

The Effectiveness of Animation Videos and Flashcard Games on Adolescent's Knowledge about Reproduction Health among Junior Highschool Students

Moh Arip^{1CA}, Aurora Amanda², Rusmini Rusmini³, Sahrir Ramadhan⁴

^{1,2,3,4}Jurusan Keperawatan, Poltekkes Kemenkes Mataram, Indonesia

Abstrak

Remaja menghadapi berbagai tantangan emosional dan sosial, termasuk isu-isu kesehatan reproduksi yang meningkat seperti perilaku seksual tanpa perlindungan, kehamilan tak terencana, dan penyakit menular seksual. Pengetahuan sebagian besar remaja tentang kesehatan reproduksi masih kurang memadai. Studi-studi menunjukkan bahwa penggunaan video animasi dan *game flash card* yang interaktif dan menarik dapat meningkatkan pengetahuan remaja. Penelitian ini bertujuan untuk menguji efektifitas video animasi dan *game flashcard* terhadap pengetahuan tentang kesehatan reproduksi remaja pada siswa Sekolah Menengah Pertama Negeri 2 Batu Layar. Metode penelitian yang digunakan adalah eksperimen semu dengan pendekatan *non equivalent two groups design* terhadap 51 responden dengan Teknik pengambilan sampel *proportionate random sampling*. Video animasi dan *game flash card* diberikan sebanyak 3 kali pertemuan dalam seminggu. Pengumpulan data pengetahuan menggunakan kuesioner, dianalisis menggunakan *Wilcoxon Signed Rank Test* dengan tingkat signifikansi 95% ($\alpha = 0.05$). Sebelum intervensi, responden mempunyai pengetahuan yang cukup tentang kesehatan sistem reproduksi remaja, dengan 14 responden (54%) pada video animasi dan 10 responden (40%) pada *game flash card* yang berada dalam kategori kurang. Setelah pemberian video animasi, sebagian besar responden, yaitu 14 orang (54%), mencapai kategori pengetahuan yang baik. Sementara itu, setelah penggunaan *game flash card*, didapatkan hasil 22 responden (88%) mencapai kategori pengetahuan yang baik. Ada perbedaan efektifitas video animasi dan *game flash card* terhadap peningkatan pengetahuan tentang kesehatan sistem reproduksi remaja. Peneliti selanjutnya diharapkan dapat mengeksplorasi dan mengembangkan metode pendidikan yang lebih beragam dan menarik untuk topik kesehatan sistem reproduksi.

Kata Kunci : Sistem reproduksi; Remaja; Video animasi; *Game Flash Card*; Pengetahuan

Abstract

Adolescents face various emotional and social challenges, including increasing Reproduction health issues such as unprotected sexual behavior, unplanned pregnancy, and sexually transmitted diseases. Most adolescents' knowledge about Reproduction health is still inadequate. Studies show that the use of interactive and interesting animated videos and flash card games can improve adolescent knowledge. This study aims to test the effectiveness of animated videos and flash card games on adolescent Reproduction health knowledge in students of State Junior High School 2 Batu Layar. The research method used was a quasi-experimental approach with a non-equivalent two groups design on 51 respondents with a proportionate random sampling technique. Animated videos and flash card games were given 3 times a week. Data collection of knowledge using questionnaires, analyzed using the Wilcoxon Signed Rank Test with a significance level of 95% ($\alpha = 0.05$). Before the intervention, respondents had sufficient knowledge about adolescent Reproduction health, with 14 respondents (54%) in the animated video and 10 respondents (40%) in the flash card game being in the poor category. After being given the animated video, most respondents, namely 14 people (54%), achieved a good knowledge

category. Meanwhile, after using the flash card game, the results showed that 22 respondents (88%) achieved a good knowledge category. There is a difference in the effectiveness of animated videos and flash card games on increasing knowledge about adolescent Reproduction health. Further researchers are expected to explore and develop more diverse and interesting educational methods for the topic of Reproduction health.

