SCHOOL-BASED HEALTH EDUCATION AS A PROMOTIVE STRATEGY FOR PREVENTING HIV TRANSMISSION AMONG ADOLESCENTS IN DEPOK CITY

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ABSTRACT

Adolescents represent a population that is particularly vulnerable to *human immunodeficiency virus* (HIV) transmission due to limited knowledge, engagement in risk behaviors, and the persistence of HIV-related stigma. School-based health education serves as an important promotive and preventive strategy in efforts to reduce HIV transmission among adolescents. This community service activity aimed to enhance adolescents' knowledge of HIV and its prevention through health education. The program was implemented at SMK YAPPA Depok using a school-based health education approach, incorporating interactive counseling, group discussions, and evaluation through pretest and posttest assessments. The target participants consisted of 175 twelfth-grade students. The educational content covered the basic concepts of HIV, modes of transmission, risk factors, and HIV prevention strategies relevant to adolescents. The results demonstrated a significant improvement in adolescents' knowledge levels, with the proportion of students categorized as having high knowledge increasing from 10.86% before the intervention to 93.14% after the health education program. The activity also received positive responses and active participation from the participants throughout the educational process. It is expected that this community service program can serve as a model for school-based health education in HIV prevention among adolescents and further strengthen the role of nurses as health educators within the context of community nursing.

Keywords: Adolescents, Community Service, HIV, Health Education, Transmission Prevention.

1. INTRODUCTION

Human immunodeficiency virus (HIV) remains a significant global public health concern, particularly among adolescent populations.

Adolescence is a developmental stage characterized by dynamic biological and psychosocial changes, along with identity formation processes that foster heightened curiosity and a tendency toward exploration, including in the domain of sexual behavior. These conditions may increase adolescents' vulnerability to risk-taking behaviors that contribute to the elevated incidence of HIV (Hekster & Melvin, 2018; Ratnawati, Huda, et al., 2024a). It has been identified that approximately 31% of all newly reported HIV infections globally occur among adolescents and young adults aged 15–24 years (Wang et al., 2021).

In Indonesia, the dynamics of the HIV epidemic among adolescents demonstrate a concerning trend that warrants serious attention. Data from the Ministry of Health of the Republic of Indonesia indicate that new HIV cases are still predominantly identified among the productive-age population, including adolescents and young adults, particularly within the 20–24-year age group, which accounts for approximately 20% of cases (Kemenkes, 2025). This situation is closely associated with limited comprehensive knowledge about HIV and inadequate access to sustained reproductive health education, while nurses, as frontline healthcare providers, play a critical role in delivering sexual health education (Christopher & Ozturk, 2025).

Health education in the school setting, including sexual health education, plays a strategic role in shaping adolescents' behaviors, experiences, and protective health outcomes (Pettifor & Subramaniam, 2018). However, limitations in teachers' competencies to deliver sensitive topics to students may hinder program effectiveness, thereby preventing the intended objectives from being achieved optimally (Ringisai & Sutiningsih, 2023). Adolescents require adequate knowledge and functional skills to effectively adopt, implement, and sustain healthy behaviors as a preventive measure against sexually transmitted infections (STIs), including HIV infection (Szucs et al., 2022). In 2025, West Java Province recorded 3,906 new HIV cases, while the Depok City Health Office reported 405 new HIV cases throughout 2024 and an additional 171 new cases during the period from January to May 2025 (Dinas Kesehatan Provinsi Jawa Barat, 2025). These data indicate that HIV cases remain relatively high and suggest the potential presence of underreported cases. This situation underscores the need for comprehensive prevention efforts involving multiple stakeholders, including the strengthening of awareness and knowledge from an early stage among students at the school level.

Based on the foregoing discussion, the implementation of community service activities through health education as a strategy for preventing HIV transmission among school adolescents at SMK Yappa Depok is highly relevant and of significant urgency. The education provided is not only focused on increasing students' knowledge about HIV and AIDS but is also aimed at fostering awareness of the importance of healthy behaviors, strengthening responsible attitudes, and reducing stigma toward people living with HIV. By applying an educational approach tailored to the developmental characteristics of school-aged adolescents, this activity is expected to contribute to the early prevention of HIV transmission and support the formation of a young generation that is physically, psychologically, and socially healthy.Therefore, the objective of this community service activity is to enhance school adolescents' knowledge of HIV and its transmission

prevention through the implementation of school-based health education. In addition, this activity aims to increase adolescents' awareness of healthy lifestyle behaviors and to support efforts to reduce stigma toward people living with HIV.

