

Research Article

The Effectiveness of Flipping Book Media on Adolescents' Knowledge and Attitudes Towards Premarital Sex

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ABSTRACT

Sexual education remains a sensitive topic in Indonesian society despite the increasing rates of unwanted pregnancies and sexually transmitted infections among adolescents. In 2024, the Ministry of Health Indonesia recorded 35,415 new HIV cases and 12,481 new AIDS cases. According to WHO (2025), unintended pregnancies among girls aged 15–19 often result in unsafe abortions, especially in low- and middle-income countries. This study aimed to determine the effect of sexual education using flipping book media on adolescents' knowledge and attitudes toward premarital sex at SMK Muhammadiyah Larangan. A quantitative pre-experimental one-group pretest-posttest design was employed involving 90 students selected through stratified random sampling. Data were analyzed using the Wilcoxon signed-rank test due to non-normal distribution. The results showed significant differences in both knowledge ($p = 0.01$) and attitude ($p = 0.01$) before and after the intervention, indicating that sexual education using flipping book media effectively improves adolescents' knowledge and attitudes regarding premarital sex.

INTRODUCTION

Adolescence is a transitional phase from childhood to adulthood, characterized by dynamic changes and challenges. This phase is frequently referred to as a turbulent period, characterized by internal conflicts and emotional instability. Erik Erikson stated that adolescence is a stage of achieving maturity in various aspects, including mental, emotional, social, and physical development (Wong & Hockenberry, 2021). The changes that occur during this period involve both biological and psychological dimensions. Biologically, rapid physical growth occurs due to hormonal activity and is marked by the onset of puberty (Kyle & Carman, 2021). From a psychosexual perspective, Sigmund Freud explained that adolescents tend to spend more time with peers and possess a high level of curiosity, including toward new experiences such as sexuality (Wong & Hockenberry, 2021).

In Indonesia, sexuality remains a taboo and often embarrassing topic to discuss (Supit et al., 2023). Cultural norms frequently position such discussions as inappropriate, resulting in reluctance among adults to address the issue openly (Supit et al., 2023). Consequently, education regarding sexual and reproductive health remains limited, leading many adolescents to misinformation and belief in myths about sex (Nurhayati et al., 2024). A survey conducted by Durex in Indonesia revealed misconceptions among young people regarding pregnancy prevention methods. About 54% of respondents believed that engaging in sexual intercourse while standing could prevent conception, while 53% believed that withdrawal was an effective method of contraception (Durex, 2019). Comprehensive and continuous sexuality education for adolescents serves as a critical foundation to provide a holistic understanding of reproductive health and functions as a preventive mechanism to minimize deviant behaviors often stemming

from misconceptions or lack of access to accurate information (Bawono et al., 2024). Adolescents' moral perceptions are shaped through complex interactions between educational factors, cultural background, and individual experiences. Therefore, implementing character education is essential during this critical developmental stage to prevent negative behaviors and guide the formation of a healthy personal identity (Ani et al., 2021).

Currently, premarital sexual activity has shown a significant increasing trend across various age groups in Indonesia, particularly among adolescents. According to the latest report from the Ministry of Population and Family Development (BKKBN), 59% of female and 74% of male adolescents aged 15 to 19 years reported having engaged in premarital sexual activity (BKKBN, 2017). A global study conducted by Durex (2019) revealed that approximately one-third (33%) of Indonesian respondents admitted to having engaged in penetrative sexual intercourse before marriage. More concerningly, more than half (58%) of this group were within a relatively young age range (Durex, 2019). This data is supported by an independent study by Honestdocs involving 6,877 participants, showing that although 74% of adolescents aged 12 to 17 were not sexually active, 21% reported engaging in sexual activity on a daily basis (Belinda & Setiawan, 2020). Similarly, Syafitriani et al. (2022) found that 4.9% of Indonesian adolescents engaged in premarital sexual relations, influenced by demographic characteristics (age, education, occupation), level of reproductive health understanding, and social environment, including dating behavior and peer interactions.

