THE EFFECT OF KNOWLEDGE AND ATTITUDES OF ADOLESCENTS USING E-BOOKLET AND LEAFLET MEDIA ON HIV TRANSMISSION AT SMA ALFATAH YPKP SENTANI

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KEYWORDS

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ABSTRACT:

HIV/AIDS is one of the most severe sexually transmitted diseases affecting public health, including adolescents. Limited knowledge and negative attitudes toward HIV prevention contribute to the increasing prevalence of the disease. This study employed a quasi-experimental design with a pretest-posttest control group to analyze the impact of e-booklet and leaflet media on adolescents' knowledge and attitudes. Thirty-eight eleventh-grade students were divided into an intervention group receiving e-booklets and a control group receiving leaflets. Data were collected using structured questionnaires to measure respondents' knowledge and attitudes before and after the intervention. The data were analyzed using the Wilcoxon test to evaluate significant differences between pretest and posttest results. The findings indicated that the intervention group showed significantly improved knowledge and attitudes compared to the control group. The e-booklet was more effective in delivering information, enhancing adolescents' understanding of HIV transmission and prevention, and fostering positive attitudes. Conversely, the control group, which received only leaflets, exhibited minimal and statistically insignificant improvements. These findings highlight the importance of interactive and accessible digital media in promoting health education among adolescents. This study concludes that e-booklets are an effective educational tool for improving adolescents' knowledge and attitudes toward HIV transmission. The findings provide essential insights for developing technology-based health education programs, especially in school settings, to enhance the effectiveness of HIV/AIDS prevention efforts.

INTRODUCTION

HIV/AIDS (Human Immunodeficiency Virus/Acquired Immuno Deficiency Syndrome) is one of the most severe sexually transmitted diseases, significantly impacting global public health, including in Indonesia. The disease weakens the immune system, specifically targeting lymphocytes, which play a crucial role in fighting infections. According to WHO (2017), approximately 36.9 million people worldwide are infected with HIV, including 2.1 million children under the age of 15. The high mortality rate associated with HIV/AIDS underscores the urgent need for more effective prevention and management strategies.

In Indonesia, the number of HIV cases has risen steadily, with 427,201 cases recorded in 2021, increasing to 519,158 cases in 2022 (Kemenkes, 2022). Papua ranks among the provinces with the highest prevalence, recording 45,638 cases, followed by DKI Jakarta, East Java, and West Java. The Papua Provincial Health Office reported a significant increase in 2022, with 200,441 HIV cases and 29,570 AIDS cases (Cenderawasih Pos, 2022). This highlights the need for effective interventions targeting adolescents, a vulnerable group for HIV transmission.

Adolescents are at a critical transition stage, often exhibiting risky behaviors, including unprotected sexual activities. Research indicates that individuals aged 15–24 contribute significantly to the global increase in HIV cases due to limited knowledge, social pressures, and environmental factors (Buseh et al., 2006; Oladepo & Fayemi, 2011). In Jayapura Regency, adolescents aged 12–19 years account for 53.4% of HIV/AIDS cases (Jayapura Health Office, 2020).

School-based health education is a key strategy for preventing HIV/AIDS. WHO recommends reproductive health education for adolescents aged 10–17 years as an early preventive measure. This age range is critical for building awareness about reproductive health and fostering informed sexual decision-making (Organization, 2010; Svanemyr et al., 2015). Structured and effective health education programs within schools can significantly enhance adolescent knowledge and attitudes toward HIV prevention.

Health communication media such as e-booklets and leaflets can be used to improve adolescents' knowledge and attitudes toward HIV/AIDS. Asriyanti et al., (2024) found that e-booklets are more effective than leaflets in enhancing health awareness. E-booklets provide interactive, engaging, and easily accessible content, motivating adolescents to better understand and retain health-related information (Azinar & Fibriana, 2019; Syam et al., 2023).

Although various studies have examined the use of educational media, research gaps remain regarding the effectiveness of tools like e-booklets in high-prevalence areas such as Papua. Previous studies have primarily focused on leaflets or other media without directly comparing their impact on knowledge and attitudes. This underscores the need to investigate the comparative effectiveness of different media in enhancing HIV/AIDS awareness among adolescents.

This study offers a novel approach by comparing the effectiveness of e-booklets and leaflets in Papua, a region with a high HIV/AIDS prevalence. The study focuses on senior high school students in a critical phase of developing health-related attitudes and behaviors. The findings aim to contribute to developing effective school-based health education strategies. Based on this background, the study aims to analyze the impact of e-booklets and leaflets on adolescents' knowledge and attitudes toward HIV transmission at SMA Alfatah YPKP Sentani.

METHOD

Study Design

This study employed a quasi-experimental design with a pretest-posttest control group model. The design aimed to assess the impact of educational media interventions, specifically e-booklets, on improving adolescents' knowledge and attitudes compared to leaflets. Two groups were formed: the intervention group, which received e-booklets, and the control group, which received leaflets. This approach allowed the analysis of pretest and posttest scores to evaluate the effectiveness of the educational media. The design was appropriate for identifying causal relationships resulting from the interventions provided.

