Use of Android-Based Flipbook Educational Media to Increase Knowledge, Beliefs, Attitudes, and Intentions of Prospective Brides in Stunting Prevention in Semarang City

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ABSTRACT

***Background**: The prevalence of stunting in Semarang City is still relatively high. Low public knowledge about stunting prevention can increase the incidence of stunting. Stunting can be prevented before pregnancy. Prospective brides are strategic targets in stunting prevention so that they can prepare for a healthy pregnancy. Increasing the knowledge of the prospective brides can be done by providing education using media that is following the characteristics of the prospective brides, namely using Android-based flipbook media. **Objective**: The study aims to analyze the effect of education using Android-based flipbook media on increasing knowledge, beliefs, attitudes, and intentions of prospective brides in stunting prevention in Semarang City. **Method**: This study used a quasi-experimental research design with a nonequivalent control group design. The sample of the research was prospective brides totaling 94 people, consisting of treatment and control groups of 47 people. Data collection used pre-test and post-test questionnaires to measure prospective brides' knowledge, beliefs, attitudes, and intentions in stunting prevention. **Results**: The results showed that there were significant differences in the average knowledge score (p = 0.001), beliefs (p = 0.016), attitude (p = 0..001), and intention (p = 0.001) of prospective brides in stunting prevention. So it can be concluded that education about stunting prevention using Android-based flipbook media influences increasing knowledge, beliefs, attitudes, and intentions of prospective brides in stunting prevention.* The greatest influence is shown on the knowledge variable, which is equal to 29,7%.

***Keywords**: Android-based flipbook, education; prospective bride, stunting prevention*

INTRODUCTION

Stunting is a condition of failure to thrive in children under five due to chronic malnutrition, especially in the first 1000 days of life, which can occur since the baby is still in the womb and early after the baby is born. However, the condition of stunting is usually only known after the child is 2 years old. Stunted and severely stunted children are those with body length or height according to age compared to the standard from the WHO-MGRS (World Health Organization-Multicentre Growth Reference Study) (Alfi et al., 2021). Children are categorized as stunted if they have a z-score of less than -2SD/standard deviation and less than -3SD as severely stunted (Alfi et al., 2021; WHO, 2014).

Stunting remains a serious problem in the world. Globally, in 2020 it was reported that 149,2 million children were stunted (WHO, 2021). The prevalence of stunting in Indonesia based on the Global Nutrition Report in 2018 was ranked 108th out of 132 countries, while in Southeast Asia the prevalence of stunting in Indonesia was the second highest after Cambodja (Kemenpppa RI, 2020). According to Basic Health Research data, the national stunting rate decreased in 2013 by 3.,2% and in 2018 by 30.8%. The Indonesian Children's .,7% (Alfi et al., 2021). Central Java Province is one of the provinces with a high prevalence of stunting children. Based on the results of Basic Health Research in 2018, the percentage of severely stunted children under 5 years in Central Java Province by

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11.2%, while the percentage of stunted by 20.1% (Kemenkes RI, 2019). The results of The Indonesian Children Under 5 Years Nutrition Status Survey in 2019 reported the prevalence of stunting children in Central Java Province by 27.7% and the results of The Indonesian Nutritional Status Survey in 2021 by 20.9% (Kemenkes RI, 2021). Based on the Decree of the Minister of National Development Planning No. 42 of 2020 concerning the Determination of Regency/City Expansion of Focus Areas for Integrated Stunting Reduction Interventions in 2021, Semarang City is one of the cities that is the focus location of integrated stunting reduction interventions. The results of monitoring the nutritional status of children under 5 years in Semarang City showed that there was an increase in stunting prevalence in toddlers in 2015-2017, the figures were 1.,4%, 16.5%, and 21% respectively (Cahyati et al., 2019; Meikawati et al., 2021). The prevalence of stunting children in Semarang City in 2021 is based on the results of the Indonesian Nutritional Status Survey by 21.3% (Kemenkes RI, 2021).

Stunting becomes an issue because it is associated with an increased risk of illness and death, disorders of brain development, impaired motor development, stunted mental growth of children, and reduced productivity (Abdullahi et al., 2021; Beal et al., 2018; Rahayu et al., 2018). Society often becomes unaware of the stunting problem because its impact is unnoticeable. The impact of stunting on children can trigger other health problems as the child grows older.

