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ORIGINAL ARTICLE

Enhancing HIV/AIDS Prevention in Adolescents: An Information-Motivation-Behavioral Skills Approach

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ABSTRACT

OBJECTIVE: The purpose was to find out how adolescents' knowledge and attitudes about HIV/AIDS prevention were affected by health education that used a motivational information approach.

METHODOLOGY: This study employed a quasi-experimental design conducted in Bima, NTB, Indonesia, from July 2024 to January 2025. A cluster sampling technique was used, resulting in a total of 374 students divided into two different groups. The control group received HIV/AIDS educational materials in the form of textbooks without support from cadres. In contrast, the intervention group was given a booklet about HIV/AIDS and received guidance from a cadre. The intervention was carried out four times a week for six months. Data analysis was performed using a paired t-test.

RESULTS: The intervention significantly improved knowledge and attitudes towards HIV/AIDS prevention in adolescents, regardless of the control or intervention group. The intervention group showed a significant increase in knowledge scores about HIV/AIDS, with an average score of 13.74, compared to the control group's 8.04. The intervention group also showed a significant increase in attitude scores, with an average of 47.12, compared to the control group's average of 35.04. Both knowledge and attitude in the intervention group had p-values of <0.000.

CONCLUSION: The intervention proved to be more effective in improving knowledge and attitudes towards HIV/AIDS.

KEYWORDS: HIV-AIDS, Health Education, Cadre, Information, Adolescents

INTRODUCTION

Adolescents are the fastest growing population and are at risk for HIV/AIDS in all countries.[1] AIDS transmission currently mainly attacks teenagers of various age groups.[2] Nearly 50% of adolescents diagnosed with HIV are under the age of twenty-five. HIV is currently the leading cause of death for individuals between the ages of 15 and 24.[3.] This happens because they tend to use condoms incorrectly, teenagers are generally infected through unprotected sexual activity and drug use as a result of promiscuity.[4] Adolescents represent a demographic significantly affected by HIV/AIDS, particularly due to their heightened vulnerability during this transitional life stage. Research indicates that adolescents exhibit risky sexual behaviors, partly driven by misconceptions about HIV transmission and the stigma surrounding the disease [5,6]. Peer influence and lack of comprehensive sexual education compound this issue, as many youths remain unaware of accurate prevention methods.[7]

The success of HIV prevention in adolescents depends on the understanding of HIV prevention and transmission among them.[8] HIV/AIDS prevention strategies can include initiatives, AIDS counseling services, contact centers, and needle exchange programs. Several activities targeting educational interventions play a significant role in raising awareness and encouraging HIV AIDS prevention among adolescents.[9] Several strategic preventive steps have been taken in the field of education and increasing awareness, especially for teenagers (mainly in the areas of safe sex promotion, risk behaviour, and disease transmission).[10] One of the most important efforts for HIV prevention is encouraging responsibility for actions, using condoms, and promoting healthy behavior.[11]

A good understanding will indirectly increase awareness of HIV/AIDS both in terms of behavior and knowledge, so that this will affect the reduction of the risk of infection.[12] Generally, HIV/AIDS is influenced by risky sexual behavior, such as changing partners and unsafe sex behavior, both in terms of condom use and transmission methods.[13] Adolescent girls have less knowledge of HIV/AIDS than adolescent boys. So adolescent girls often have greater misunderstandings regarding HIV/AIDS than adolescent boys. This affects the perception of preventing this disease.[14]

A Study has shown the need for comprehensive sex education to improve knowledge and attitudes regarding risky behaviors for HIV/AIDS transmission.[15] Unplanned pregnancy, high-risk behavior, and education programs are essential to improving understanding and attitudes related to HIV/AIDS.[16] Domestic violence, dating behavior, healthy relationships, and social and emotional learning can be improved with comprehensive sex education.[17]

Both psychological and socioeconomic factors can significantly influence adolescents' high-risk behaviors regarding sexual activity. Psychological distress, such as anxiety and mood disorders, is closely associated with risky sexual behaviors, including early sexual debut and inconsistent condom use. Furthermore, adolescents facing adverse psychological effects are likely to engage in sexually risky activities as a coping mechanism to deal with feelings such as loneliness or anxiety.[18]

The purpose of this study was to analyze the impact of health education with a motivational information approach on adolescents' knowledge and attitudes regarding HIV/AIDS prevention. The study is categorized as new because it provides insight into the effectiveness of this strategy to improve adolescents' understanding and perspectives regarding HIV/AIDS.