Keywords: *Reproduction health; Adolescents; Animation videos; Flashcard games; Knowledge*

INTRODUCTION

The teenage years are a transitional period from childhood to adulthood. During this phase, adolescents often aren't fully mature mentally and socially, leading them to face various emotional and social challenges. Throughout puberty, teenagers undergo significant physical changes, including the development of Reproduction capabilities (Ernawati, 2018). According to Pinem (2009) as cited in Marlina et al. (2021), Reproduction health refers to the overall well-being, encompassing physical, mental, and social aspects, and not solely being free from diseases or disabilities, which are related to the Reproduction system and its functions along with its processes (Marlina et al., 2021).

Cases related to reproduction among teenagers are currently on the rise, often associated with their lack of understanding of relevant Reproduction aspects. Some social and clinical health issues that garner attention and can jeopardize Reproduction health include unprotected sexual behavior, unplanned pregnancies, abortions, sexually transmitted infections (STIs), HIV/AIDS, gender-based violence, substance abuse, and a lack of information about Reproduction health among teenagers (Rosamali & Arisjulyanto, 2020).

The population of adolescents aged 10-19 years old accounts for over 16% of the world's population. Out of this figure, the incidence of unprotected sex worldwide reaches 43.1% (WHO, 2020). Dr. Boyke Dian Nugraha, an expert in sexual health and Obstetrics and Gynecology specialist practicing in Jakarta, stated that approximately 20% to 30% of teenagers admit to having engaged in sexual intercourse (Safitri & Kurnaesih, 2022). The research conducted by Safitri & Kurnaesih (2022) titled "Perceptions of Casual Sex among Adolescents in Bima City, West Nusa Tenggara, Indonesia" revealed that 44% of adolescents openly stated that they have engaged in sexual intercourse, with the first sexual experience typically occurring between the ages of 16 to 18 years old. Meanwhile, approximately 16% of them initiated sexual relationships between the ages of 13 to 15 years old.

In 2020, the number of child marriages in West Nusa Tenggara (NTB) was reported to be 805 cases. The data from highest to lowest in each area are as follows: Bima with 235 cases, Central Lombok with 148 cases, West Lombok with 135 cases, Dompu with 128 cases, Sumbawa with 117 cases, East Lombok with 43 cases, Taliwang with 16 cases, and Mataram with 8 cases. West Lombok ranks third in the highest number of child marriages in NTB (Dewi et al., 2022). Based on the data from the West Lombok Health Office, there are 123,940 adolescents in West Lombok. The number of premarital sex cases in West Lombok from 2021 to 2022 is 136 cases. According to data from the Meninting Community Health Center, there are 8,768 adolescents in the Batu Layar District as of October 2023. In 2022, around 5 adolescents in middle school were recorded as having sexually transmitted diseases.

This number increased in 2023, with approximately 7 cases reported from January to November (Puskesmas Meninting, 2023).

In the period from January to December 2022, there were 37 cases of teenage pregnancies (<18 years old). The latest data as of January to October 2023 recorded 34 cases of teenage pregnancies in the Batu Layar District. It's possible that this data will increase by December 2023. As of October 2023, there were 2 cases of premarital sex, whereas there were no records of premarital sexual behavior in the Meninting Community Health Center area in 2022 (Puskesmas Meninting, 2023).

The issues faced by teenagers regarding Reproduction health knowledge are currently quite complex. This is evidenced by data from the 2018 Indonesian Demographic and Health Survey (SDKI) Key Results Report (KRR), which indicates that teenagers' knowledge about Reproduction health is still insufficient. Only about 35.3% of adolescent girls and 31.2% of adolescent boys aged 15-19 are aware that a woman can become pregnant from just one instance of sexual intercourse (BKKBN, 2018). The lack of understanding about Reproduction health can result in Reproduction health issues among teenagers. They often face issues such as sexually transmitted infections including HIV/AIDS, teenage pregnancy, unintended pregnancies, risky abortions, early marriage, sexual violence, and promiscuous behavior. The main concern is that teenagers at this age often lack the life skills necessary to avoid sex before marriage. This frequently occurs due to their limited knowledge about Reproduction health, which can lead them to engage in harmful behaviors (Yunika et al., 2022). Having adequate knowledge about Reproduction health is crucial. Without this knowledge, individuals may overlook aspects of Reproduction health, which can pose risks to themselves.

