Source: Personal 8.Content: Health and nutrition on adolescents 	Videos and E-leaflet	In efforts to prevent stunting using video in adolescents, audiovisual media has a practical impact on increasing knowledge (p = 0.046) and attitudes (p = 0.034) rather than using e-leaflet

	Indonesia	9.Placed: Kulon Progo Regency, Yogyakarta		media
Simanjuntak et al. (2022)	The influence of community nutrition education innovations based on social media marketing on knowledge, attitudes, and behavior in efforts to prevent stunting	1.Design: Quasi-experiment 2.Subject: Adolescents, pregnant mother, breastfeeding 3.Total sample: 89 4.Variable: Knowledge, attitude, behavior 5.Duration: 4 months 6.Frequency: Infinite 7.Source: Government 8.Content: Stunting (description, impact, risk factors, prevention) 9.Placed: Indonesia	Social media	The use of social media has a significant effect on increasing knowledge, attitudes, and behavior related to the promotion of stunting prevention and control, marked by an increase in the average post-test index which is higher than the pre-test
Sriwiyanti et al. (2022)	Effectiveness of nutritional education on knowledge and adolescent attitudes about stunting in high school	1.Design: Quasi-experiment 2.Subject: Adolescents 3.Total sample: 50 4.Variable: Knowledge, attitude 5.Duration: 6 months 6.Frequency: Not mentioned 7.Source: Personal 8.Content: Nutrition on adolescents 9.Placed: Dahat Regency, South Sumatra	Booklet	Utilization of booklet media as an effort to prevent stunting in adolescents has a practical impact on increasing the knowledge and attitudes of adolescents related to stunting prevention, especially in fulfilling nutrition (p = 0.000)

promotion for stunting prevention, especially in adolescents (Sriwiyanti et al., 2022).

Along with the current era of digitalization, the use of print media has a weakness. Namely, it is less attractive to teenagers, even though it has various advantages, including being easy to carry, containing brief information that is easy to understand, and not requiring additional tools. The utilization of media on a digital basis, such as social media and applications has effectiveness as a media for health promotion, especially for adolescents. This statement aligns with research on adolescents in the United States that shows digital media has proven effective in providing health-related information because it can reach individuals in various circles quickly (Kruzan et al., 2022). Research in Indonesia shows that health promotion by utilizing social media is

proven to be more effective in obtaining various health-related information (Hunt et al., 2021). Research in West Sumatra shows that using social media has proven effective in increasing youth's understanding compared to not using the press (Neherta and Nurdin, 2021). The difference between these studies lies in the information content and target of intervention, where the research discusses mental health, maternal and child health, and anemia.

In contrast, the target of the intervention is mothers, children, and early adolescents. This research focuses on discussing health promotion media for stunting prevention in adolescents. Therefore, media use is essential in increasing knowledge, attitudes, and behavior of adolescents regarding stunting prevention and reduction.

CONCLUSIONS

The use of media that was initially conventional has transformed into digital media. Therefore, the government needs to be developed health promotion using digital media, including the use of social media as well as application-based media using gadgets and the internet. Social media short videos containing information and entertainment have proven to be effective in increasing adolescents' knowledge. This research can be used as a recommendation for future research so that it is expected to accelerate the delivery of health-related information more quickly, easily, cheaply, and right on target.

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