Population and Sample

The study was conducted in February 2024 at SMA Alfatah YPKP Sentani, located in Jayapura Regency, Papua. The location was chosen due to the high prevalence of HIV/AIDS in the region and the relevance of health education programs targeting adolescents. The study was carried out on-site at the school with active collaboration from the school administration.

The study population comprised all 38 eleventh-grade social science students at SMA Alfatah YPKP Sentani. This population was selected due to its relevance to the research focus, specifically adolescents at a critical age for receiving information about HIV/AIDS. The sampling technique used was total sampling, where the entire population was included in the

study. This method was chosen because of the small population size, allowing comprehensive data collection. This approach ensured that the findings accurately represented the population.

Research Instruments

Three primary instruments were used in this study: educational media (e-booklets and leaflets) and questionnaires.

- E-Booklet: This interactive digital educational medium contains information on the definition, causes, transmission, and prevention of HIV. Health media experts validated the e-booklet in January 2024 to ensure its quality and suitability before use.
- Leaflet: This printed educational medium contained similar content to the e-booklet. It was also validated at the same time to confirm its appropriateness.
- Questionnaire: The questionnaire was used to measure respondents' knowledge and attitudes before and after the intervention. Its validity and reliability were tested at SMA Negeri 1 Sentani in January 2024.

Data Analysis

The collected data were analyzed using SPSS software. The data processing involved several steps: editing to check data completeness, coding to assign variable codes, entry to input data into the software, cleaning to ensure data accuracy, and tabulating to organize data into frequency distribution tables. These steps were undertaken to ensure the quality of the data and facilitate the analysis process.

Data analysis included univariate and bivariate analyses. The univariate analysis described the frequency distribution of independent, dependent, and confounding variables in percentage tables. The bivariate analysis employed the Wilcoxon test to examine differences in pretest and posttest scores between the intervention and control groups. Additionally, the gain index was calculated to evaluate the level of improvement in knowledge and attitudes. The gain was categorized as high, moderate, or low based on Meltzer's formula.

Ethical Considerations

The study received ethical approval from the Bioethics Committee of Medical/Health Research, Faculty of Medicine, Sultan Agung Islamic University, Semarang (Approval Number: 50/1/2024/Komisi Bioetik). All participants were provided with detailed information regarding the study's objectives, benefits, and potential risks before giving their informed consent. The research adhered to ethical principles, including maintaining confidentiality and respecting the rights of participants.

RESULTS

Development of ASSURE-Based Poster Media

The development of poster media in this study utilized the ASSURE model, consisting of six main stages:

- **Analyze Learner Characteristics (A)**

  The target audience for the educational media comprised eleventh-grade students at SMA Alfatah YPKP Sentani, aged 15–17 years. Adolescents in this age group are characterized by a high curiosity and willingness to explore new things but are also susceptible to misinformation. The media was designed to align with the learning styles of adolescents, as the effectiveness of communication is heavily influenced by how well the media suits the target audience's characteristics.

- **State Objectives (S)**

  The goal of developing this media was to enhance adolescents' knowledge and attitudes regarding HIV transmission. The intervention aimed to foster greater awareness of

personal and environmental health and enable adolescents to make better decisions in preventing HIV.

- **Select or Modify Media (S)**

  The e-booklet was selected as it is practical, easily accessible through digital devices, and designed to be interactive, capturing adolescents' attention. The leaflet was used as a comparative medium to evaluate the effectiveness of each educational method.

- **Utilize (U)**

  The e-booklet was employed over two months during counseling sessions with the intervention group, while the leaflet was distributed to the control group.

- **Require Learner Response (R)**

  Participants were asked to complete questionnaires before and after the intervention to measure changes in knowledge and attitudes.

- **Evaluate (E)**

  To ensure its feasibility, experts in media, language, and teaching evaluated the media. The evaluation revealed that the media's visual, systematic, and linguistic aspects met the required standards, although recommendations were made to enlarge the font size for better readability.

Descriptive Analysis

The study was conducted in February 2024 at SMA Alfatah YPKP Sentani, involving 38 participants. Data collection included interviews and distributing questionnaires, assisted by two midwifery students from Stikes Jayapura. Pre-data collection preparation included briefing the assistants on data collection procedures. The respondents were categorized into the intervention group (16 participants) and the control group (15 participants).

Table 1. Characteristics of Respondents at SMA Alfatah YPKP Sentani

No	Characteristics	Intervention (n=16)		Control (n=15)	
1	Adolescent Age	n	%	n	%
	Early Adolescence	0	0,0	0	0,0
	Middle Adolescence	8	50,0	4	38,7
	Late Adolescence	8	50,0	11	61,3
	Total	16	100	15	100
2	Gender	n	%	n	%
	Female	10	62,5	10	66,7
	Male	6	37,5	5	33,3
	Total	16	100	15	100

Table 1 shows that the majority of respondents were late adolescents in both the intervention and control groups. Most respondents were female in both groups, with the proportion higher in the control group.