An initial study conducted at SMPN 2 Batu Layar indicates a lack of specific efforts to address issues regarding Reproduction health. Education related to Reproduction health is only obtained through biology and religious studies, which are not sufficient to educate its students adequately. The school has also never received any socialization or education on adolescent Reproduction health from experts and specialists before. Several studies indicated that audiovisual media, which combine sound and visuals, are more effective in enhancing knowledge and have a longer-lasting impact on memory compared to written, audio-only, or visual-only media. Increasingly, videos, especially those featuring engaging characters in animation, have proven to be more captivating and effective in enhancing knowledge. Studies also indicate that the use of videos in health education can improve understanding more than simulation methods (Aisah et al., 2021).

Limbun's study (2019) indicates that health education has a positive impact on knowledge enhancement. Engaging and interactive delivery methods contribute to active involvement among teenagers, prevent boredom, and maximize information uptake. The use of dynamic images and audiovisual aids proves effective as teenagers tend to mimic and be inspired by what they see (Asrianna et al., 2022). In a study conducted by Adawiyani (2013), it was found that the use of supporting media such as flashcards greatly assists in enhancing the effectiveness of health education. Flashcards rich in health information can facilitate the health counseling process (Kusuma et al., 2022). This study aimed

to identify the effectiveness of animated videos and flash card games on improving knowledge about adolescent reproduction health among students of state junior high school 2 Batu Layar.

METHOD

This study employs a quasi-experimental design using the nonequivalent two groups design approach. In this design, the first group, which serves as the intervention group, will be given a specific treatment (X1) followed by pretest and posttest measurements. The results of these measurements will then be compared with the second group, which also receives a different treatment (X2), with pretest and posttest measurements conducted before and after the intervention. The study was conducted over 3 days, with the treatment groups divided into 2 groups. The first group was given the treatment of Animation Videos, and the second group was given the treatment of Flashcard Games. On the first day, a pre-test questionnaire consisting of 10 true/false questions was administered. After completing the questionnaire, the first group received the Animation Videos treatment, while the second group received the Flashcard Games treatment. On the second day, the treatments were continued, and on the third day, an evaluation was conducted by distributing the same pre-test questions as a post-test questionnaire.

The sampling method chosen is Probability sampling with a Proportionate random sampling approach, involving a total of 51 students from SMPN 2 Batu Layar. The number of samples refers to the number of individuals or elements selected from the total research objects that are considered to represent the entire population. To determine the sample size in this study, calculations were conducted using the Lynch formula. Data collection for characteristics of respondent such as class and gender, also knowledge before and after the treatment is done using an Adolescent Reproduction Health Questionnaire. After consenting to participate, all respondents receive a questionnaire containing 10 true/false questions. with results categorized as good (76% – 100%), sufficient (56% – 75%), and poor (<56%) (Arikunto, 2017). Univariate data analysis on respondent characteristics and bivariate data analysis using the Wilcoxon Signed Rank test to assess students' knowledge level regarding Reproduction health systems.

RESULT

Table 1. Respondents Based on Grade, and Gender

No	Characteristics	Animation Videos		Flash Card Game	
		Frequency	Percentage (%)	Frequency	Percentage (%)
1.	Class				
	7	10	39	9	36
	8	7	30	6	24
	9	9	31	10	40
2	Gender				
	Male	14	54	13	52
	Female	12	46	12	48
	Total	26	100	25	100

Based on Table 1, in the animated video group, there were 10 students in grade 7 (39%), 7 students in grade 8 (30%), and 9 students in grade 9 (31%). For the flash card game, there were 9 students in grade 7 (36%), 6 students in grade 8 (24%), and 10 students in grade 9 (40%). Based on gender, the majority of respondents for the animated video were male, with 14 respondents (54%), while females were 12 respondents (46%). In the flash card game group, there were 13 male respondents (52%) and 12 female respondents (48%).