Stunting prevention efforts have been carried out to reduce the stunting rate and become one of the goals in the Global Nutrition Targets for 2025. The success of stunting reduction is a key indicator of the second Sustainable Development Goal of Zero Hunger (Beal et al., 2018). Stunting reduction efforts are required to achieve the World Health Assembly's 2025 target which is to reduce the number of stunting cases to 100 million. The priority actions that can be taken to reduce the number of stunting in children under 5 years by 40% are increasing measurements to identify stunting, increasing understanding of stunting, increasing the scope of stunting prevention activities, increasing nutrition and maternal health improvement interventions starting from adolescence, conducting interventions to improve exclusive breastfeeding practices and complementary foods for breastfeeding, and strengthening community-based interventions by improving water, sanitation, and hygiene (WASH) to prevent infectious diseases in children, such as diarrhea, malaria, and worm disease (WHO, 2014).

Stunting prevention can be done before pregnancy or during the preconception period, which is an important stage to determine a successful pregnancy. The targets range from teenagers to prospective brides and mothers who delay pregnancy. Dealing with stunting problems should be done early before a child is born to break the stunting chain (Rahayu et al., 2018). Prospective brides are the childbearing age group that can be the most strategic targets for the preconception nutrition intervention program because they are the group that is ready to get pregnant. Therefore, it will be more effective if the intervention program to prevent stunting is carried out in groups of prospective brides.

Based on the above, stunting prevention during the preconception period is important in reducing stunting. With the stunting prevention program in the preconception period, it is hoped that prospective mothers can prepare for their pregnancy well so that they can prevent stunting in their children. One of the stunting prevention efforts that can be done since the preconception period is by increasing the knowledge of prospective brides through premarital education about stunting prevention through prospective bride and groom classes facilitated by the Public Health Center and Office of Religious Affairs. However, the implementation of the prospective bride and groom class is still not optimal, namely the frequency of implementation is still lacking and the material presented does not explain stunting in detail.

For the information or message conveyed to be received and digested easily, education needs to be supported by appropriate educational media. Media selection is usually determined by the number of targets, geographical circumstances, participant characteristics, and supporting resources.

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The use of appropriate media helps clarify the information conveyed (Anggraeni, 2019). Android-based flipbooks have the advantages of being easily accessible and having an attractive and appropriate appearance if given to prospective brides who have characteristics whose daily lives are inseparable from digital technology.

After obtaining education, it is hoped that there will be an increase in knowledge about preventing stunting in prospective brides so that they will form the belief to change their attitude according to the knowledge they have. Then the attitude toward the behavior will raise the intention to behave in stunting prevention. According to the theory of planned behavior, intention affects behavior (Ogden, 2007). Behavioral intention is the competency of the individual in carrying out a behavior (Wikamorys & Rochmach, 2017). The prospective brides will intend to carry out stunting prevention behavior if it is supported by positive factors toward stunting prevention behavior. One of the main predictors that influence behavioral intentions is an attitude toward the behavior (Ogden, 2007). Attitudes are determined by individual beliefs about the results of carrying out the behavior (beliefs about outcomes) and are weighed by the evaluation of these outcomes (Glanz et al., 2015). Therefore, it is important to measure the increase in knowledge, beliefs, and attitudes until the intentions of the prospective brides in preventing stunting so that know how far the intention of the prospective brides is behavior to prevent stunting.

This study aims to analyze the effect of education using Android-based flipbook media on increasing knowledge, beliefs, attitudes, and intentions of prospective brides in stunting prevention

