

Health Education Improved HIV/AIDS Knowledge among Middle School Students

Wafa Al Mufida¹, Edi Purwanto², Indah Dwi Pratiwi³

Nursing Study Program, Faculty of Health Sciences, Universitas Muhammadiyah Malang, Malang, Indonesia

Corresponding author: purwa_edi@umm.ac.id

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ABSTRACT

Adolescents are a population group vulnerable to HIV/AIDS transmission due to limited knowledge and the potential involvement in risky behaviors. This study aimed to analyze changes in HIV/AIDS knowledge after health education among adolescents. A quantitative approach with a one-group pretest-posttest design was employed. A total of 73 students participated in the study. Data were collected through pretest and posttest assessments using the HIV Knowledge Questionnaire-18 (HIV-KQ-18). The data were analyzed using the Wilcoxon Signed-Rank Test. The mean knowledge score increased from 7.10 before the intervention to 15.14 after the intervention, and the difference was statistically significant ($Z = -7.552$, $p < 0.001$). Within the limitations of a one-group pretest-posttest design without a control group. The findings suggest that health education has the potential to improve HIV/AIDS knowledge among adolescents.

Keywords:

Adolescent;
Intervention;
Learning media.



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INTRODUCTION

Human Immunodeficiency Virus (HIV) is the causative agent of Acquired Immunodeficiency Syndrome (AIDS). HIV/AIDS targets the human immune system by infecting and destroying vital components known as T lymphocytes and T cells (Hendrawan et al., 2022). To date, HIV and AIDS remain an unresolved global health challenge. In 2023, an estimated 39.9 million people were living with HIV worldwide (Killet et al., 2025). In Indonesia, the number of reported HIV-positive cases has steadily increased over the past eleven years. In 2024, 63,707 HIV cases and 21,536 AIDS cases were reported, representing a significant increase compared with the previous three years (Ministry of Health Republic Indonesia, 2024).

According to the World Health Organization (WHO), adolescence is the period between 10 and 19 years of age, representing the transitional phase from childhood to early adulthood (Rini, 2025). Adolescence is a crucial period for building a strong foundation of health knowledge. During this stage, adolescents experience rapid physical, mental, and social development. They begin to think, make decisions, and interact with the world around them. At the same time, they start developing habits that may either benefit or threaten their future health, including dietary habits, physical activity, drug use, and sexual behavior (Aisyaroh et al., 2023). Consequently, adolescents are considered one of the groups most vulnerable to HIV/AIDS transmission (Sumakul et al., 2024). Limited health literacy and insufficient knowledge of reproductive health and HIV/AIDS may reduce their ability to adopt preventive behaviors and

increase the likelihood of behaviors that facilitate HIV transmission (Trimawartinah & Alfioirelia, 2025).

Health promotive and preventive efforts related to HIV/AIDS should be initiated during adolescence to encourage healthy preventive behaviors. Health education is one of the main interventions to improve adolescents' knowledge and shape their attitudes toward HIV/AIDS (Salsabilla & Agesti, 2025). Previous studies have consistently reported that health education effectively improving adolescents' knowledge regarding HIV/AIDS (Elfika et al., 2024; Nurlindawati et al., 2023) .,

Schools, as formal educational institutions, are strategic settings for implementing health education programs (Yusuf, 2025). Schools play an important role in improving adolescents' knowledge to support HIV/AIDS prevention. However, adolescents' knowledge about HIV/AIDS still needs to be improved. A study conducted in Indonesia in 2023 found that low levels of HIV/AIDS knowledge were associated with increased risky sexual behavior. The study found that adolescents with limited knowledge were more likely to engage in unsafe sexual practices, such as having sexual intercourse without using condoms (Maulana et al., 2024). Therefore, strengthening adolescents' knowledge about HIV/AIDS through structured health education programs in school is essential.

Although many studies have demonstrated the effectiveness of health education in improving adolescents' knowledge about HIV/AIDS, no previous study has examined its effect among students at SMPIT As-Assalam, Malang City. Therefore, this study was conducted to analyze the effect of health education on HIV/AIDS knowledge among adolescents at SMPIT As-Assalam, Malang City.

METHOD

This study employed a quantitative approach with a quasi-experimental design conducted without a comparison or control group. The study aimed to examine the effect of HIV/AIDS health education on the same group of participants through two assessment phases: Pre-intervention and post-intervention. A one-group pretest-posttest design was used. The study began with a pretest, followed by the health education intervention, and concluded with a posttest to evaluate the effectiveness of the intervention (Rahmani & Hamdani, 2025).