Table 2. Respondents' knowledge, before and after receiving intervention of Animated Video

No.	Category	Before Intervention		After Intervention	
		n	%	n	%
1.	Poor	9	34	4	15
2.	Sufficient	14	54	8	31
3.	Good	3	12	14	54

Based on Table 2, there is an influence of animated video on increasing knowledge about adolescent Reproduction health among students of SMPN 2 Batu Layar. Before being given the animated video, respondents were categorized as poor knowledge by 9 individuals (34%), sufficient by 14 individuals (54%), and good by 3 individuals (12%). After being given the animated video, there was a change in the number of respondents in the poor knowledge category to 4 individuals (15%), sufficient to 8 individuals (31%), and good to 14 individuals (54%).

Table 3. Results of Wilcoxon Signed ranked test on the Knowledge of Animated video group

No	Intervention Group	Min	Max	Mean	Deviation Standard	P Value
1.	Pre-test Animated Video	20	90	59.23	16.229	
2.	Post-test Animated Video	40	100	74.23	16.043	0.004

Table 3 showed the non-parametric Wilcoxon Sign Rank Test conducted using SPSS 23, with a significance level of $\alpha = 0.05$, yielded a value of $\rho = 0.004 < 0.05$. This indicates that there is a significant influence of the animated video in increasing knowledge of students about adolescent reproduction health.

Table 4. Respondents' knowledge, before and after receiving intervention of Flashcard game

No.	Category	Before Intervention		After Intervention	
		n	%	n	%
1.	Poor	10	40	0	0
2.	Sufficient	8	32	3	12
3.	Good	7	28	22	88

Based on Table 4, there is an influence of the flash card game on increasing knowledge about adolescent Reproduction health among students of SMPN 2 Batu Layar. Before being given the flash card game, respondents were categorized as poor knowledge by 10 individuals (40%), sufficient by 8

individuals (32%), and good by 7 individuals (28%). After being given the flash card game, there was a change in the number of respondents in the poor knowledge category to 0 individuals (0%), sufficient to 3 individuals (12%), and good to 22 individuals (88%).

Tabel 5. Non-Parametric Statistical Test: Wilcoxon Sign Rank Test on the Influence of

No	Treatment Group	Minimal	Maximal	Mean	Standard Deviation	P Value
1.	<i>Pre-test flash card Game</i>	40	90	62.80	16.462	0.000
2.	<i>Post-test flash card Game</i>	60	100	84.80	10.050	

Based on Table 5, the results of the non-parametric Wilcoxon Sign Rank Test conducted through SPSS 23, with a significance level of $\alpha = 0.05$, yielded a value of $\rho = 0.000 < 0.05$. This indicates that there is a significant influence of using the flash card game on increasing knowledge among students of SMPN 2 Batu Layar regarding adolescent Reproduction health in 2024.

Table 6. Analysis of the Effectiveness of Animation Videos and Game Flash Cards on Improving Knowledge about Adolescent Reproduction Health at SMPN 2 Batu Layar in 2024.

No	Treatment Group	Sig. ρ of Wilcoxon	Sig. ρ of Mann Whitney
1.	<i>Animated Video</i>	0.004	0.014
2.	<i>Game flash card</i>	0.000	

Based on Table 6, the results of the Mann-Whitney statistical test showed a ρ value of 0.014 < 0.05 . This indicates a significant difference in effectiveness between Animated Video and Flash Card Game in increasing knowledge about adolescent Reproduction health at SMPN 2 Batu Layar in 2024. Based on the Wilcoxon test conducted, the ρ value for the animated video was 0.004, while the ρ value for the flash card game was 0.000. From these results, the ρ value for the flash card game is smaller than that of the animated video, which is $0.000 < 0.004$, suggesting that the flash card game is more effective than the animated video.

DISSCUSION

A. Knowledge Before Being Given Animated Video and Flash Card Game

The results of the study conducted at SMPN 2 Batu Layar on 26 respondents who were intervened using animated video showed that 9 respondents had a low level of knowledge (34%), 14 respondents had sufficient knowledge (54%), and only 3 respondents had good knowledge (12%). For the flash card game activity with 25 respondents, the results showed that 10 respondents were in

the poor category (40%), 8 respondents were in the sufficient category (32%), and 7 respondents were in the good category (28%).

