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Effectiveness of Animated Video-Based Health Education on Adolescent Knowledge of HIV/AIDS at SMA Negeri 15 Semarang

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ABSTRACT

HIV/AIDS is an infectious disease with a high risk of transmission among adolescents, primarily due to limited knowledge and lack of accurate information. One effective strategy to address this issue is through health education, particularly using engaging media such as animated videos to enhance delivery and retention. This study aimed to determine the effect of health education using animated video media on increasing adolescent knowledge about HIV/AIDS. The research employed a quasi-experimental design with a one-group pretest-posttest approach. A total of 40 adolescents participated and received an intervention in the form of education through animated video. Data were collected using a structured questionnaire with 30 multiple-choice items administered before and after the intervention. Based on the results, before the health education intervention using animated video media, most respondents (25 people or 62.5%) were in the good knowledge category, 12 respondents (30%) were in the sufficient category, and 3 respondents (7.5%) were in the lacking category. After the intervention, all respondents (100%) were in the good knowledge category, with no respondents in the sufficient or lacking categories. The statistical test showed Z = -4.939 and p = 0.000 (p < 0.05), indicating a significant difference. Health education using animated video media is effective in increasing adolescent knowledge about HIV/AIDS.

Keywords: Animated Video, Adolescents, Knowledge, HIV/AIDS

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INTRODUCTION

HIV (Human Immunodeficiency Virus) a virus that attacks the immune system, sufferers will experience decreased immunity so that it is very easy to be infected with various other diseases. AIDS (Acquired Immuno Deficiency Syndrome) a group of symptoms of reduced self-defense ability caused by the entry of the HIV virus. People with HIV/AIDS are called ODHA (Imelda, 2020; Kemenkes, 2019; Martilova, 2020; Ovany et al., 2020).

HIV/AIDS disease continues to grow and become a global problem that has hit the world, including in Indonesia. The number of HIV and AIDS cases in Indonesia has also been reported to have continued to increase cumulatively from 2005 to 2021. As of March 2021, 427,201 people were infected with HIV in Indonesia, representing 78.7% of the target of 90% of new cases. Meanwhile, the number of people living with AIDS from 1987 to March 2021 has reached 131,147. The number of newly infected HIV cases in Indonesia continues to increase, as seen from previous data. New HIV infections (new HIV cases) were 859 in 2005, 21,591 in 2010, 30,935 in 2015, and 41,987 in 2020 (Dirjen P2P, 2021).

According to Nurlinda (2023), HIV/AIDS prevention which is a world program is very urgent in efforts to promote clean and healthy living behavior. These include sexual abstinence before marriage or loyalty to one partner, continuous use of condoms every time you have sex, avoiding the use of injected drugs, and ensuring that you get correct and accurate information about HIV/AIDS from trusted sources.

In Central Java, the highest HIV/AIDS rate is in Semarang City. The spread of HIV/AIDS in Semarang City is very concerning. The Semarang City Health Office detected at least hundreds of new cases throughout the year. Information from the Semarang City Health Office states that the total number of HIV/AIDS sufferers in Semarang City is 5,228 people, and an average of 500 new sufferers each year. One of the HIV/AIDS cases with a total of 168 HIV/AIDS cases and is the sub-district with the highest HIV rate in Semarang (Mujoko et al., 2021).

Citing data revealed by the Head of Disease Prevention and Control of the Central Java Health Service, Rahmah Nur Hayati, the number is data from January to June 2022. That Semarang City has 181 cases, Grobogan 123 cases, Blora 87 cases, and Demak 67 cases of HIV (Yusuf, Muchammad Dafi, 2022). Even from his research, Kumaladewi (2025) stated that Semarang City is the area with the highest

number of new HIV/AIDS cases in Central Java. As from his report, in 2022-2023 new HIV findings in Semarang City increased, namely to 34% (661 cases) and 4% (495 cases).

Lack of knowledge and information about this disease can affect adolescents at risk of problems about this. Therefore, one way to prevent it is by increasing adolescent knowledge about HIV/AIDS. Including efforts to overcome HIV/AIDS can be done by utilizing ICT (Information and Communication Technology) which is currently growing. The potential to utilize technology for health, especially to overcome the spread of HIV/AIDS, is quite large. Indonesian society, including young people, is accustomed to not being separated from their cellphones, so it will be easy to get new information related to HIV/AIDS via Android (Karyaningtyas et al., 2020; Silaban et al., 2024).