2. PROBLEM STATEMENT AND RESEARCH QUESTIONS

Based on the situational analysis of the activity partners, namely, adolescent students at SMK Yappa Depok, adolescents constitute a group in a developmental phase that is vulnerable to health-risk behaviors related to reproductive and sexual health. On the other hand, access to comprehensive, continuous, and adolescent-appropriate reproductive health and HIV education remains relatively limited within the school environment. Health education in the school setting plays a crucial role as a promotive and preventive strategy in equipping adolescents with the knowledge, attitudes and skills necessary to prevent HIV transmission. However, the effectiveness of health message delivery may still be hindered by limitations in learning methods, the suboptimal use of engaging educational approaches that align with adolescents' developmental characteristics, and limited opportunities for open discussion regarding HIV and AIDS issues.

Based on the situational analysis, several key problems were identified:

a) Limited knowledge and understanding among adolescents at SMK Yappa Depok regarding HIV and strategies for preventing its transmission
b) The implementation of HIV health education in the school setting has not been optimal and does not yet fully align with adolescents' characteristics and needs.
c) The persistence of inappropriate attitudes and perceptions, including stigma toward people living with HIV, may influence adolescents' preventive behaviors.

Based on the identified problems, the guiding question of this community service activity is : "Can school-based health education improve adolescents' knowledge of HIV and its transmission prevention at SMK Yappa Depok?".This community service activity was conducted at SMK YAPPA Depok, located at Jl. Proklamasi Gg. Majlis No. 79, Abadijaya Subdistrict, Sukmajaya District, Depok City, West Java 16417, Indonesia. The location of the activity is presented in Figure 1.

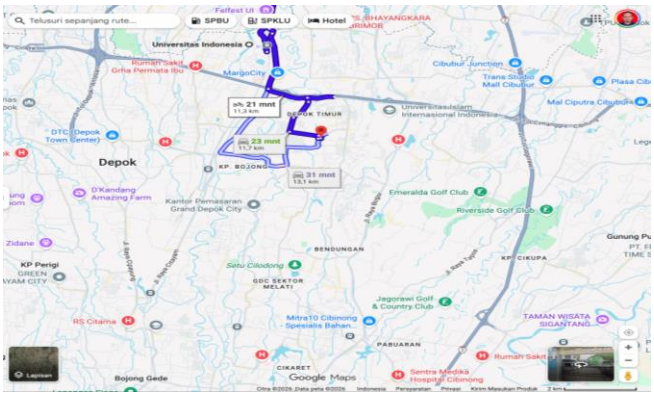

Figure 1. Community Service Activity Location

3. LITERATURE REVIEW

a. HIV Concepts and Risk Factors in Adolescents

Human immunodeficiency virus (HIV) is the causative agent of *acquired immunodeficiency syndrome* (AIDS), a condition characterized by a decline in immune system function that renders individuals vulnerable to various opportunistic infections, which may be life-threatening (Tirri, 2024). Among adolescents, HIV represents a complex health issue as it is closely associated with biological and psychosocial developmental stages, as well as behavioral changes that increase vulnerability to risk exposure.

Adolescents constitute one of the populations vulnerable to HIV transmission, as they are in a developmental phase characterized by high levels of curiosity, identity exploration, and a tendency to engage in risk-taking behaviors (Li et al., *2019*; Mahat, 2019). Adolescents are in the process of developing personal maturity; therefore, they need to hold appropriate perspectives to become individuals with a positive self-concept (Ratnawati, Setiawan, et al., 2024). HIV prevention among adolescents emphasizes promotive and preventive efforts, including the enhancement of knowledge, the development of positive attitudes, and the reinforcement of healthy behaviors. Age-appropriate and well-designed health education is one of the primary strategies for HIV prevention, as it enables adolescents to understand risks and avoid risky behaviors (Ratnawati, Huda, et al., 2024a).

b. Adolescents as the Target Group for HIV Prevention Education

Adolescence is a developmental phase that begins with the onset of puberty and extends into early adulthood. In general, this period is classified into three developmental stages: early adolescence (ages 10–14 years), late *adolescence* (ages 15–19 years), and young adulthood (ages 20–24 years) (Das et al., 2017). Adolescents in developing countries often face limited access to reproductive health information, influenced by perceptions that regard such issues as taboo and a lack of reliable information sources. This situation contributes to an increased tendency toward risk-taking behaviors and has a negative impact on adolescents' health status (Agu et al., 2021). This period represents a critical phase in the development of long-term health behaviors.

Although many adolescents use smartphones to access online health information, limited digital health literacy often makes it difficult for them to assess the credibility of information sources, thereby increasing the risk of misinformation and hindering appropriate help-seeking behaviors (McKinnon et al., 2020). School-based health education programs and accurate online resources are recommended to improve access to reliable information. Schools represent an effective setting for health behavior interventions, as they can instill healthy habits from an early age through education, behavioral strategies, and policy changes (Lee et al., 2024). School-based HIV/AIDS education has been shown to be effective in improving students' knowledge and attitudes toward HIV/AIDS, as well as in promoting more positive behavioral changes. (McKinnon et al., 2020).

