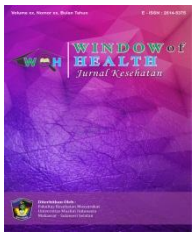
Window of Health : **Jurnal Kesehatan, Vol. 8 No. 4 (October, 2025) : 428-438** **E-ISSN 2614-5375**

Window of Health Jurnal Kesehatan
journal homepage : www.jurnal.fkmumi.ac.id



ARTICLE RESEARCH
URL artikel: http://jurnal.fkmumi.ac.id/index.php/woh/article/view/woh8017

Adolescents' Knowledge and Attitudes Toward Reproductive Health Using Website and Booklet Media

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ABSTRACT

Sexuality is considered a taboo topic by society, making it difficult to discuss openly. Parents typically provide minimal guidance, while teenagers frequently feel too embarrassed to ask questions. To overcome these barriers, a more engaging and accessible platform, such as a website dedicated to reproductive health, is necessary to help teenagers gain a better understanding of the topic. This study aims to analyze the influence of reproductive health education through website media on changes in adolescent knowledge and attitudes. This research is a quasi-experiment, a quantitative study. The research was conducted from March to November 2024. The respondents/subjects were 200 teenagers aged 15-18 years in Palangka Raya who owned a smartphone or laptop. The intervention group had an average knowledge score of 22.90, higher than the control group's score of 20.49. The Independent T-test showed a significance value of 0.000 (<0.05), indicating that education using the booklet was less effective in increasing knowledge compared to the website+booklet. Similarly, the intervention group's average attitude score was 127.67, higher than the control group's score of 122.08. The Independent T-test showed a significance value of 0.000 (<0.05), indicating that using only the booklet was less effective in improving attitudes compared to the combined website+booklet approach. Education on reproductive health delivered through a website and booklet is more effective at enhancing knowledge and attitude scores in adolescents than education provided solely through a booklet. Ensure that the digital platform is accessible to all adolescents, including those in remote areas.

Keywords: Website, reproductive health, adolescents, booklet

PUBLISHED BY :
Faculty of Public Health
Universitas Muslim Indonesia
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Article history
Received 07 May 2025
Received in revised form 04 September 2025
Accepted 20 October 2025
Available online 25 October 2025

INTRODUCTION

Adolescence is a critical transition period in human development. Around the world, adolescents face major challenges related to their reproductive and sexual health. Many begin sexual activity without adequate knowledge and skills to protect themselves, resulting in risks such as unwanted pregnancies, unsafe abortions, and sexually transmitted infections (STIs), including HIV/AIDS [1]. Globally, in 2021, the adolescent birth rate was reported to be 42 per 1000 girls aged 15-19 years, with 777,000 births each year to girls under 15 in developing countries. Furthermore, adolescents are also vulnerable to other risk behaviors, such as alcohol consumption, psychoactive drug use, and unsafe sexual practices, with 1.7 million adolescents worldwide living with HIV in 2021[2].

In Indonesia, adolescents' reproductive health remains concerning. The 2023 child profile report shows that the percentage of child marriages under 18 years in 2022 reached 8.06%, with the highest prevalence in NTB (16.23%), Central Kalimantan (14.72%), and Gorontalo (13.65%). Survey data also indicate that 2% of male adolescents and 1% of female adolescents admitted to premarital sex, with the average age of first being 18 years. Alarmingly, the composite index of adolescent knowledge on reproductive health was only 48.5 out of 100, reflecting insufficient knowledge and awareness[3].

Despite the high risk, sexuality is still considered taboo in society and rarely discussed openly. Parents provide minimal explanation of reproductive health, while adolescents feel embarrassed to ask questions. Limited access to accurate information contributes to the knowledge gap. Female adolescents, in particular, often have less knowledge about sexual development than their male peers due to cultural norms and self-restrictions in seeking information[4,5,6].

A preliminary study conducted in 2019 among 20 female students in Palangka Raya revealed that 13 participants admitted to not fully understanding reproductive health and felt embarrassed to discuss reproductive health issues. Highlighting the urgent need for innovative health education approaches tailored to adolescents' characteristics and learning preferences.

Health education serves as a bridge between information and practice, aiming to shape positive health behaviors. To be effective, health education must use media that are accessible and engaging for adolescents. According to diffusion of innovation theory, digital media can be widely accepted by adolescents as an effective means of disseminating new information. As early adopters of technology, adolescents are more likely to absorb knowledge delivered through innovative digital platforms such as websites[7,8].

Digital media has proven to be a powerful tool improving adolescent knowledge, reducing risky behaviors, and enhancing digital literacy in the health sector[9]. Therefore, developing website-based reproductive health education is expected to provide unique, interesting, and interactive content that can effectively improve adolescents' knowledge and attitudes toward reproductive health.