According to Humaira (2022) and also Qosim (2022) high school is a transition period from adolescence to adulthood, so it is very easy for the influence and curiosity to be very high to try negative things such as smoking, drinking alcohol, drugs and even free sex. and all of that can cause several disease problems, especially HIV / AIDS which is very prone to occur in adolescents, so researchers want to provide knowledge about what HIV / AIDS is by showing animated videos. The rampant transmission of HIV / AIDS in society, especially in adolescents, is due to free association and the use of injection needles. This is due to a lack of knowledge about HIV / AIDS.

In line with that, according to Nurlinda (2023) who quoted Sarwono (2015) that adolescence is a productive age that is very vulnerable to contracting HIV-AIDS, because when teenagers experience high sexual urges and always seek information about sex, and the knowledge and information related to reproductive health that they get is very lacking. Therefore, teenagers generally prefer to seek various sources of information that they can obtain, such as gathering with peers, accessing books about sex, accessing adult sites on the internet, trying masturbation, making out or even having sex with their boyfriends.

Given the high number of HIV/AIDS cases and the vulnerability of adolescents to engaging in risky behavior due to lack of knowledge, an effective, attractive educational strategy is needed that is in accordance with the characteristics of today's digital generation.

Health education plays a very important role in increasing adolescent knowledge and attitudes towards HIV-AIDS prevention. Good awareness and

knowledge of HIV-AIDS and positive attitudes are very important for HIV-AIDS prevention (Zhang et al., 2022).

Research by Nurlindawati indicates that health education in the form of counseling about HIV/AIDS for adolescents is crucial because the incidence of HIV/AIDS worldwide increases annually (Nurlindawati, 2023).

Research by Elfika et al. indicates a significant increase in knowledge levels after health education. Before the intervention, the majority of respondents (75%) had poor knowledge, while after the intervention, the majority (74.2%) were in the good knowledge category. The paired t-test showed a significance value of $p = 0.000$ ($p < 0.05$), indicating a significant difference between before and after the intervention (Elfika et al., 2024).

The results of Kusnan et al.'s (2020) study showed that counseling could influence students' knowledge and attitudes about HIV/AIDS with ($p = 0.000$). Likewise, Wahyuni's (2024) study showed that knowledge before and after being given health promotion through audiovisual media about HIV/AIDS in the experimental group showed a p value (0.000). From the above, the use of audiovisual media, such as animated videos, is an alternative in conveying health information because it is visual, communicative, and easily accessible through digital devices that are familiar to teenagers.

Most previous educational efforts for adolescents have used conventional methods such as lectures or printed materials, which tend to be less attractive and have limited impact on knowledge retention. Although audiovisual media have been introduced, there is still little research specifically examining animated video as a medium for HIV/AIDS health education among Indonesian adolescents. Animated videos provide stronger visual appeal, storytelling, and motion elements that can increase understanding and memory retention compared to static or text-based media. This research therefore fills that gap.

Therefore, this study was conducted to determine the effect of health education using animated video media on increasing adolescent knowledge about HIV/AIDS, addressing the limited evidence on the use of animated videos compared to other media, as one of the promotive and preventive efforts that contribute to controlling the spread of HIV/AIDS among young people.

METHOD

This study was conducted in April–May 2025 with a quasi-experimental research type using a one group pretest and posttest

design approach. The sampling technique used purposive sampling, which is a type of non-probability sampling, In this study, there was one group of adolescents who were given an intervention in the form of health education about HIV/AIDS using animated video media. Before the intervention was given, a pretest was conducted to determine the level of initial knowledge of adolescents. After that, education was given through playing an animated video with a duration of ± 7 minutes, which covered the following topics: (a) the definition of HIV/AIDS, (b) clinical symptoms, (c) modes of transmission, (d) prevention, and (e) treatment of HIV/AIDS. Afterwards a posttest was conducted to determine changes in knowledge scores following the intervention.

This study involved 40 teenagers as respondents at SMA Negeri 15 Semarang. Data were analyzed using SPSS for Windows. Before conducting the hypothesis test, the Kolmogorov-Smirnov normality test was first conducted. Data that were not normally distributed were presented using the median, minimum and maximum values, while data that were normally distributed were presented in the form of mean and standard deviation. To determine the difference in knowledge scores before and after the intervention, the Wilcoxon Signed Rank Test was used as a non-parametric test for paired data.