Premarital sex refers to sexual activity conducted outside the bounds of legal or religious marriage (Meylawati & Anggraeni, 2024). Among adolescents, this behavior may be influenced by external factors such as peer environment, exposure to

pornographic content, and digital technology use (Aulia & Winarti, 2020). Premarital sexual behavior often develops progressively, beginning with romantic attraction, dating, non-penetrative physical contact, and ultimately sexual intercourse (Mulya & Kosassy, 2024). Such behavior may lead to serious consequences, including unplanned pregnancies, psychological distress such as anxiety and regret, reproductive complications, abortion, and an increased risk of sexually transmitted infections (Natalia et al., 2021). The Indonesian Ministry of Health recorded 35,415 new HIV cases and 12,481 new AIDS cases throughout 2024 (CNN Indonesia, 2024). Unwanted pregnancies among girls aged 15 to 19 often end in abortion, which is frequently performed unsafely in low- and middle-income countries (WHO, 2025). Therefore, comprehensive reproductive and sexual health education is crucial for both male and female adolescents, as sexual education has been proven to reduce early pregnancies, prevent risky sexual activity, and improve adolescents' understanding of their bodies and reproductive health (WHO, 2025).

Sexual education plays an essential role in shaping adolescents' knowledge and attitudes toward sexuality, particularly in preventing premarital sexual behavior (Meilia et al., 2022). Previous studies have used leaflet media and found significant effects on adolescents' knowledge levels (Suhartiningsih et al., 2024). Education through booklets has also shown an influence on increasing knowledge regarding adolescent sexual health (Islamiati et al., 2022). Furthermore, education using audiovisual media has been proven to enhance adolescents' understanding of reproductive health (Ayu et al., 2020). These findings also support the use of game-based learning and gamification as effective approaches for conveying and improving sexual health knowledge among secondary school

students (Haruna et al., 2018). However, these media-based approaches still face limitations in terms of flexibility and accessibility.

Flipping book media is an interactive, structured digital learning tool that integrates text, images, and sound in multimedia format, allowing users to engage more actively (Sari & Ahmad, 2021). A flipping book is a digital book designed to present text, images, sound, and video in an engaging way to enhance students' enthusiasm and comprehension during the learning process (Masitoh, 2022). It can also increase students' motivation and interest in learning (Juliani & Ibrahim, 2023). The advantages of flipping book media include clear and concise material presentation, practicality, and ease of access anytime and anywhere. Furthermore, the flipping book has been proven effective as a learning medium (Juliani & Ibrahim, 2023). For instance, Fauziah (2024) found that audiovisual and flipping book media improved adolescents' knowledge about the dangers of free sex. Similarly, Prihastani et al. (2024) found increased student knowledge regarding diabetes prevention after health promotion using flipping book media. Khotimah et al. (2023) also reported that flipping book positively influenced learning outcomes in the IPAS subject among students at SMK Negeri 2 Pangkep. With these successes, the use of flipping book media in sexual education research holds great potential for similar positive outcomes if properly adapted. However, the use of flipping book as a medium in sexual education research remains limited despite its proven effectiveness in learning.

METHOD

This study employed a quantitative pre-experimental method with a one-group pretest-posttest design. The population in this study consisted of all students at SMK Muhammadiyah Larangan from grades 10, 11, and 12, totaling 839 students. The sample

size was determined using the Slovin formula with a 10% margin of error, resulting in 90 respondents. The sampling technique used was stratified random sampling, with strata based on grade level, and samples from each stratum were selected using simple random sampling.

The research instruments were adapted from the knowledge questionnaire and attitude questionnaire developed by Ramadanti and Rohayati (2022). The knowledge questionnaire consisted of 20 questions constructed using a Guttman scale with “true” and “false” answer options. Positive statements were scored 1 for correct answers and 0 for incorrect answers, while negative statements were scored 1 for incorrect answers and 0 for correct answers. Meanwhile, the attitude questionnaire consisted of 15 statements using a four-point Likert scale. Statements were categorized as positive or negative. For favorable statements, the scoring was: Strongly Agree = 4, Agree = 3, Disagree = 2, and Strongly Disagree = 1. For unfavorable statements, the scoring was reversed: Strongly Agree = 1, Agree = 2, Disagree = 3, and Strongly Disagree = 4.