METHOD

This study is a quasi-experimental study with a pre-posttest and control group design. The pretest-posttest design measures cause-and-effect relationships, indicating whether the website intervention significantly improved knowledge and attitudes. This study was conducted in March - September 2024 in Palangka Raya City, Central Kalimantan, with research subjects being 200 adolescents aged 14-18 years who have smartphones or laptops. The sample size of 200 respondents (100 per group) was determined to achieve adequate statistical power, ensure representativeness, and anticipate potential attrition. The research respondents were divided into two groups, namely 100 people in the intervention group and 100 in the control group. Before the intervention, both groups were given a pretest to assess their initial knowledge and attitudes, and after the intervention, a posttest was conducted to evaluate the changes that occurred. The intervention group was given adolescent reproductive health education through the website media, which can be accessed at the link: https://sitasima-polkesraya.com/ or via the QR code below:

The intervention consisted of website-based reproductive health education aimed at enhancing adolescent knowledge and promoting positive attitudes, delivered through digital media appropriate to their usage patterns. The control group was given reproductive health education through a booklet. Data analysis was carried out univariately with frequency distribution and bivariate using the t-test to compare knowledge and attitudes before and after the intervention. This study has undergone an ethical review process through the health research ethics commission of the Palangka Raya Ministry of Health Polytechnic with a statement of ethical feasibility number: 230/IV/KE.PE/2024.

RESULTS

This research was conducted on 200 respondents, and the results can be seen in the tables 1:

Table 1. shows that the gender in the control group has the same number of males and females, each at 50%. While in the intervention group (website + booklet), it is females, which is 54%. In the control group, the age group is 15 years old at 45%, while in the intervention group, the age group is 16 years old at 64%. The youngest age in the control and intervention groups is 14, and the oldest is 18. The socio-economic status of the control group is highest, with an income of 1-3 million at 40%, while the intervention group mostly has an income of > 3 million at 39%.

Table 1. Frequency Distribution of Adolescent Characteristics at MA Darul Ulum, Palangka Raya City

Variables	Booklet (Control)		Website (Intervention)	
	N	%	n	%
Gender				
Man	50	50	46	46
Woman	50	50	54	54
Age (Years)				
14	1	1	1	1
15	45	45	25	25
16	40	40	64	64
17	13	13	9	9
18	1	1	1	1
Socio-Economic				
>3 Million	26	26	39	39
1-3 Million	46	46	37	37
500 thousand - < 1 million	28	28	24	24
Parents' job				
civil servant				
Trader	19	19	33	33
Laborer	22	22	10	10
Other	7	7	7	7
	52	52	50	50
Information Source				
Friend	89	89	89	89
Teacher	11	11	11	11

The parents of the parents in the control group are other professionals at 52%, while the parents in the intervention group are with other professions at 50%. The source of reproductive health information from the control and intervention groups is mostly from their respective friends at 89%.

Table 2. Differences in Mean, Minimum, Maximum, Standard Deviation, and Variance Values in Knowledge

Knowledge	Control Group		Intervention Group	
	Pretest	*Posttest*	*Pretest*	*Posttest*
n	100	100	100	100
Mean	19.85	20.49	21.55	22.90
Minimum	14	17	14	27
Maximum	25	25	26	30
Standard Deviation	2,668	2,873	2,492	3,236

Table 2. The results indicate that the average knowledge score in the control group increased modestly from 19.85 in the pretest to 20.49 in the posttest, reflecting a 0.64-point improvement. In contrast, the intervention group, which received reproductive health education through the website, demonstrated a greater increase, with the mean score rising from 21.55 in the pretest to 22.90 in the posttest, a difference of 1.35 points. Moreover, the minimum score in the intervention group increased substantially from 14 to 27, while the control group showed only a slight increase from 14 to 17. The maximum score achieved in the intervention group was also higher (30) compared to the control group

(25). These findings suggest that the website-based intervention was more effective in enhancing adolescents' knowledge than the booklet, as it not only improved the average score but also raised both the lowest and highest scores among respondents.

Table 3. Differences in Mean, Minimum, Maximum, Standard Deviation, and Variance Values in Adolescent Attitudes

Attitude	Control Group		Intervention Group	
	Pretest	*Posttest*	*Pretest*	*Posttest*
n	100	100	100	100
Mean	121.04	122.08	116.99	127.67
Minimum	90	63	93	100
Maximum	146	130	147	149
Standard Deviation	14,614	14,425	16,450	10,286

In table 3. The results demonstrate that the average attitude score in the control group increased slightly from 121.04 in the pretest to 122.08 in the posttest, reflecting a modest 1.04-point improvement. However, the minimum score in the control group declined from 90 to 63, and the maximum score also decreased from 146 to 130, indicating inconsistency in the effectiveness of the booklet-based intervention. In contrast, the intervention group, which received reproductive health education via the website, showed a substantial improvement, with the mean score rising from 116.99 in the pretest to 127.67 in the posttest, an increase of 10.68 points. Additionally, the minimum score in the intervention group improved from 93 to 100, while the maximum score increased from 147 to 149. The standard deviation also decreased from 16.45 to 10.29, suggesting greater homogeneity in participants' attitudes after the intervention. These findings indicate that the website-based intervention was significantly more effective than the booklet in fostering positive attitudes toward reproductive health among adolescents..