This research has obtained ethical approval from the Health Research Ethics Commission of the Semarang Ministry of Health Polytechnic with Number: 683/EA/F.XXIII.38/2025.

RESULTS AND DISCUSSIONS

Results

The sample in this study was an intervention group consisting of 40 adolescents of SMAN 15 Semarang. The frequency distribution of respondent characteristics is as follows.

Table 1. Table Respondent Characteristics

Respondent Characteristics	Frequency **(n=40)**	Presentation **(100%)**
Gender		
Male	13	33,5%
Female	27	67,5%
Age – Early Teens		
16	2	5,0%
17	37	92,5%
18	1	2,5%

Source: ***Primary Data 2025***

In table 1, it can be seen that there are 40 respondents with the largest age range being 17 years old as many as 37 people (92.5%). Based on gender, most of the respondents were women as many as 27 people (67.5%). Most of the respondents

have never received comprehensive education about HIV/AIDS, either through conventional or digital media, so an interesting educational approach is needed that is in accordance with the characteristics of adolescent age, such as through animated video media.

Table 2. Knowledge Value Before and After Health Education Based on Animated Video Media

Variable	Knowledge			
	Lowest value	The highest score	Median	Mean ± SD
Before	57,00	93,00	78,43	78,43 ±8,68
After	77,00	97,00	88,02	88,02 ± 5,87

Source: ***Primary Data 2025***

Based on the results of univariate analysis, before being given animated video media-based health education intervention, the adolescents' knowledge scores showed the lowest score of 57.00 and the highest score of 93.00, with a median of 78.43, and an average (mean) of 78.43 and a standard deviation of 8.68.

Table 3. Frequency Distribution of Knowledge Categories of Respondents Before the Animated Video Health Education Intervention

Category	Knowledge Level	Before	n=40	%
Good	>76%		25	62,5%
Enough	56– 76%		12	30%
Not enough	< 56%		3	7,5%
Total			40	100%

Source: Primary Data 2025

Based on Table 3, before being given a health education intervention using animated video media, most respondents (25 people or 62.5%) were in the good knowledge category, 12 respondents (30%) were in the sufficient category, and 3 respondents (7.5%) were in the lacking category.

After the intervention, namely by providing health education through animated video media about HIV/AIDS, all respondents (100%) were in the good knowledge category, and there were no respondents in the sufficient or lacking categories. This shows a marked increase in adolescents' knowledge about HIV/AIDS after the intervention.

The grouping of knowledge categories is based on the classification proposed by Arikunto (2013), namely: good if the value is ≥ 76%, sufficient if the value is 56–75%, lacking if the value is ≤ 55%.

Table 4. Frequency Distribution of Respondents' Knowledge Categories After the Animated Video Health Education Intervention

Category	The Value of Knowledge	Before	n=40	%
Good	>76%		40	100%
Enough	56– 76%		0	0%
Not Enough	< 56%		0	0%
Total			40	100%

Source: ***Primary Data 2025***

The results of the statistical analysis of descriptive data on the value of adolescent knowledge after being given a health education intervention based on animated video media about HIV/AIDS showed that all respondents, namely 40 people (100%), had a level of knowledge in the good category. There were no respondents with knowledge in the sufficient or insufficient category.

This shows that educational intervention using animated video media is very effective in improving adolescent knowledge about HIV/AIDS as a whole. This increase is in line with the knowledge level category according to Arikunto (2013), where a value of ≥ 76% is categorized as good.

The data normality test in this study was calculated using Shapiro-Wilk because the number of samples was <50. The data is said to be normally distributed if the significance value (Pvalue) > 0.05. The results of the normality test can be seen in the following table:

Table 5. Shapiro-Wilk Data Normality Test

Groub		P Value	Conclusion
Intervention	Pre-test	0,198	Normally Distributed
	Post test	0,018	Not Normally Distributed

Source: ***Primary Data 2025***

Based on the data normality test using Shapiro-Wilk, it was found that the intervention group had pre-test and post-test results that were smaller than α (0.05) so that it was stated that the data was not normally distributed. Therefore, the Wilcoxon alternative test was used.

Table 6. Wilcoxon Knowledge Test Statistical Results

Test Statistik	**Nilai *p***
Z	-4,939
Asymp. Sig. (2-tailed)	,000

Source: ***Primary Data 2025***

The test results show that the Z statistic value is -4.939, with a significance value of Asymp. Sig. (2-tailed) of 0.000. Because the significance value is smaller than the significance level of 0.05 ($p < 0.05$), it can be concluded that there is a significant difference between the knowledge value before and after being given education.