The study was conducted at SMPIT As-Assalam, Malang City. This school was selected because, based on information from the school, no previous health education program or research on HIV/AIDS had been conducted there. In addition, the school fully supported the implementation of this study allowing the health education program to be carried out effectively. Data were collected from May 19-21, 2026. The study population consisted of all 73 students in grades VII ti IX at SMPIT As-Assalam, Malang City. The researchers used a total sampling technique, including the entire population as the study sample. All students attended and met the study criteria, resulting in a final sample of 73 participants. This study received ethical approval from KEPK FIKES UMM with approval number NO. E.4.d/119/KEPK/FIKES-UMM/V/2026. Before data collection, the researchers obtained institutional permission from the school principal and teachers. All respondents were informed about the study's purpose and procedures and provided written informed consent independently before data collection.

The HIV/AIDS health education intervention procedure was conducted using the lecture method supported by Microsoft PowerPoint presentations, as this method is considered the most commonly chosen approach for delivering information. This method is considered effective because it involves direct instruction and guidance for participants during the learning process (Elfika et al., 2024). In addition, a module and an educational video were used to provide structured, systematic information about HIV/AIDS, helping participants better understand the material and improve their knowledge in line with the study objectives. The intervention was delivered for 45 minutes in three sessions. The educational material covered the basic concept of HIV, modes of HIV transmission, HIV/AIDS prevention, treatment, and support for people living with HIV/AIDS (PLWHA)

The instrument used in this study was the HIV Knowledge Questionnaire-18 (HIV-KQ-18), which consists of 18 items to measure adolescents' knowledge of HIV/AIDS. The questionnaire uses two response options: "B" (benar means true) and "S" (salah means false). Each correct answer was scored as 1, while each incorrect answer was scored as 0. The total score represented the participants' level of HIV/AIDS knowledge (Arifin et al., 2023). Kurniawan et al. (2022) previously evaluated the validity and reliability of the Indonesian version of the HIV-KQ-18 questionnaire.

Data were collected in two stages: a pretest and a posttest. The pretest was administered before the health education intervention to assess the students' baseline knowledge of HIV/AIDS. After the pretest, the HIV/AIDS health education intervention was conducted. The posttest was administered immediately after the intervention on the same day using the same questionnaire as the pretest. This procedure measured the immediate change in participants' knowledge following the health education intervention.

The normality test was conducted using the Kolmogorov-Smirnov analysis, as the number of respondents exceeded 50 ($N = 73$). Data were considered to follow a normal distribution if the obtained significance value (p -value) $> 0,05$.

Table 1. Kolmogorov-Smirnov normality test

Kolmogorov-Smirnov ^a			
	Statistic	df	Sig.
Pretest	0.122	73	0.009
Posttest	0.125	73	0.003

Based on the results presented in Table 1, the p -values for the pretest and post-test were 0.009 and 0.003, respectively. Since both p -values were less than 0.05, the null hypothesis H_0 was rejected, indicating that the data were not normally distributed. Since the data were not normally distributed, the Wilcoxon Signed-Rank Test was used to compare the pretest is appropriate for comparing paired data that are not normally distributed (Aini & Inayah, 2019). A p -value of < 0.05 was considered statistically significant.

RESULTS

Table 2. Knowledge scores before and after HIV/AIDS health education among adolescents

Parameter	Knowledge Scores	
	Pretest	Posttest
Mean	7.10	15.14
Standard Deviation	2.116	1.895
Minimum Score	3	11
Maximum Score	11	18

Table 2 shows that the mean pretest score was 7.10, while the mean posttest score increased to 15.14 after the HIV/AIDS health education intervention. The standard deviation was 2.116 for the pretest and 1.895 for the posttest. The minimum scores were 3 and 11 for the pretest and posttest, respectively, whereas the maximum scores were 11 and 18.

Table 3. Result of the Wilcoxon Signed-Rank test on pre-test and post-test knowledge scores

Variable	Z	P-value
Pretest-Posttest	-7.552	<0.001

Table 3 shows the result of the Wilcoxon Signed-Rank Test. A Z value of -7.552 and a p-value of < 0.001 were obtained, indicating a statistically significant difference between the pretest and posttest knowledge scores.

DISCUSSION

Knowledge level prior to the intervention (pre-test)

Before the health education intervention, the respondents' knowledge scores ranged from 3 to 11, with a mean score of 7.10. These findings indicate that the respondents' baseline knowledge of HIV/AIDS was not yet optimal. Various internal and external factors influence knowledge. Internal factors include individual characteristics, such as age, education, and sex, while external factors include family support, peer influence, and access to various sources of information, such as school, healthcare professionals, the internet, social media, and printed media (Ismawati et al., 2025). These findings are consistent with the study by Gusrianti et al., (2023), which reported that students had a relatively low mean knowledge score before receiving health education because they had not previously received HIV/AIDS health education.