The questionnaires used in this study had previously undergone validity testing and were found to be valid. The knowledge questionnaire obtained validity coefficient values ranging from $r = 0.345$ to $r = 0.762$, while the attitude questionnaire showed values ranging from $r = 0.326$ to $r = 0.640$. The reliability test results indicated a Cronbach’s alpha value of 0.916 for the knowledge instrument and 0.829 for the attitude instrument. These results indicate that both instruments were reliable and suitable for use in this study.

The research was conducted from January to July 2025 at SMK Muhammadiyah Larangan. The study received ethical clearance No: KEPK/UMP/153/III/2025 from the Health Research Ethics Committee of Universitas Muhammadiyah Purwokerto. The flipping book media used in this study

was assessed for feasibility by one media expert and one sexual education material expert. The assessment was conducted using a validation questionnaire evaluating content accuracy, language clarity, visual design, and media usability. The feasibility test results showed that the flipping book media achieved a total score of 57 out of 60 (95%) from the media expert and 54 out of 60 (90%) from the material expert. Overall, these results indicate that the flipping book media is highly feasible and suitable for use as an educational intervention for adolescents. The normality test was conducted using the Kolmogorov-Smirnov test, as the sample size exceeded 50. The results showed that the data were not normally distributed, so statistical analysis was carried out using the non-parametric Wilcoxon Signed Rank Test.

RESULTS

Respondent Characteristic

Table 1. Respondent Characteristic Distribution based on gender, age and class.

Characteristic	Frequency	(%)
Gender	15	15,8
Male	46	48,4
Female	34	35,8
Age		
15	32	35,6
16	25	27,8
17	20	22,2
18	13	14,4
Grade Class		
10	32	35,6
11	31	34,4
12	27	30,0

Source: Primary Data, 2025

As shown in Table 1, the majority of respondents in this study were female, totaling 55 individuals (61.11%), while male respondents numbered 35 individuals (38.89%). Based on age characteristics, most respondents were 15 years old, totaling 35 students (35.56%). In addition,

respondents from grade 10 numbered 32 students (35.56%), grade 11 numbered 31 students (34.44%), and grade 12 numbered 27 students (30%).

Knowledge Before and After Sexual Education Using Flipping Book Media Among Adolescents

Table 2. Knowledge Pretest Category

Category	Frequency	(%)
Good	1	1,01
Fair	32	35,6
Poor	57	63,3
Total	90	100,0

Source: Primary Data, 2025

Table 3. Knowledge Posttest Category

Category	Frequency	(%)
Good	77	85,6
Fair	13	14,4
Poor	0	0,00
Total	90	100,0

Source: Primary Data, 2025

The results of the study showed a significant increase in adolescents' knowledge levels after receiving sexual education using flipping book media. Before the intervention, only 1.1% of respondents had good knowledge, whereas after the education, this proportion increased to 85.6%. This finding indicates that the use of flipping book as a learning medium is effective in enhancing adolescents' knowledge regarding premarital sex.

Attitudes Before and After Sexual Education Using Flipping Book Media Among Adolescents

Table 4. Attitudes Pretest Category

Category	Frequency	(%)
Positive	89	98,9
Negative	1	1,01
Total	90	100,0

Source: Primary Data, 2025

Table 5. Attitudes Posttest Category

Category	Frequency	(%)
Positive	90	100,0
Negative	0	0,00
Total	90	100,0

Source: Primary Data, 2025

The results of the study showed an improvement in adolescents' attitudes after receiving sexual education using flipping book media. Prior to the intervention, 98.9% of respondents demonstrated a positive attitude, which increased to 100% after the education. This indicates that the flipping book media was effective in strengthening adolescents' positive attitudes toward premarital sex prevention.