Thus, intervention in the form of animated video media-based health education has proven effective in increasing adolescent knowledge about HIV/AIDS. The majority of respondents experienced an increase in value, indicating that the use of animated visual media can be a powerful educational strategy in delivering health information among adolescents.

Discussion

Based on the research data, before being given education through animated video media, most students were in the good knowledge category, namely 25 respondents (62.5%), while 12 respondents (30%) were in the sufficient category and 3 respondents (7.5%) were in the lacking category. After being given a health education intervention based on animated video media about HIV/AIDS, all respondents (100%) were in the good knowledge category, and there were no respondents in the sufficient or lacking categories.

These data show that health education interventions with animated video media have a positive impact on increasing adolescent knowledge about HIV/AIDS. Changes in the distribution of categories from the majority in the less category to the majority in the good category reinforce that animated video media is effective in conveying information that is easily understood by adolescents. Animated videos are a learning medium to provide the ability to visualize material that students cannot see or imagine (Alifia & Hendriana, 2021; Gae et al., 2021).

Animated video learning media makes it easier to provide information in delivering material, with the advantage of being able to increase the effectiveness and speed in delivering material by 30%, the ability to make abstract objects or materials into concrete ones with the aim of increasing the knowledge of the recipient of the information (Mariana et al., 2025; Putri et al., 2023)

Adolescent knowledge before being given animated video-based health education about HIV/AIDS at SMAN 15 Semarang showed that most respondents had a low level of knowledge, namely 25 people (62.5%). This indicates that before being given the intervention, there were still

many students who did not fully understand about HIV/AIDS prevention.

These results are in line with research by Anggraini et al. (2022), which states that health education has an important role in changing a person's knowledge and attitudes in making health-related decisions. The age of respondents who are in adolescence shows that they have entered an active phase of cognitive and social development, where they begin to be open to various new information but are also very vulnerable to environmental influences.

Lack of knowledge during this period can be a risk factor for risky behavior, including behavior related to HIV/AIDS transmission. Therefore, educational interventions through media that are appropriate to the characteristics of adolescents such as animated videos are considered very appropriate and effective.

After being given intervention in the form of health education based on animated video media about HIV/AIDS, there was a significant increase in knowledge among adolescents. This is indicated by the increasing number of respondents who have a good level of knowledge, which is 29 students (72.5%). This increase is thought to be because during the education process, students showed high attention and enthusiasm for the material presented in the form of animated videos, which are interesting and easy to understand according to their age characteristics.

In addition, this study has a novelty compared to previous research. Most previous studies have only examined conventional health education methods or general audiovisual media, whereas this study specifically uses animated video media tailored to high school students in an Indonesian school setting (SMAN 15 Semarang). The animated video developed in this study contains five core topics—definition, clinical symptoms, modes of transmission, prevention, and treatment of HIV/AIDS—combined with attractive visuals and storytelling designed for adolescents. Furthermore, the instrument used to measure knowledge was adapted and validated for this specific context. These aspects differentiate this research from earlier studies and highlight its contribution to the development of more engaging and effective health education media for adolescents.

This study is in line with research conducted by Ananda Ismail et al (2022), which shows that there is a significant influence between increasing knowledge and attitudes in preventing HIV/AIDS transmission, with a p-value of 0.000 ($p < 0.05$). This means that media-based health education interventions are effective

in increasing adolescents' understanding of important health issues such as HIV/AIDS, while also influencing their attitudes in making healthier and more responsible decisions.

This study shows that after being given a health education intervention based on animated video media, there was a significant increase in the level of knowledge of adolescents at SMAN 15 Semarang, with 72.5% of respondents in the good knowledge category. Enni Juliani (2024) reported a significant increase in understanding of HIV/AIDS and awareness of the importance of prevention. The use of social media as a primary source of information also increased, while conventional media such as television and radio decreased. These results indicate that technology-based learning media can be an effective tool in delivering health education.

This increase can be explained through the concept of three main domains in health education, namely knowledge, skills, and attitudes. Health education plays an important role in creating opportunities for individuals to improve health literacy, as well as life skills that support disease prevention efforts (Mubayyina et al., 2020). In this context, delivering information through animated video media is an effective educational strategy, because it is easier for adolescents to accept and understand.