METHODS

This research was quantitative and used a quasi-experimental method with a nonequivalent control group design. The research was conducted in Semarang City from November 2022 – February 2023. The population of this study was prospective brides in Semarang City, while the research sample was prospective brides who were registered to be married at the Office of Religious Affairs in several sub-districts in Semarang City (District of East Semarang, North Semarang, Pedurungan and Tembalang). The number of samples in this study was 94 people, consisting of treatment and control groups each of 47 people. A treatment group was given intervention, namely stunting prevention education using Android-based flipbook media, delivered to premarital guidance classes at the religious affairs office including a brief stunting explanation and followed by discussions through WhatsApp groups and online meetings. The control group was only accepting stunting education at the religious affairs office, without discussion through WhatsApp groups and online meetings. Stunting material was included in the material presented in prospective bride and groom classes or premarital guidance but not been presented in detail. The sampling technique used the consecutive sampling method. The research was conducted by providing interventions with stunting prevention education using Android-based flipbook media with a class method. Furthermore, discussions through WhatsApp groups for three weeks and online meetings with Zoom meetings so that interactive communication between researcher and respondents. Each discussion group consists of 8-10 people. The discussion was carried out for three weeks because changing knowledge to intention to behave needs a process, namely education and several discussion sessions. Data collection on knowledge, beliefs, attitudes, and intentions in stunting prevention was carried out before and after the intervention using pre-test and post-test questionnaires. Before the questionnaire was used, the validity and reliability were tested. The pre-test data were taken before the intervention, while the posttest were taken in the fourth week after the intervention. Data analysis used independent t-test, paired t-test, and MANOVA multivariate analysis.

This research has received ethical approval from the Health Research Ethics Commission of the Faculty of Public Health, Diponegoro University No: 396/EA/KEPK-FKM/2022.

RESULTS AND DISCUSSION

Based on the results of interviews with 94 prospective brides registered at

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the Office of Religious Affairs in East Semarang, Pedurungan, North Semarang, and Tembalang sub-districts, a description of the characteristics of the prospective brides was obtained which included age, education, occupation, and information accessibility.

Table 1. Description of Respondent Characteristics

Variable	Treatment Group		Control Group		Total		P Value
	N	%	N	%	N	%	
Age							
< 20 years	0	0	1	2,13	1	1,06	0,315
20-35 years	47	100	46	97.87	93	98.94	
> 35 years	0	0	0	0	0	0	
Level of Education							
No School	0	0	0	0	0	0	0.380
Primary School	0	0	0	0	0	0	
Junior High School	1	2.13	0	0	1	1.06	
Senior High School	17	36.17	22	46.81	39	41.49	
College	29	61.70	25	53.19	54	57.45	
Background of Education							
Health	7	14.89	5	10.64	12	12.77	0.536
Non-Health	40	85.11	42	89.36	82	87.23	
Occupation							
No Work	1	2.13	5	10.64	6	6.38	0.057
Government employees	1	2.13	4	8.51	5	5.32	
Private employees	31	65.96	28	59.57	59	62.77	
Laborer	0	0	3	6.38	3	3.19	
Enterpriser	7	14.89	5	10.64	12	12.77	
Other	7	14.89	2	4.26	9	9.57	
Field of Occupation							
Health	6	12.77	4	8.51	10	10.64	0.503
Non-Health	41	87.23	43	91.49	84	89.36	
Information Accessibility							
Have Access	36	76.60	42	89.36	78	82.98	0.100
Never Access	11	23.40	5	10.64	16	17.02	

Table 1 shows that most of the research respondents have an age range of 20-35 years (98.94%). This age included the reproductive age category. According to the Indonesian Ministry of Health, the reproductive age limit for women is 15-49 years (Kemenkes RI, 2018). However, 20-35 is the best age for reproduction because the reproductive organs still function properly (Azizah et al., 2022).

Prospective brides who are still relatively young in general do not have enough knowledge and experience in preparing for life after marriage, both in terms of health and other matters. They need premarital guidance including health education. Unpreparedness in marriage can have a major impact on life and a negative impact on their children (Fahlevi & Riyanto, 2022). In this case, the prospective brides need health education about stunting prevention to prepare for a healthy pregnancy and reduce the risk of having a stunted child.

Prospective brides have a majority senior high school education level (41.49%) and college (57.45%), with educational backgrounds in non-health fields (87.23%). The higher level of education, it will affect the level of knowledge. As the results of the study stated that there was a relationship between education level and knowledge about stunting prevention (Kristiyanti et al., 2021). However, there was the result of another study showed that there was no significant relationship between education level and knowledge about stunting (Rahmah et al., 2023).

The prospective brides have a variety of jobs, the most dominant being private employees (62.77%) with jobs in the non-health sector (89.36%), and have accessed information about stunting (82.98%). Even though they have an educational background and work in the non-health sector they are rarely exposed to information about stunting; they seek health information, especially about stunting, by accessing information from various media that can be accessed via the internet and social media. Social

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media is in great demand as a source of health information, while the internet is an alternative to meeting health information needs because it is more effective and efficient (Meo & Ganika, 2021). In addition, information is also obtained from families, counseling by health workers, health cadres, etc.