The Effect of Sexual Education Using Flipping Book Media on Knowledge and Attitudes Toward Premarital Sex Among Adolescents

Table 6. Distribution of Pretest and Posttest Scores on Knowledge and Attitude

Variabel	Min	Max	Mean	SD
Knowledge Pretest	30,0	95,0	54,5	10,2
Knowledge Posttest	65,0	100,0	84,7	7,07
Attitude Pretest	50,0	91,6	80,9	9,09
Attitude Posttest	53,3	95,0	86,1	7,06

Source: Primary Data, 2025

Based on the analysis of the pretest and posttest data, the results revealed a substantial improvement in adolescents' knowledge after receiving sexual education using flipping book media. During the pretest phase, knowledge scores about premarital sex ranged from a minimum of 30,0 to a maximum of 95,0, with an average score of 54,5. These findings indicate that most respondents initially had a relatively low level of understanding regarding premarital sexual behavior, reproductive

health, and its associated risks. Limited access to reliable sexual education sources and the sensitivity of the topic within the school environment may have contributed to this lack of knowledge.

After the intervention, the posttest results showed that the knowledge scores increased significantly, ranging from 65,0 to 100,0, with an average score of 84,7. This demonstrates that the flipping book media was effective in enhancing students' understanding of reproductive health and the consequences of premarital sexual behavior. The interactive and visually engaging nature of the flipping book, which combines text, images, and audio-visual elements, helped students better comprehend complex information and retain it more effectively. The improvement in knowledge reflects the success of health education programs in empowering adolescents to make more informed and responsible decisions regarding their reproductive health.

Similarly, the results for attitude scores showed a positive shift after the intervention. Before receiving the sexual education through flipping book media, the respondents' attitudes toward premarital sex had scores ranging from 50.0 to 91.6, with an average of 80.9, indicating that while most adolescents demonstrated positive attitudes, some still held permissive or uncertain views. After the intervention, posttest scores ranged from 53.3 to 95.0, with an average of 86.1, reflecting a notable improvement in students' attitudes. This change suggests that the use of flipping book media not only increased knowledge but also positively influenced adolescents' perceptions, encouraging them to adopt healthier, more responsible attitudes toward premarital sexual behavior.

Table 7. Wilcoxon Test

Variable	Z Score	P-value
Knowledge Pretest- Posttest	-8,139	<0,001
Attitudes Pretest- Posttest	-5,851	<0,001

Source: Primary Data, 2025

The significance value of <0,001 for both knowledge and attitude indicates a p-value <0,05, showing a significant effect. This means that sexual education using flipping book media had a significant influence on adolescents' knowledge and attitudes toward premarital sex at SMK Muhammadiyah Larangan. In addition, the effect size of the flipping book sexual education on knowledge was 0,858, while the effect size on attitude was 0,617, indicating that both had a large effect (Field, 2018).

DISCUSSION

This research was conducted at SMK Muhammadiyah Larangan from January to July, involving 90 students as respondents, the majority of whom were female (61.1%), while male students accounted for 38.9%. Respondents were drawn from grades 10, 11, and 12. The purpose of this study was to assess changes in adolescents' knowledge and attitudes before and after being given education on premarital sex through the use of flipping book media. The normality test using the Kolmogorov-Smirnov method showed that both the pretest and posttest data were not normally distributed; therefore, the Wilcoxon test was applied. The Wilcoxon test results showed a p-value < 0.001 for both knowledge and attitude, indicating that $p < 0.05$, meaning there was a significant effect, so the alternative hypothesis (H_a) was accepted, and the null hypothesis (H_0) was rejected. Thus, there was a significant effect of sex education using flipping book media on adolescents' knowledge and attitudes regarding premarital sex.

Before receiving sex education via flipping book media, most adolescents were in the low knowledge category, with 57 students (63.3%). This low level of knowledge was likely due to the fact that the information they obtained came primarily from mass media, which they did not fully understand, as sexual education is not formally taught in schools (Amalina & Masyitoh, 2024). Low levels of health literacy cause adolescents to seek information from online sources that are not always credible (Sugiyani et al., 2025). Adolescents who obtain accurate information from valid sources such as books or health journals generally have a better understanding, and the use of flipping book media has been proven to be an effective educational tool to enhance adolescents' knowledge (Widyaningrum & Muhlisin, 2024). The use of flipping book media as an educational tool proved effective in improving adolescents' knowledge of sex education. After receiving sex education through flipping book media, most respondents showed a significant improvement, with 13 students (14.4%) categorized as having fair knowledge, and 77 students (85.6%) categorized as having good knowledge. Adequate knowledge accompanied by motivation to live a healthy adolescence encourages adolescents to maintain their health as a form of readiness for reproductively healthy family life (Septiasari et al., 2024). These findings are consistent with those of Fauziah (2024), who reported that media use is effective in increasing adolescents' understanding of the risks of free sex. Furthermore, interactive digital media such as flipping books enhance student engagement and comprehension, particularly in sensitive topics like reproductive health (Jamain et al., 2025). Educational interventions in the form of sexual education have been shown to strengthen adolescents' knowledge because they are more receptive and quick to process information (Lette et al., 2024). Similarly, other studies have confirmed that