METHODOLOGY

Research Design

The design of this study is quasi-experimental with pre-test and post-test, and compares the control and intervention groups.

Study Area

This study was conducted in Bima City, NTB Province, Indonesia, between July 2024 and January 2025. Bima City has 39 schools, with 5,562 students (data from the Ministry of Education, Indonesia). The sample consisted of high school students, regardless of ethnicity, age, and gender. Cluster sampling was employed in this study due to its practicality and efficiency in the context of Bima City, where the population is distributed across multiple schools. Cluster sampling allows researchers to divide the population into distinct subgroups or clusters, in this case, the schools, from which a sample of high school students can be randomly selected. This method is particularly advantageous when dealing with large populations, as it reduces time and costs associated with data collection by enabling researchers to focus on specific locations—in this instance, selected schools within Bima City.

Additionally, cluster sampling mitigates the difficulties in accessing a fully comprehensive list of high school students, thereby enhancing feasibility. It ensures that the sample remains representative of the diverse school demographics without the need for extensive data on each student. Ultimately, utilizing cluster sampling in this study aligns with both methodological rigor and logistical practicality, ensuring that a sufficiently diverse and representative sample of high school students is obtained.

Sampling

The cluster sampling technique is used in the sampling method. With this technique, the researcher divided the research area into five specific areas based on the sub-districts in Bima City. The formula used is n = n / 1 + n (e2). The number of samples obtained was 374 students divided into 5, so that each specific area received a sample proportion of 74 to 75.

Intervention

The intervention to enhance knowledge and attitudes towards HIV/AIDS comprised a systematic five-stage approach. Initially, communication was established with key local agencies, including the Director General of the Ministry of Education and Culture in Bima, to ensure compliance with existing regulations (Stage One). Subsequently, a baseline survey assessed the knowledge and attitudes of the target population regarding HIV/AIDS, informing the development of a tailored education program (Stage Two).

In the third stage, mentors were organized into five groups strategically positioned across various schools, tasked with providing essential guidance to student samples regarding HIV/AIDS. The program's design differentiated between a control group, which received a textbook module without mentorship, and an intervention group that was given both a booklet and mentor support, with structured sessions implemented four times a week for six months (Stage Four).

Finally, in the last month of the intervention, comprehensive monitoring and evaluation were conducted to measure changes in knowledge and attitudes, comparing results from the initial survey to those following the educational intervention (Stage Five). This rigorous framework ensures that the program is not only compliant with policy but also effective in achieving its academic goals.

Data Collection Tools and Techniques

The questionnaire used to assess the level of knowledge is based on the WHO. To evaluate attitudes, a questionnaire containing ten questions with a Likert scale was used. Strongly disagree (1), disagree (2), agree (3), Strongly agree (4). The questionnaire used to assess

knowledge levels was based on sources from the World Health Organization (WHO) to ensure the accuracy and relevance of the information collected. It was designed to evaluate respondents' understanding of specific health issues addressed by the WHO, such as disease prevention, health promotion, or safe health practices. To assess attitudes, the questionnaire consisted of ten questions designed using a Likert scale. In this format, respondents were asked to rate specific statements regarding their attitudes and perceptions by selecting one of four options: "strongly disagree" (1), "disagree" (2), "agree" (3), and "strongly agree" (4). The use of a Likert scale allows for measuring the intensity of attitudes, providing an in-depth quantitative analysis of respondents' views on relevant issues. Thus, this questionnaire provides a comprehensive tool for exploring two crucial dimensions—knowledge and attitudes—that influence individual health behaviors.