The statistical test results showed that there were no differences in characteristics of the respondents including age, education, occupation, and information accessibility between the treatment and control groups (p-value > 0.05). This means that the treatment and control groups have the same characteristics.

Table 2. Preliminary Description of Knowledge, Beliefs, Attitudes, and Intentions of Prospective Brides About Stunting Prevention in Treatment and Control Groups

Variable	Treatment Group		Control Group		P-Value
	Mean Score	Standard Deviation	Mean Score	Standard Deviation	
Knowledge	67.09	22.46	67.39	16.81	0.942
Belief	76.91	9.72	83.27	12.17	0.006
Attitude	80.54	9.34	82.89	10.93	0.265
Intention	39.95	29.37	32.86	25.16	0.212

Table 2 shows an initial description of the knowledge, beliefs, attitudes, and intentions of prospective brides regarding stunting prevention before being given the intervention. Based on the results of statistical analysis using the independent t-test as presented in Table 2, it is known that there are no significant differences in knowledge, attitudes, and intentions of prospective brides in preventing stunting between treatment and control groups at the beginning of the study (p-value > 0.05). Whereas the belief variable has a p-value of 0.006, meaning that there is a difference in beliefs of prospective brides about the impact of stunting prevention behavior between treatment and control groups at the beginning of the study.

There was no significant difference in the knowledge of prospective brides about stunting prevention before being given education about stunting prevention using Android-based flipbook media between treatment and control groups (p = 0.942). This shows that the knowledge of prospective brides at the beginning of the study in treatment and control groups was the same. This can be seen from the mean score of knowledge at the beginning of the study was almost the same, the treatment group at 67.09, and the control group at 67.39. The results of previous studies also stated that there was no significant difference in the average knowledge value of the prospective brides between treatment and control groups before being given the intervention (p = 0.131) (Sarman & Fauzan, 2022).

There was a significant difference in the prospective bride's belief in the impact of stunting prevention behavior before being given education about stunting prevention using Android-based flipbook media between treatment and control groups (p = 0.006). This shows that the beliefs of the prospective brides at the beginning of the study were not the same in the treatment and control groups. The mean value of belief score at the beginning of the study in the treatment group was 76.91 and in the control group 83.27. Differences in beliefs between the treatment and control groups can be caused by the interventions given to prospective brides outside of research activities, for example from activities carried out by public health centers and family assistance teams to increase the knowledge of prospective brides about stunting. Several sub-districts in Semarang City have implemented activities to accelerate stunting reduction, especially in areas with high stunting cases, such as in North Semarang District. North Semarang District is the focus location of research for the control group. The high number of stunting cases in North Semarang has caused this area to receive more attention from the local government in handling stunting reduction. Therefore, the control group in this study had greater beliefs in the impact of stunting prevention behavior compared to the treatment group due to increased knowledge about stunting obtained from interventions outside the study.

There was no significant difference in the attitude of prospective brides in their behavior to prevent stunting before being given education about stunting

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prevention using Android-based flipbook media between treatment and control groups (p = 0.265). This shows that the attitude of prospective brides at the beginning of the study in treatment and control groups was the same. This can be seen from the average attitude score at the beginning of the study was almost the same, with the treatment group at 80.54 and the control group at 82.89. Likewise, the results of previous studies stated that there was no significant difference in the average value of the attitudes of prospective brides between treatment and control groups before being given the intervention in the form of social media-based nutrition education (p = 0.132) (Sarman & Fauzan, 2022).

There was no significant difference in prospective brides' intention to prevent stunting before being given education about stunting prevention using Android-based flipbook media between treatment and control groups (p = 0.212). This shows that the intentions of prospective brides at the beginning of the study in treatment and control groups were the same. The mean score of intention at the beginning of the study in the treatment group at 39.95 and in the control group at 32.86. At the beginning of the study, the mean score of intention in both groups was still low.