According to Notoatmodjo (2018), several factors contribute to an individual's level of knowledge, including age, education, occupation, experience, and access to information. Age has a strong correlation with knowledge; as one grows older, they tend to acquire more knowledge. The respondents' ages in this study range from 10 to 18 years old, with the students of SMPN 2 Batu Layar falling within the range of 14 to 16 years old. At this age range, knowledge obtained is still very minimal, so the pre-test results for knowledge levels are predominantly categorized as sufficient and poor.

According to Notoatmodjo (2018), as one's level of education advances, their human capital increases, which includes knowledge and skills. Meanwhile, the respondents' education level in this study is still at the junior high school level. In the pre-test results, it was found that there were only 3 respondents (12%) categorized as having good knowledge for the animated video, and only 7 respondents (28%) for the flash card game. This could be due to the fact that the level of education in junior high school (SMP) still results in respondents having minimal knowledge. Another influencing factor on an individual's knowledge is gender. According to a study titled "The Relationship between Gender and Age with Adolescents' Knowledge of HIV/AIDS at SMAN 3 Atambua East Nusa Tenggara 2018," it was found that adolescent girls generally have a better understanding of HIV/AIDS compared to adolescent boys. This may be because adolescent girls have more opportunities to read or discuss HIV/AIDS with their peers. (Berek et al., 2019).

Based on the results of the research before being given the animated video and flash card game, it was found that the knowledge category of the respondents was predominantly sufficient and poor, where the gender of the respondents for the animated video was dominated by males with 14 individuals (54%), and for the flash card game was also dominated by males with 13 individuals (52%).

These findings are consistent with a study conducted by Berek et al. (2019), which found that males generally have lower levels of knowledge. In the research conducted, it was found that the scores of female students tended to be higher than those of male students, both in the pre-test and post-test. Based on the research findings, the age of the students at SMPN 2 Batu Layar ranges from 14 to 16 years old, which is still an age of adolescence characterized by learning and gaining experiences, hence the pre-test results of these students predominantly fall into the sufficient category.

B. The Influence of Animated Video on Increasing Knowledge about Adolescent Reproduction Health among Students of SMPN 2 Batu Layar in 2024.

The research results indicate that the use of animated videos has a positive impact on the knowledge of students at SMPN 2 Batu Layar regarding adolescent Reproduction health in 2024. Through the Wilcoxon Sign Rank Test statistical analysis using SPSS 23, it was found that there is

a significant increase in knowledge with a value of $\rho = 0.004 < 0.05$. This indicates that animated videos are effective in enhancing students' knowledge.

Similar research by Kusmaryati (2022) also supports these findings, where after the intervention with instructional videos, 28 students showed an increase in knowledge, 5 students showed no change, and 2 students experienced a decrease. With a ρ -value of 0.000 (< 0.005), the analysis statistically indicates a significant difference in students' knowledge before and after the intervention (Kusmaryati et al., 2022).

Based on the results of the conducted research, it was found that there was a change in the post-test results of students who were given the animated video intervention. According to the author, the visuals, audio, and all components in the animated video were engaging enough to capture the respondents' attention. This is evidenced by the respondents who fully engaged with the displayed animated video and were able to remember some of the information conveyed through the animation. Through the colorful and appealing visuals, it can be said that the animated video successfully captivated the respondents' attention and made it easy for them to recall the information the author intended to convey regarding adolescent Reproduction health.

C. The Influence of Flash Card Game on Increasing Knowledge about Adolescent Reproduction Health among Students of SMPN 2 Batu Layar in 2024.

Based on the research results, the non-parametric statistical analysis, namely the Wilcoxon Sign Rank Test using SPSS 23 computerized system, for the influence of flash card game on knowledge enhancement with standard deviation analysis of 10.050 yielded a score scale of knowledge enhancement with a value of $\rho = 0.000 < 0.05$. This indicates that there is an influence of flash card game on increasing knowledge about adolescent Reproduction health among students of SMPN 2 Batu Layar in 2024.