Data analysis

Data on age, gender, knowledge and attitude were tested univariately. A paired T-test was used to assess the differences in the level of knowledge and attitude between the control and treatment groups. The use of the paired t-test in this study has several underlying reasons. First, the paired t-test is designed to compare two sets of interrelated measurements, in this case, the participants' knowledge and attitudes before and after an intervention (control and treatment groups). This allows researchers to measure changes in the same variables in the same individuals, thereby increasing the accuracy of the results. Second, the paired t-test takes into account variability in individual measurements, thus helping to reduce type I errors that might occur if the analyses were conducted independently.

Ethical Clearance

This research has received approval from the ethics committee of Poltekkes Kemenkes Mataram with No. 0140/EA/KEPK/2024.

RESULTS

The average age of the adolescents in the control group was 15.72 years, with a standard deviation of 0.991, as seen in **Table I**. The participants in the intervention group were aged between 14 and 18 years. The mean age of the respondents was 16.18 years, accompanied by a standard deviation of 1.101.

Table I: Respondent characteristics based on age

Variables	Mean	SD	Min Mak	95% CI
Age				
Control	15.72	0.991	14-18	15.44 – 16.00
Intervention	16.18	1.101	14-18	15.87 - 16.49

Table II presents a comparative analysis of respondent characteristics by gender in two groups: Intervention and Control. The sample consisted of 187 respondents in the Intervention group, with 45% males (n=83) and 55% females (n=104). In the Control group, there were also 187 respondents, with 47.5% males (n=89) and 52.5% females (n=98).

Table II: Respondent characteristics based on gender

Variables	Group			
	Intervention		Control	
	n	%	n	%
Gender				
Man	83	45	89	47.5
Woman	104	55	98	52.5

Table III revealed a notable disparity in knowledge levels between the intervention and control groups. The intervention group achieved an average knowledge score of 8.02, whereas the control group recorded a slightly higher average score of 8.04. Results from the paired T-test demonstrated a significant difference in knowledge levels pre- and post-intervention. Furthermore, the study identified significant variations in attitudes between the two groups. The intervention group had a mean attitude score of 35.04, compared to the control group's mean score of 34.96. The paired T-test results indicated a significant difference in attitudes for the intervention group, while the control group exhibited no significant change.

Table III: Knowledge and attitudes before and after treatment in the intervention and control groups in adolescents

Variables	Group	Mean	SD	S.E.	Min Mak	95% CI	P value
Knowledge	**Intervention**						
	Pre	8.02	1,059	0.150	6 - 10	7.72 – 8.32	0.000
	Post	13.74	0.828	0.117	12 - 15	13.50 – 13.98	
	Control						
	Pre	7.94	0.867	0.123	5 - 10	7.69 - 8.19	0.124
	Post	8.04	0.781	0.111	6 - 10	7.82 – 8.26	
Attitude	**Intervention**						
	Pre	35.04	1,761	0.237	30 - 40	34.54 – 35.54	0.000
	Post	47.12	1,637	0.237	44 - 52	46.65 – 47.59	
	Control						
	Pre	34.96	1,678	0.248	31 - 40	34.48 - 35.44	0.144
	Post	35.04	1,678	0.332	31 – 40	34.56 – 35.52	

Table IV indicates that the intervention group exhibited a greater enhancement in knowledge compared to the control group across the four targeted areas of knowledge. These areas include the transmission of HIV, the causative agent of AIDS, the heightened risk associated with multiple sexual partners, and the understanding of HIV carriers.

Table IV: Knowledge about issues related to HIV/AIDS before and after intervention

Knowledge	Correct answers (Pre)	Correct answers (Post)	Correct answers (Pre)	Correct answers (Post)
	Intervention		**Control**	
Spread of HIV	77.7 %	81.5 %	76.9 %	79.5 %
Causative agent of AIDS	75.5 %	83.2 %	73%	76.8 %
Multiple sex partners increase the risk	47.5 %	83.5 %	44.5 %	78.5 %
Concept of HIV carrier	12.7 %	23.8 %	17.5 %	20.1 %

Table V indicates that the intervention group exhibited a more favorable attitude compared to the control group, as evidenced by the percentage increase in attitude scores for both groups. The evaluation of attitude encompassed two key aspects: youth vulnerability to HIV and the willingness to undergo voluntary HIV testing.