Table 3. Differences in Knowledge, Beliefs, Attitudes, and Intentions of Prospective Brides in Stunting Prevention Between Before and After Intervention

Variable	Group	The Difference in Mean Score	Standard Deviation	P-Value
Knowledge	Treatment	24.00	23.61	0.001
	Control	6.33	11.60	0.001
Belief	Treatment	12.52	9.67	0.001
	Control	0.22	9.51	0.876
Attitude	Treatment	13.13	9.53	0.001
	Control	2.85	8.02	0.019
Intention	Treatment	30.50	20.91	0.001
	Control	12.29	19.14	0.001

Based on the results of statistical analysis used paired t-test as presented in Table 3, it shows that in the treatment group, there are no significant differences in knowledge, beliefs, attitudes, and intentions of the prospective brides in preventing stunting between before and after the intervention, with p-value < 0.05. In the control group, the variables that showed significant differences between before and after intervention were knowledge, attitudes, and intentions (p-value < 0.05). Whereas for the belief variable, there was no difference between before and after intervention (p-value = 0.876).

There was a significant difference in knowledge of prospective brides about stunting prevention between before and after being given education about stunting prevention using Android-based flipbook media in the treatment group (p = 0.000). The results of this study are following research conducted by Fitriami and Galaresa (2021),who used an Android application to provide education about stunting prevention. The results reported that there was a significant difference in increased pre-test and post-test scores of mothers' knowledge (p = 0.001) (Fitriami & Galaresa, 2021). Other studies with family-based nutrition education interventions also reported differences in pre-test and post-test knowledge of stunting prevention with a p-value = 0.001 (Setia et al., 2020). Likewise in the control group, the results of statistical tests showed that there was a significant difference in the knowledge of prospective brides about stunting prevention before and after being given education about stunting prevention using Android-based flipbook media (p = 0.001). This result is inconsistent with previous research which stated that there was no difference in knowledge between pre-test and post-test in the control group (p = 0.214) (Fauziatin et al., 2019). Other research also stated that there was no significant difference in knowledge between the pre-test and post-test in the control group (p = 0.660) (Sarman & Fauzan, 2022). The increase in knowledge in the control group could occur due to information about stunting obtained from sources other than this study. The prospective brides used the internet to find information about stunting. But

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according to the increase in knowledge scores, the group that was given education using Android-based flipbook media had a higher score increase. This showed that the Android-based flipbook has a good effect on increasing knowledge.

There was a significant difference in prospective bride's belief in the impact of stunting prevention behavior between before and after being given education about stunting prevention using Android-based flipbook media in the treatment group (p = 0.001). The results of this study are in line with research by Fadhilah et al. (2020) which stated that there were differences in the beliefs of adolescent mothers regarding exclusive breastfeeding before and after treatment using leaflets, booklets, and videos with p-value = 0.001 (Fadhilah et al., 2020). Whereas in the control group, there was no significant difference in the beliefs of prospective brides about the impact of stunting prevention behavior before and after being given education about stunting prevention using Android-based flipbook media (p = 0.876). The results of this study are consistent with previous research which stated that there was no difference in beliefs before and after treatment using leaflets, booklets, and videos in the control group (p = 0.094) (Fadhilah et al., 2020).

There was a significant difference in the attitude of prospective brides regarding their behavior to prevent stunting between before and after being given education about stunting prevention using Android-based flipbook media in the treatment group (p = 0.001). The results of this study are in line with previous research which stated that there were significant differences in increased pre-test and post-test scores of maternal attitudes after providing stunting prevention education using the Android application (p = 0.001) (Fitriami & Galaresa, 2021). Other studies also stated that there were differences in pre-test and post-test attitudes in preventing stunting with p-value = 0.001 after treatment using a family-based nutrition education intervention (Setia et al., 2020). Likewise in the control group, statistical analysis results showed that there was a significant difference in the attitude of prospective brides in behavior to prevent stunting before and after being given education about prevention stunting using Android-based flipbook media (p = 0.019). This result is in contrast to the research conducted by Fauziatin et al. (2019) who used flipchart media in health education about stunting prevention in prospective brides. The study stated that there was no difference in the average attitude score between the pre-test and post-test regarding stunting prevention (p = 0.967). This means that there is no increase in the average attitude score between the pre-test and post-test in the control group. This was because the control group did not acquire the same knowledge about stunting prevention as the treatment group (Fauziatin et al., 2019). This was supported by other research which also stated that there was no significant difference in attitude between pre-test and post-test in the control group (p = 0.080) (Sarman & Fauzan, 2022). The attitude improvement in the control group can occur because the knowledge of prospective brides in this group has increased even though they did not receive education about stunting prevention. Because prospective brides obtain information about stunting from sources other than this research, this can increase the knowledge of prospective brides, influencing attitudes in behavior to prevent stunting.