the use of media in education can increase knowledge levels (Kusumawardani & Linggardini, 2025).

Several forms of sexual behavior commonly practiced by adolescents — such as holding hands, kissing (dry or deep), hugging, fantasizing, touching, masturbation, petting, and oral sex — fall under risky behaviors that may result in negative consequences (Saleh et al., 2025). Before being given premarital sex education through flipping book media at SMK Muhammadiyah Larangan, most adolescents demonstrated a positive attitude, with 89 students (98.9%) showing a positive attitude and only 1 student (1.01%) showing a negative attitude. After the intervention, there was a notable improvement, as all 90 students (100%) demonstrated a positive attitude toward premarital sex education. This result is supported by Ademuyiwa et al. (2023), who found that the majority of secondary school students in Southwest Nigeria possessed good knowledge of sex education and demonstrated positive attitudes toward it. Similarly, Basri et al. (2024) found a significant increase in positive attitudes toward premarital sex education, as posttest results showed an improvement from already positive pretest scores.

Numerous studies have demonstrated that sex education significantly enhances adolescents' knowledge and attitudes toward premarital sex. The use of educational media facilitates the delivery of information and serves as an effective learning strategy in modern education (Moto, 2019). One such medium, the flipping book, offers advantages by enhancing comprehension through its combination of text, images, and audio, while being portable and easily accessible via smartphones, thereby increasing student interest (Prihartini et al., 2024). The combination of visual and auditory learning elements in sex education flipping books activates long-term memory, making it

especially relevant for Gen Z, who favor visual-auditory learning styles (Thoriq, 2023). Flipping book-based sex education integrates digital technology, visually engaging content, and interactive as well as collaborative learning methods (Aisah, 2021). One of its key advantages lies in its ability to provide strong visualization, helping students clearly imagine real-life contexts through imagery and emotional appeal, thus making the learning process more engaging (Lestari & Setiawan, 2025). The implementation of structured health education plays an important role in shaping adolescents' preventive attitudes toward free sex (Siregar et al., 2023). Furthermore, continuous education is essential to ensure that adolescents receive accurate and up-to-date information (Isnaini & Purwito, 2019). The more information and knowledge adolescents possess regarding premarital sex education, the more likely they are to develop positive attitudes toward it (Arfiani et al., 2023).

However, this study has several limitations that may affect the completeness of the findings. First, the research was conducted in a single school with a relatively limited sample size and without the inclusion of a control group. Second, the flipping book media used in this study could only be accessed online and was not available offline. In addition, this study did not conduct long-term follow-up to assess the sustainability of changes in adolescents' knowledge and attitudes.

CONCLUSIONS AND RECOMMENDATION

Knowledge levels before and after sex education using flipping book media showed an improvement, with 1 respondent (1.01%) categorized as having good knowledge in the pretest, increasing to 77 respondents (85.56%) in the posttest. Similarly, attitudes before and after sex education using flipping book media also improved, with 89 respondents (98.89%) showing a positive attitude in the pretest

and 90 respondents (100%) in the posttest. These findings indicate that sex education using flipping book media has a significant effect on adolescents' knowledge and attitudes toward premarital sex.

This study is expected to enhance innovation in the use of flipping book media for sex education as a nursing intervention tool in adolescent reproductive health promotion programs. Future studies are recommended to use controlled designs by comparing the effects of flipping book media with other forms of digital educational media on adolescents regarding premarital sex, involve more diverse populations, and assess long-term effects.

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