Table V: Attitudes about issues related to HIV/AIDS before and after the intervention

Attitude	Attitude (Pre)	Attitude (Post)	Attitude (Pre)	Attitude (Post)
	Intervention		**Control**	
Youth vulnerability to HIV	70%	83%	66.9 %	79.7 %
HIV voluntary testing	84.3 %	91.5 %	81.5 %	85.5 %

DISCUSSION

The findings showed that the intervention group showed a better increase in knowledge compared to the control group. The average score in the intervention group reached 13.74, while in the control group it was only 8.04. This explains that the program in the intervention group was more successful than the program in the control group. These results are supported by previous studies, which state that individual understanding will increase with good and targeted educational strategies.[19]

This study itself focuses on HIV transmission and the virus that causes HIV/AIDS, by focusing on the knowledge that having multiple sexual partners can be a significant source of risk for HIV/AIDS transmission. This study also highlights the concept of HIV carriers, where individuals who are carriers of the virus are very likely to have no symptoms. The results of the study showed that the intervention group was more effective in answering questions than the control group. This proves that proper education can improve understanding of the dangers of HIV/AIDS.[20]

HIV is generally transmitted through various ways, including from mother to child during childbirth, use of unsafe injection needles and unsafe sex. Previous studies have shown that knowledge about this can reduce the risk of HIV/AIDS transmission.[21] Adequate knowledge will also be the basis for individuals to make decisions regarding dangerous sexual behavior and unsafe use of needles.[22] The importance of good knowledge is that individuals can know how the virus is transmitted so that they can avoid risky behavior[23]. With increased education and proper education, communities can avoid the spread of HIV/AIDS.

Educating yourself and others about HIV/AIDS prevention is essential to protecting yourself from HIV/AIDS infection. We can reduce the spread of the virus and help people living with HIV by raising awareness and understanding about the disease. A key to combating this is by tackling the spread of HIV.[24] proactive steps can contribute to suppressing the spread of HIV/AIDS.

Acquired immunodeficiency syndrome (AIDS) is the result of the human immunodeficiency virus (HIV) compromising the immune system by primarily targeting CD4 T cells. [25] Sharing needles, engaging in sexual activity, nursing, or giving birth can all transfer HIV. Nearly every respondent in the intervention group demonstrated a solid grasp of the information covered in the HIV/AIDS education session and was able to provide thoughtful responses. The results show that the intervention approach effectively raises knowledge and awareness of the illness.

Other findings suggest that education about early detection and adherence to therapy can be a lifesaver for individuals with HIV/AIDS.[26] Improving the welfare of people affected by HIV/AIDS is the key to success in preventing this disease from spreading further. This is driven by awareness of the establishment of comprehensive prevention and treatment initiatives in cases of people with HIV/AIDS.[27]

Having several sexual partners increases the risk of contracting HIV because of the higher chance of contracting the virus during unprotected intercourse. The increased likelihood of transmission explains this phenomenon due to the larger number of possible encounters with people who may be HIV-positive. Unprotected sexual activity has been repeatedly demonstrated to be a major contributor to the spread of HIV in studies, highlighting the significance of safe sex practices in reducing this risk.[28] To prevent HIV from spreading to others, it's critical to engage in safe sexual behaviour and get tested for the virus regularly. There were no discernible differences between the intervention and control groups' answers on this question. The percentages in the control and intervention groups, which did not change substantially, made this clear. It is vital to take precautions and seek medical advice

when at risk because HIV infection can have significant repercussions for both the infected person and their partner.

Every individual needs to receive appropriate information regarding the dangers of having multiple partners, which can increase the risk of HIV/AIDS transmission. Safe sex practices will generally protect the community from various infectious diseases that may exist. Safe sex practices also minimize the spread of HIV/AIDS.[29] Eliminating stigma and increasing awareness of safe sexual behavior can be a pioneer in preventing HIV/AIDS or other sexually transmitted diseases.

People with HIV/AIDS who do not show any symptoms and signs of the disease are often referred to as HIV carriers. People with these characteristics should receive good care by carrying out a routine medication schedule to reduce the risk of transmission to others.[30] In both groups, based on this study, they tend to provide a deep response. The intervention given to the intervention group proved effective in increasing knowledge and awareness of HIV/AIDS and the importance of proper treatment.