Table 4. Pretest-Posttest Values of Knowledge About Reproductive Health in the Control Group and Intervention Group at Senior High Schools in Palangka Raya City in 2024

Group	Data	Mean	Difference	*p*
Booklet (Control)	*Pretest*	19.85	0.64	0.20
	Posttest	20.49		
Website (Intervention)	*Pretest*	21.55	1.35	0.00
	Posttest	22.90		

* Test: *Paired Samples Test*

Based on Table 4, data shows that in both groups, there was a change in knowledge before and after the intervention was given. However, in the intervention group that was given the website, there was a more significant average difference than the control group. The results of the statistical test showed a p-value = 0.20 in the control group, which means there was no difference, while in the intervention group, it showed a p-value = 0.00, which means there was a difference in knowledge before and after in adolescents who were given reproductive health education using the website media.

Table 5. Pretest-Posttest Values of Attitudes About Reproductive Health in the Control Group and Intervention Group at Senior High Schools in Palangka Raya City in 2024

Group	Data	Mean	Difference	P*
Booklet (Control)	Pretest	121.04	1.04	0.43
	Posttest	122.08		
Website+booklet (Intervention)	Pretest	116.99	10.68	0.00
	Posttest	127.67		

* *Paired Samples Test*

Based on table 3, data shows that in both groups there was an average change in attitudes before and after the intervention was given. However, in the intervention group that was given the website, there was a greater average difference than the control group. The results of the statistical test showed a p value = 0.43 in the control group, which means there was no difference, while in the intervention group, it showed a p value = 0.00, which means there was a difference in attitudes before and after in adolescents who were given reproductive health education using the website media.

Table 6. Differences in Posttest Values Regarding Reproductive Health Knowledge in the Control and Intervention Groups

Knowledge	N	After Intervention	
		Mean	p*
Booklet	100	20.49	0,000
Website+booklet	100	22.90	

*Unpaired T-Test

Based on table 6, the average knowledge score in the intervention group with website + booklet media was 22.90, higher than the control group with booklet media of 20.49. The Unpaired T-test obtained a p value of 0.000 (<0.05) so it can be concluded that education with website media is more effective in increasing knowledge scores compared to booklet media.

Table 7. Differences in Posttest Values Regarding Reproductive Health Attitudes in the Control and Intervention Groups

Attitude	N	After Intervention	
		Mean	p*
Booklet	100	122.08	0,000
Website+booklet	100	127.67	

*Unpaired T-Test

Based on Table 7, the average attitude score in the intervention group with website+booklet media was 127.67, higher than the average attitude score of the control group with booklet media of 122.08. The Unpaired T-test obtained a p value of 0.000 (<0.05). It can be concluded that reproductive health education with website+booklet media is more effective in increasing attitude scores compared to booklet media.

DISCUSSION

The control group showed a gender balance with the same percentage of males and females, each at 50%. In contrast, the intervention group (which used websites and booklet media) was dominated by females, with a percentage of 54%. This indicates a small difference in gender distribution, which may affect the results in the intervention group due to differences in gender perspectives in receiving information. The age range in both groups ranged from the youngest, 14 years old, to the oldest, 18 years old. This dominant age difference may affect understanding and attitudes towards the information presented, considering that adolescents' cognitive development and information needs vary at each age. This economic status factor can play a role in the ability to access technology (such as websites) and the level of exposure to reproductive health information[10]. With a higher income, participants from the intervention group may have better access to the digital media used in this study. Variations in parental occupations can provide an overview of the educational background and family exposure to health issues, including reproductive health. This can affect the attitudes and knowledge of participants. This shows that adolescents tend to rely on their friendship environment to obtain information related to reproductive health. Information from friends is not always reliable, so additional media such as websites or booklets can play an important role in providing more valid and accurate information[11]. These differences in demographic background are important to note because age, socioeconomic status, and gender can influence how participants receive and respond to information. The media used in the intervention (website and booklet) are expected to be able to adjust to the specific needs of the age group and utilize the influence of friends as a medium for information dissemination. By knowing the dominant initial sources of information and the participants' demographic background, the reproductive health education strategy implemented can be more targeted and effective[12].