Knowledge level following the intervention (post-test)

The result showed that after receiving HIV/AIDS health education, the respondents' mean knowledge score increased compared with the pre-intervention score. This improvement indicates that the health education intervention was effective in increasing the respondents' understanding of HIV/AIDS. It also suggests that respondents received and understood the educational materials. The improvement in knowledge observed in this study may be attributed to the combination of learning media used during the intervention, including lectures, a Microsoft PowerPoint presentation, an educational video, and a module. Together, these media allowed respondents to receive information through both verbal and visual representations, which may have facilitated better understanding of the material and improved information retention.

Kusmaryati et al. (2022) explained that multimedia is the integration of two or more learning media that can improve learners' attention, understanding, and the effectiveness of the learning process. According to Mayer, multimedia learning does not simply involve using multiple types of media simultaneously, but integrates verbal and visual representations to help learners construct meaningful understanding (Nurhatmi, 2025). In the present study, Microsoft PowerPoint presentations, an educational video, and a module enabled respondents to receive information through both verbal and visual representations, which facilitated their understanding and retention of the material. These findings are consistent with those of Putri et al. (2023), who also implemented a mixed-media health education intervention using lectures, videos, and demonstrations. Their study similarly found that using multiple learning media improved respondents' knowledge.

The effect of health education on HIV/AIDS knowledge among middle school student

The Wilcoxon Signed-Rank Test indicated a statistically significant difference in HIV/AIDS knowledge scores before and after the health education intervention among students at SMPIT As-Assalam, Malang City. These findings suggest that the health education intervention was effective in improving adolescents' knowledge about HIV/AIDS. The result also indicates that HIV/AIDS health education is an effective approach for improving HIV/AIDS knowledge among junior high school students, consistent with previous findings (Nurlindawati et al., 2023).

These findings are consistent with the study conducted by Sabhita et al. (2022), which reported that module-based health education significantly improved adolescents' knowledge about HIV/AIDS ($p < 0.05$). Similar findings were also reported by Krey et al. (2022), who found that video-based HIV/AIDS health education improved adolescents' knowledge and attitudes toward HIV/AIDS. Overall, these studies suggest that health education delivered through various

learning media, such as modules and educational videos, has a positive effect in improving adolescents' HIV/AIDS knowledge. These findings further support the present study's results, indicating that health education is influenced not only by educational content but also by the learning media used.

In contrast to the findings of the present study, Patsani et al. (2023) reported that adolescents' knowledge of HIV/AIDS in various countries remains suboptimal, with knowledge levels varying widely and often being incomplete. This limited knowledge may lead to misconceptions and inappropriate practices related to HIV/AIDS. These differences may reflect different study objectives. Patsani et al. (2023) Previous studies reviewed adolescents' baseline knowledge without evaluating the effect of a health education intervention, whereas the present study specifically assessed changes in knowledge following HIV/AIDS health education. Therefore, the improvement in knowledge observed in this study suggests that health education has the potential to be an effective strategy for addressing inadequate HIV/AIDS knowledge among adolescents.

This study has several limitations. First, the study did not include a control group for comparison. Therefore, changes in knowledge were assessed only within a single group and could not be compared with those in a control group. Second, the HIV Knowledge Questionnaire-18 (HIV-KQ-18) measured only respondents' knowledge and did not assess their attitudes or behaviors related to HIV/AIDS prevention. In addition, the posttest was administered immediately after the intervention. Therefore, the findings primarily reflect the immediate effect of the health education intervention rather than long-term knowledge.

CONCLUSION

The increase in the maximum, minimum, and mean knowledge score from before (pretest) to after (posttest) the HIV/AIDS health education intervention indicates improved respondents' knowledge. Within the limitations of a one-group pretest-posttest design without a control group, these findings suggest that health education was associated with improved HIV/AIDS knowledge among students at SMPIT As-Assalam, Malang City.

The findings showed that respondents' HIV/AIDS knowledge improved after receiving health education delivered through the lecture method supported by Microsoft PowerPoint, video, and a module. Future studies are recommended to use a controlled study design and include follow-up assessment to evaluate long-term knowledge retention. In addition, future research may develop more interactive learning media, such as digital quizzes, educational games, or mobile-based applications, and compare the effectiveness of different educational media and methods, including group discussion and peer education.

AUTHOR'S DECLARATION

Authors' contributions and responsibilities

WAM: Writing original draft and data analysis; **EP:** Collection of data, funding support, and supervision (lead); **IDP:** Data analysis and supervision.

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