For those living with HIV, regular evaluation of their viral load and CD4 count is essential to confirming the effectiveness of their treatment regimen. Frequent monitoring enables medical professionals to guarantee patients' optimal health outcomes and make well-informed decisions about therapy modifications.[31] Support from medical professionals and neighbourhood resources can also assist people in taking their medications as prescribed and preserving their general health. To boost their immune system and general health, HIV carriers should adopt healthy lifestyle habits like consistent exercise and a balanced diet. Additionally, counselling programs and mental health support can help people living with HIV deal with any emotional difficulties that may come up.[32]

The findings showed that the improvement in attitudes in the intervention group was greater than that in the control group. The intervention group showed an average attitude score of 47.12 compared to the control group, which only reached 35.04. This certainly highlights how vital the right intervention program is to influence participants' attitudes towards HIV/AIDS. In addition, a focused education program is significant in understanding the stigma associated with HIV/AIDS.

HIV-AIDS education initiatives have the potential to significantly alter social perceptions and practices, which will ultimately help achieve the overarching objective of eliminating the stigma and discrimination related to the illness. To create a more accepting and inclusive environment for those impacted by HIV/AIDS, policymakers and medical professionals should highlight these efforts. We can promote a more understanding and caring society that is better prepared to handle the difficulties experienced by individuals impacted by HIV/AIDS by funding extensive educational initiatives[33]. To stop the disease from spreading, these programs can also support early detection, access to treatment, and preventive measures.

Several factors, including the stigma attached to HIV and the lack of comprehensive sexual education, can influence the attitudes of young people at risk for the virus.[34] Communities must provide the support and tools necessary to empower youth to make informed decisions regarding their sexual health. This can entail encouraging candid discussions about sex, making condoms and other types of protection available, and providing testing and treatment services. By addressing these barriers, we can improve community health overall and reduce the risk of HIV transmission among youth. Compared to the control group, the intervention group, which has been receiving treatment for six months, has a superior understanding of this.

Promoting an inclusive and supportive culture can foster an atmosphere in which adolescents feel safer making informed decisions about their sexual health[35]. Protecting themselves from HIV infection requires Collaboration among stakeholders to ensure that adolescents are

equipped with the resources and knowledge. Educating young people about sexual health and accessible health services is needed. Collaboration between educational institutions, medical facilities, neighborhood associations, and government agencies can make this happen. Together, these parties can develop a comprehensive program.

Depending on personal experiences, anxieties, and beliefs, attitudes regarding voluntary HIV testing can differ significantly.[36] While some people may feel nervous or stigmatized, others may see testing as a proactive step in managing their health. To encourage more people to get tested, healthcare providers should provide information and assistance. People may feel more at ease obtaining tests and managing their health if a secure and accepting environment is offered.[37] Furthermore, having access to factual information on HIV might aid in debunking misconceptions and lessening the stigma associated with the virus.

Community outreach to address misconceptions and promote the importance of knowing one's HIV status is also needed.[38] Healthcare providers address barriers to testing and provide resources for those who may be hesitant. This can help them maintain the crucial role in raising the HIV level and promoting the general public's health comprehensively. Collaboration between government organizations, healthcare providers, and the general population is necessary to create comprehensive HIV prevention and treatment plans.[39]

Limitation

Because this study primarily involved high school students from a specific school located only in the city of BIMA, variations in educational background and socioeconomic conditions across regions may not be reflected.

CONCLUSION

The educational program that was carried out effectively increased understanding of HIV/AIDS. This is evidence that the intervention carried out raised awareness of HIV/AIDS. Increased knowledge and attitudes can be seen from various factors such as agents that cause HIV/AIDS, having multiple partners will pose a high risk, and how HIV/AIDS transmission can occur. In general, the intervention group outperformed the control group in various aspects. Overall, the intervention group had a strong understanding of the educational material provided. This is evidence that the intervention was successful in increasing awareness and understanding of this disease. In light of the findings from this study, future researchers are encouraged to expand the scope of interventions aimed at raising HIV/AIDS awareness by incorporating diverse educational strategies, such as interactive workshops or peer-led discussions, which may further enhance engagement and retention of information.

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