HIV education programs for school adolescents are designed by integrating the principles of school-based health education and *positioning* schools as strategic settings for promotive and preventive

interventions. These programs emphasize the delivery of accurate information on HIV and AIDS, modes of transmission, prevention strategies, as well as issues of stigma and discrimination, using communication approaches that are appropriate to adolescents' developmental characteristics.The implementation of health education programs as an effort to prevent HIV transmission among school adolescents has high significance in supporting promotive and preventive public health strategies. School-based HIV education programs have been shown to be effective in improving students' knowledge and attitudes toward HIV prevention. Similar findings were demonstrated by the implementation of programs in Nigeria, which resulted in significant improvements in students' knowledge, attitudes, and practices related to the prevention of sexually transmitted infections (STIs) and HIV (Yohanna et al., 2023).

In terms of contribution, this community service activity strengthens the role of educational institutions, particularly nursing institutions, as agents of health promotion and serves as a model for the implementation of contextual and easily replicable HIV education. The program supports efforts to enhance adolescents' health literacy, strengthen awareness of healthy behaviors, and reduce stigma and discrimination related to HIV.

4. METHOD

The HIV prevention education activity for adolescents was conducted on *August* 27, 2025, at the Hall of SMK Yappa Depok. This community service activity employed a school-based health education counseling method. The educational approach was selected because it is relevant to the target population and effective in increasing adolescents' knowledge and awareness of health issues, particularly HIV transmission prevention. The health education session was conducted interactively through lectures, discussions, and question-and-answer activities, allowing for two-way communication between educators and participants. The educators were doctoral-level students from the Faculty of Nursing, Universitas Indonesia (FIK-UI), as part of the Graduate Student Association program. A total of 175 twelfth-grade students participated in the activity. The implementation procedures were carried out through the following steps :

a. Pre-implementation
   Prior to the implementation of the community service activity, an audience meeting was conducted with the school leadership to discuss the objectives and scope of the activity, the required preparations, and the scheduling of the program. One day before the activity, the hall and other necessary facilities were prepared by the management of SMK Yappa Depok.
b. Implementation
   Before the activity commenced, participant registration was conducted, followed by a ceremonial opening that included the singing of the Indonesian national anthem, the Universitas Indonesia anthem, a prayer session, and opening remarks from representatives of the school and the Graduate Student Association of the Faculty of Nursing, Universitas Indonesia (HMP FIK-UI). Prior to the delivery of the educational session,

participants completed a pre-test questionnaire related to HIV (Arifin et al., 2022). Subsequently, the resource persons delivered a presentation covering the definition of HIV, mechanisms of transmission, risk factors, key populations affected by HIV, and HIV prevention measures that can be adopted by adolescents.

c. Closing/Evaluation
At the end of the education session, a post-test evaluation was conducted using the same questionnaire as the pre-test, along with a randomly administered quiz with incentives that generated high participant enthusiasm. This evaluation assessed participants' levels of knowledge and serve as a basis for developing recommendations for subsequent community service activities

5. RESEARCH FINDINGS AND DISCUSSION

a. Results

The community service activity in the form of health education on HIV transmission prevention was conducted at SMK YAPPA Depok on August 27, 2025. The education was delivered using a school-based approach through interactive lectures (PowerPoint presentations) and discussions. The materials presented covered the definition of HIV, modes of transmission, risk factors, key populations affected by HIV, and HIV prevention measures relevant to school adolescents.

Table 1. Participant characteristics

Characteristics	N	%
Gender		
Male	68	38,86
Female	107	61,14
Total	175	100
Grade Level		
X	0	0
XI	0	0
XII	175	100
Total	175	100

Based on the table of respondent characteristics, 175 students participated in the community service activity. The majority of respondents were female, totaling 107 students (61.14%), while male respondents numbered 68 students (38.86%). In terms of grade level, all respondents were from Grade XII, accounting for 175 students (100%), with no respondents from Grades X or XI.