Furthermore, Notoatmodjo (2012) stated that a good learning process will produce good knowledge. Knowledge is the main factor that influences a person's attitude and behavior, including in making health-related decisions. Therefore, educational interventions that are designed visually, informatively, and age-appropriately such as animated videos have been proven to be able to form a strong knowledge base for adolescents in facing the risk of HIV/AIDS.

However, this study also has several limitations. First, the sample was taken only from one school (SMAN 15 Semarang), so the results cannot be generalized to all adolescent populations with different social, cultural, or regional backgrounds. Second, the study only measured knowledge immediately after the intervention, without long-term follow-up to assess retention of knowledge or changes in actual behavior. Third, the possibility of external influences, such as access to information from social media or peers during the study period, may have affected the results.

Another critical point is that although the intervention successfully improved knowledge, this study did not directly measure changes in preventive behavior

related to HIV/AIDS. In fact, behavioral change is the ultimate goal of health education. Future studies should integrate behavioral assessments or attitude measurements to obtain a more comprehensive understanding.

Despite these limitations, this study provides practical implications for adolescent health programs. The findings suggest that animated video media can be an innovative, attractive, and effective alternative to conventional learning methods in schools. Public health practitioners and educators are encouraged to integrate technology-based media, particularly animation, into health promotion programs targeting adolescents. Furthermore, collaboration between schools, health services, and media developers is needed to produce educational content that is accurate, culturally appropriate, and tailored to the developmental needs of adolescents.

Based on the results of the Wilcoxon test analysis, a significance value (2-tailed) of p = 0.000 (<0.05) was obtained, which indicates that there is a significant difference between the knowledge values before (pretest) and after (posttest) given a health education intervention based on animated video media. This indicates that there is a significant influence of providing education using animated video media on increasing adolescent knowledge about HIV/AIDS.

The results of this study confirm that animated video media is effective as a means of health education, especially in conveying complex information such as HIV/AIDS to the adolescent age group. This significant increase is also reflected in changes in the distribution of knowledge categories, where before the education was given, the majority of respondents were in the good knowledge category (62.5%), and after the intervention, all respondents (100%) were in the good knowledge category.

This research aligns with Irma Fidora's research (Fidora & Utami, 2022), which revealed an increase in adolescents' average knowledge of reproductive health after counseling. Furthermore, these results are supported by the findings of Lismawati and Septiwiyarsih (2021), who stated that adolescent girls' knowledge increased significantly after receiving health education through animated videos. They reported that prior to health education, only 13.7% of respondents had good knowledge, which increased to 87.4% after the intervention.

This increase in knowledge is a strong indication that health education packaged in interactive visual forms such as animated videos can make it easier for

teenagers to understand health issues, including HIV/AIDS prevention. In addition, the success of delivering information through visual media also reduces the potential for misunderstanding and strengthens students' memory of the material presented.

However, the role of media in adolescents' lives is not always positive. According to Lismawati and Septiwiyarsih (2021), media such as television that is not properly filtered can actually be a means of influencing negative behavior, such as free sex or drug abuse. This will have an impact on increasing the risk of sexually transmitted diseases including HIV/AIDS. Therefore, it is important for adolescents to be equipped with the right information and education, so that they can filter the information they receive and are able to make wise health decisions.

According to the researcher's observation, before being given education, most respondents did not clearly understand what HIV/AIDS is, how it is transmitted, and how to prevent it. Therefore, it is very important to provide correct and accurate understanding to adolescents, considering that they are an age group that is in the identity search phase and is very easily influenced by the social environment and information they receive from various media.

With a fairly large youth population and the potential to be agents of change in the future, it is very important to make them the main target in health education programs, including education about HIV/AIDS, in order to produce a healthy, caring, and knowledgeable generation.

CONCLUSION

The knowledge of adolescents in the intervention group showed an increase based on the average pretest and posttest scores. Health education about HIV/AIDS using animated video media was significantly effective in increasing adolescent knowledge, because it was delivered in an interesting, easy-to-understand way, and in accordance with the characteristics of the adolescent's age. This intervention can be a relevant educational strategy in efforts to prevent HIV/AIDS from school age. Based on these findings, it is recommended that similar animated video–based health education programs be implemented in other schools to reach a wider population of adolescents. Furthermore, future research is advised to include a control group and conduct long-term follow-ups to more accurately evaluate the effectiveness and sustainability of this intervention.

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