There was a significant difference in the intention of prospective brides to behave in preventing stunting between before and after being given education about stunting prevention using Android-based flipbook media in the treatment group (p = 0.001). The results of this study are in line with previous research which stated that there were differences in intentions of teenage mothers regarding exclusive breastfeeding before and after treatment using leaflets, booklets, and videos with p-value = 0.001 (Fadhilah et al., 2020). Likewise in the control group, statistical analysis results showed that there was a significant difference in the intention of prospective brides to behave in preventing stunting between before and after being given education about stunting prevention using Android-based flipbook media (p = 0.001). This result is not following other studies, which reported that there was no difference in the intentions of adolescent mothers regarding exclusive breastfeeding before and after treatment using leaflets,

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booklets, and videos with p-value = 0.135 (Fadhilah et al., 2020).

The Contribution of Providing Education Using Android-Based Flipbook Media on Increasing the Knowledge, Beliefs, Attitudes, and Intentions of Prospective Brides in Stunting Prevention

Multivariate analysis was conducted to analyze the effect of providing education about stunting prevention using Android-based flipbook media on increasing the knowledge, beliefs, attitudes, and intentions of prospective brides in stunting prevention. The statistical test used MANOVA.

Table 4. The Effect of Providing Education Using Android-Based Flipbook Media on Increasing the Knowledge, Beliefs, Attitudes, and Intentions of Prospective Brides in Stunting Prevention

Variable	Mean Difference	P-Value	95% CI	R Square
Knowledge	17.37	0.001	11.838 – 22.897	0.297
Belief	5.95	0.016	1.134 – 10.762	0.061
Attitude	7.92	0.001	3.847 – 11.999	0.139
Intention	25.30	0.001	15.740 – 34.851	0.231

Based on Table 4, the results show that there are significant differences in mean scores of knowledge (p = 0.001), beliefs (p = 0.016), attitudes (p = 0.001), and intentions (p = 0.001) of prospective brides in stunting prevention. This means that there was an effect of providing education about stunting prevention using Android-based flipbook media on increasing the knowledge, beliefs, attitudes, and intentions of prospective brides in stunting prevention. The results of previous research stated that education on stunting using an Android application increased mothers' knowledge and attitudes at the Tenayan Raya Pekanbaru Health Center (p = 0.001) (Fitriami & Galaresa, 2021). Other studies also stated that the WhatsApp group as an educational tool proved effective in increasing the knowledge and nutritional attitudes of pregnant women. WhatsApp groups can be used as an educational alternative for pregnant women during the Covid-19 pandemic because they do not require face-to-face meetings (Melati & Afifah, 2021).

The effect of providing education on increasing the knowledge score is at 29.7%, belief score at 6.1%, attitude score at 13.9%, and intention score at 23.1%. The greatest influence is shown on the knowledge variable, which is equal to 29.7%. The effect of education on increasing the knowledge of prospective brides about stunting prevention is considered effective because there is a significant increase in scores after being given education using Android-based flipbook media.

There are limitations of this study such as the time to collect research data, could not be carried out simultaneously because the number of respondents was limited so it required a longer time. The researcher conducted home visits to provide education to several respondents who were busy. This meant that not all educational processes were carried out using the class method.

CONCLUSION

There was an influence of education about stunting prevention using Android-based flipbook media on increasing the knowledge, beliefs, attitudes, and intentions of prospective brides in stunting prevention. The greatest influence is shown on the knowledge variable, which is equal to 29.7%. The effect of education on increasing the knowledge of prospective brides about stunting prevention was considered effective because there was a significant increase in scores after being given education using Android-based flipbook media followed by discussions through WhatsApp groups and online meetings. In particular, the health office can use Android-based flipbook media as an alternative learning medium in providing education about stunting prevention for prospective bride and groom classes held by the public health center.

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