This study shows that website-based digital media is more effective in increasing teenagers' knowledge and attitude about health reproduction than booklet media. This is closely related to the characteristics of digital media, which are that they are more interactive and flexible. Some recent studies have confirmed that the use of digital media in education allows teenagers to be involved in a way that is active with material. Finally, it increases motivation to study and master knowledge. This is in line with findings previously that digital media, such as websites, allow access to more information fast And interactively, which can help teenagers absorb and understand information in a more effective way. The use of the website also gives freedom to access information when and where only, increasing the frequency and quality of exposure information[13,9].

Group interventions using website media, which significantly increased knowledge scores and improved attitude after the intervention, demonstrate that this medium successfully met adolescents need for reproductive health information[14,15]. The website allows the integration of various forms of content, such as text, images, and videos, which contribute to a better understanding of the material provided. This finding is consistent with the Self-Determination Theory, which states that digital media supports

adolescents basic psychological need, such as autonomy and competence, thereby enchancing engagement and comprehension[9, 16,17]. Recent studies also confirm this effectiveness found that web-based interventions are effective in promoting positive health behavior change among adolescents[12], while comprehensive sex education delivered through self-study websites was highly acceptable and improved learning outcomes among young people[18]. Trial in China demonstrated that an online sexual and reproductive health program significantly improved knowledge, attitudes, and behaviors among adolescents[17]. These results reinforce the conclusion that website-based digital media provides a flexible, interactive, and engaging platform for enhancing adolescents' reproductive health knowledge and attitudes

One of the essential things that makes a website more effective is its ability to personalize the experience study for its users. With the website, teenagers can access content according to speed study alone, choose the most relevant topics, and repeat material whenever needed. The website should also be updated in a way that provides information, which is very important in education and health, where the development of knowledge changes fast [18,19] On the other hand, booklets, as printed media, are more limited in flexibility and ability to be enjoyable and interest teenagers.

This result study also confirms findings that the booklet media, despite improving knowledge and attitude, is less effective than website media. This is due to the characteristic static of the booklet, which is only dependent on text without deep interactivity. As a digital generation, teenagers tend to respond to interactive content and multimedia[20]. The website allows teenagers to explore the information more in accordance with their interests[21], while the booklet is more limited in the depth of information that can be delivered.

Approach based on digital media such as on thus study also support theory *Social Cognitive Learning* from Bandura, who stated that individual study through observation and interaction with environment[22]. The website allows teenagers to observe behavior and recommend attitude-related health reproduction through visual content such as videos or infographics, which helps build cognitive skills And required behavior for making the right decision [23].

Differences in score, knowledge, and attitude between group control and intervention show that website-based digital media can convey information more effectively and change teenagers' attitudes toward health reproduction. This is in harmony with a study previously demonstrated that involvement in teenagers with digital media increases trust in making more decisions related to health reproduction. Digital media also has proven to reduce obstacles in accessing sensitive information, such as health reproduction, which is often considered taboo to discuss in an open way[24,25].

Thus, the study results strengthen the argument that website-based digital media is a more effective tool than conventional media, such as booklets, for educating teenagers about reproductive health. These findings also have important implications for the development of future health promotion programs, particularly those targeting teenagers in the digital era.

This is also in line with the Health Belief Model (HBM), which suggests that a person's attitude towards health is significantly influenced by their perception of risks and the benefits of taking health-related actions[26] In this case, the website aims to enhance understanding of reproductive health risks, such as pregnancy and sexually transmitted infections, and provides information on preventive actions. The role of digital media in promoting health has also been demonstrated in various international studies on reproductive health. For example, research by Rice and West (2024) shows that digital literacy contributes to increasing knowledge among teenagers on various health issues, including mental health and the prevention of infectious diseases[9].

In general, this research offers practical implications for designing effective health programs for society. In the digital era, health promotion programs that still rely on print media have become less relevant for a generation growing up in a world filled with technology and digital information. Therefore, this research provides a strong argument for policymakers and health professionals to invest more in digital platforms for health education campaigns

ACKNOWLEDGEMENT

The author would like to thank the Team and enumerators who helped in the research, students at State Senior High School 3, State Senior High School 4, and Madrasah Aliyah Darul Ulum Palangka Raya who were willing to be research respondents and accompanying teachers who helped carry out this research. The Director of the Palangka Raya Ministry of Health Polytechnic and the Head of the Research and Community Service Unit of the Palangka Raya Ministry of Health Polytechnic provided funding for this research, enabling its successful completion.

CONCLUSIONS AND RECOMMENDATIONS

Education on reproductive health delivered through a website and booklet is more effective at enhancing knowledge and attitude scores in adolescents than education provided solely through a booklet. Ensure that the digital platform is accessible to all adolescents, including those in remote areas.

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