The study by Muntaza et al. (2023), titled "The Relationship of Health Education Through Flash Card Media on Students' Knowledge and Attitudes Towards Sexuality Issues in SMP Darussalam District Banda Aceh," found that health education using flash card media increased students' knowledge and attitudes towards sexuality issues in SMP Darussalam District Banda Aceh, with a p -value of 0.001 after the treatment. The learning process involving auditory and visual senses contributes to knowledge and skills enhancement. Effective Reproduction health education can result in positive attitudes. Learning media, such as flash cards, which display a combination of engaging images and text, facilitate students in receiving and remembering information. Flash cards, thin cards with illustrations and text, are proven suitable for adolescents due to the ease of remembering presented material (Safithri et al., 2022) in (Muntaza et al., 2023).

Based on the results of the conducted research, it was found that there was a change in the post-test results of students who were given the flash card game intervention. According to the author, the visual presentation, non-monotonous fonts, flash card size that is not too small like most

flash cards, and all components in the flash card game were engaging enough to capture the respondents' attention. This is evidenced by the respondents who were very enthusiastic about participating in the series of flash card games that were prepared, and of course, were able to remember some of the material presented in the flash card game. Through the colorful and appealing visuals, along with the ideal flash card format, it can be said that the flash card game successfully captivated the respondents' attention and made it easy for them to remember the information the author intended to convey regarding adolescent Reproduction health.

D. The Effectiveness of Animated Video and Flash Card Game on Increasing Knowledge about Adolescent Reproduction Health among Students of SMPN 2 Batu Layar in 2024.

The research results indicate that statistical analysis using the Mann-Whitney test yielded $\rho < \alpha = 0.05$, which means that there is a difference in the effectiveness of Animated Video and Flash Card Game on increasing knowledge about Adolescent Reproduction Health among Students of SMPN 2 Batu Layar in 2024. The research findings indicate that the Flash Card Game is more effective than animated video in increasing knowledge. Based on the Mann-Whitney test, it was found that the average knowledge score from using the Flash Card Game is higher. The statistics show a ρ -value of 0.014 or $\rho < 0.05$, indicating a significant difference in knowledge between the two methods, with the Flash Card Game having a higher knowledge score.

Rohqiati's research (2023) supports the idea that utilizing various senses in learning enhances acquired knowledge. Flash cards, relying on visual aids and combining text with images, may be more effective than animated videos in educating adolescents as they facilitate comprehension and retention of material (Rohqiati et al., 2023). The study by Muntaza et al. (2023) indicates that flash cards are an effective informational tool, with images as the main element that captivates attention. The use of engaging images in flash cards not only enriches the learning experience by engaging multiple senses but also enhances information absorption. Information conveyed effectively through flash cards contributes to knowledge enhancement. Due to their ability to spark interest and facilitate memory, flash cards are considered more effective than other methods. Health education using flash cards has been shown to have a significant impact on increasing respondents' knowledge.

This study aligns with research conducted by Putri (2018) titled "The Effect of Flash Card Games on Cognitive Development in Preschool Children." The study demonstrates that flash card games can enhance cognitive development in children. This method represents a novel learning approach that incorporates learning through play. Flash cards contain images, symbols, and words, stimulating cognitive development in children. Additionally, according to Glenn Doman (2009) cited in Putri (2020), the right brain's ability to remember things and the child's level of concentration will increase when using the flash card game method due to the colorful presentation of images and words on the flashcards (Putri, 2018).

Based on the results of the conducted research, there is a difference in effectiveness between the activities of video animation and game flash cards. Game flash cards are more effective compared to video animation. This statement could be attributed not only to the post-test results of both interventions but also to the more prominent attraction of game flash cards due to the gaming activities engaged by the respondents. The respondents are very pleased and enthusiastic about the games provided, thus they do not get bored quickly while learning about adolescent Reproduction system health. In contrast, the 7-minute animation video, not accompanied by any activities and only repeating the video playback, feels monotonous and may make some respondents bored. Based on these factors, the result indicates that game flash cards are more effective than video animation.

CONCLUSION

Based on the research findings, it can be concluded that both video animation and game flash cards are effective in improving the knowledge of Adolescent Reproduction Health among students of SMPN 2 Batu Layar in 2024. There is a difference in the effectiveness of video animation and game flash cards in improving the knowledge of Adolescent Reproduction Health among students of SMPN 2 Batu Layar in 2024, with game flash cards being rated as more effective than video animation.

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