Table 2. Adolescents' Knowledge Levels on HIV Before and After the Health Education Intervention

Category	Before (N)	%	After (N)	%
Low	156	89,14	12	6,86
High	19	10,86	163	93,14
Total	175	100	175	100

Based on the table showing the distribution of respondents' knowledge levels before and after the implementation of HIV health education, a significant change in students' knowledge categories was observed. Prior to the educational intervention, the majority of respondents were in the low knowledge category, totaling 156 students (89.14%), while only 19 students (10.86%) were in the high knowledge category. After the health education intervention was implemented, a significant improvement in respondents' knowledge levels was observed. The number of students with high levels of knowledge increased to 163 (93.14%), whereas the number of students with low levels of knowledge decreased markedly to 12 (6,86%) students

Figure 2. Opening Ceremony Led by the Principal of SMK Yappa Depok

Figure 3. HIV Prevention Health Education for Students at SMK Yappa Depok

Figure 4. Evaluation and Discussion Following the Health Education Session

b. Discussion

The implementation of the activity proceeded smoothly and received strong support from the school. The educational environment was conducive, as evidenced by active participant engagement during discussions and question-and-answer sessions. The results presented in Table 1 indicate that most respondents in this community service activity were female, totaling 107 students (61.14%). This finding indicates that female respondents predominated in HIV prevention health education activities. Several studies suggest that female adolescents tend to demonstrate greater interest and engagement in reproductive health and disease prevention issues, including HIV, compared to their male counterparts (Gyamfi, 2019; Kuzovatova & Zaitseva, 2021).

All respondents were from Grade XII (100%), indicating that the target of the activity consisted of late adolescents. This phase represents a transitional period toward young adulthood, characterized by increasing independence and decision-making related to health behaviors (Kim-Spoon et al., 2016). Therefore, HIV health education interventions for this group are considered strategic, as they can shape sustained preventive behaviors into adulthood.

The results presented in Table 2 demonstrate a significant increase in adolescents' knowledge levels regarding HIV following the health education intervention. Prior to the educational program, the majority of respondents were in the low knowledge category (89.4%), indicating limited understanding of HIV among adolescents, including modes of transmission, prevention strategies, and its impact on health. These findings are consistent with several studies reporting that adolescents continue to experience gaps in HIV-related knowledge due to insufficient comprehensive and sustained reproductive health education in school settings (Babbar & Dev, 2025; Fasil et al., 2022).

Following the health education intervention, a significant increase in knowledge was observed, with most respondents shifting from the low knowledge category to the high knowledge category (93.14%). This improvement indicates that school-based health education is an effective approach for enhancing adolescents' understanding of HIV. Structured educational delivery, the use of age-appropriate language, and active participant engagement improved students' information uptake. This

finding is consistent with the results of systematic studies indicating that school-based HIV/AIDS education significantly improves adolescents' knowledge and attitudes toward HIV prevention (Fonner et al., 2014; Ratnawati, Huda, et al., 2024b).

The increase in knowledge following the intervention has important implications for the prevention of risk-taking behaviors among adolescents. Adequate knowledge serves as a foundational element in the development of positive health attitudes and behaviors. Adolescents who understand the risks of HIV and its prevention are more likely to have stronger intentions to avoid risky behaviors and to be more receptive to preventive efforts and health-seeking behaviors (Afriyie & Essilfie, 2019). This finding underscores the role of schools as strategic settings for promotive and preventive HIV interventions, particularly among late adolescents.

Therefore, the authors assume that the improvement in adolescents' knowledge of HIV following the health education intervention was influenced not only by the content delivered but also by the educational approach employed. School-based health education delivered in a structured, interactive manner and aligned with adolescents' developmental characteristics facilitates a more effective and meaningful learning process. The authors further assume that the school environment represents a strategic setting for promotive and preventive interventions, as it provides a conducive space for the delivery of health information, open discussion, and the formation of positive attitudes and social norms.

6. CONCLUSION

The community service activity in the form of health education on HIV transmission prevention among school adolescents at SMK YAPPA Depok was successfully implemented and received a positive response from participants. School-based health education, delivered in a structured, communicative, and interactive manner, was shown to enhance adolescents' engagement in the learning process, particularly in relation to their basic understanding of HIV, modes of transmission, risk factors, and prevention strategies relevant to adolescents.

The evaluation results demonstrated a significant increase in adolescents' knowledge levels following the health education intervention, as indicated by a shift in the majority of respondents from the low knowledge category before the education (10.86%) to the high knowledge category after the education (93.14%). These findings confirm that school-based health education is an effective promotive and preventive strategy for HIV transmission prevention among adolescents. In addition to increasing knowledge, this activity also contributed to raising adolescents' awareness of the importance of healthy behaviors and broadening their understanding of HIV-related issues, thereby potentially reducing stigma toward people living with HIV. Overall, this community service activity reinforces the role of nurses as health educators.

School-based health education is considered relevant and strategic in supporting early HIV transmission prevention efforts and can generate long-term impacts in reducing HIV transmission risks among younger generations.

Based on the findings of this community service activity, future programs are recommended to expand the scope and sustainability of school-based HIV health education by strengthening cross-sectoral collaboration, particularly with community health centers and other healthcare services. In addition, the use of innovative and technology-based educational media may be considered to enhance adolescents' engagement and reinforce long-term HIV prevention efforts.

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