Table 2. Distribution of Knowledge and Attitudes of Adolescents at SMA Alfatah YPKP Sentani

No	Variables	Intervention (n=16)		Control (n=15)	
1	Knowledge	n	%	n	%
	Good	8	50,0	5	33,3
	Poor	8	50,0	10	66,7
	Total	16	100	15	100

2	Attitude	n	%	n	%
	Positive	7	43,8	5	33,3
	Negative	9	56,3	10	66,7
	Total	16	100	15	100

Table 2 illustrates that a higher proportion of respondents in the intervention group demonstrated good knowledge and positive attitudes compared to the control group.

Hypothesis Testing (Wilcoxon Test)

The Wilcoxon test was employed to evaluate the effectiveness of the interventions, specifically the use of e-booklets and leaflets. This test compared pretest and posttest data to determine significant differences. The criterion for change was defined as a significance value (sig) ≤ 0.05, indicating a meaningful difference, while sig ≥ 0.05 indicated no significant difference after the intervention.

Wilcoxon Test Results for Knowledge

The Wilcoxon test for the knowledge variable assessed differences between pretest and posttest data. The results for the intervention group are as follows:

Table 3. Wilcoxon Test Results for Knowledge

Sig Value	**Intervention Posttest - Pretest**	**Control Posttest - Pretest**
Z	-3.623[b]	-1.732[b]
Asymp. Sig. (2-tailed)	.000	.083

Table 3 indicates that the intervention group, which received e-booklets, showed a Z-score of -3.623 and a sig value of 0.000, demonstrating a significant difference in knowledge before and after the intervention. Conversely, the control group, which received leaflets, had a Z-score of -1.732 and a sig value of 0.083, indicating no significant difference.

Table 4. Descriptive Statistics for Pretest and Posttest Knowledge

	N	**Min**	**Max**	**Mean**	**Std. Deviation**
Intervention Pretest	22	12	75	51.32	16.686
Intervention Posttest	22	37	81	68.09	9.952
Control Pretest	21	38	69	50.57	11.413
Control Posttest	21	38	69	51.43	11.281

Table 4 shows that the intervention group had a higher mean posttest score (68.09) than the pretest score (51.32), indicating a significant increase in knowledge after receiving the e-booklet. In the control group, the mean posttest score (51.43) was only slightly higher than the pretest score (50.57), suggesting minimal improvement. These findings demonstrate that e-booklets are more effective in enhancing knowledge than leaflets.

Wilcoxon Test Results for Attitudes

The Wilcoxon test for the attitude variable evaluated pretest and posttest differences. The results for the intervention and control groups are as follows:

Table 5. Wilcoxon Test Results for Attitudes

Sig Value	**Intervention Posttest - Pretest**	**Control Posttest - Pretest**
Z	-3.299[b]	-1.606[b]
Asymp. Sig. (2-tailed)	0,043	.108

Table 5 shows a Z-score of -3.299 and a sig value of 0.043 for the intervention group, indicating a significant difference in attitudes before and after the intervention. For the control group, the Z-score was -1.606, and the sig value was 0.108, showing no significant difference.

Table 6. Descriptive Statistics for Pretest and Posttest Attitudes

	N	Min	Max	Mean	Std. Deviation
Intervention Pretest	22	34	88	64.14	11.357
Intervention Posttest	22	55	88	72.36	7.455
Control Pretest	21	43	68	60.81	6.416
Control Posttest	21	43	72	61.90	7.375

Table 6 illustrates that the intervention group's mean attitude score increased from 64.14 in the pretest to 72.36 in the posttest, indicating a significant improvement after receiving the e-booklet. The control group showed a slight increase in mean scores, from 60.81 to 61.90, suggesting limited impact. These findings suggest that e-booklets significantly enhance knowledge and positively influence attitudes compared to leaflets, emphasizing their potential as effective educational tools.

DISCUSSION

The study findings revealed that the majority of respondents were late adolescents (17–19 years old), with females dominating in both the intervention and control groups. This result differs from the study by Cohen et al., (1993), which reported a predominance of middle adolescents (14–16 years old) over late adolescents. The difference may be attributed to the characteristics of the population and school environment, where SMA Alfatah YPKP Sentani shows a skewed age distribution favoring late adolescents. The predominance of females could reflect their higher interest in participating in health-related studies. Initial knowledge among respondents was predominantly low, with negative attitudes being more prevalent than positive ones. This highlights the limited availability of information about HIV among school adolescents. This discrepancy underscores the need for more intensive educational approaches in Papua, where access to information and educational media may be suboptimal.

The Wilcoxon test showed that the provision of e-booklets significantly improved knowledge in the intervention group compared to the control group. Respondents who received e-booklets demonstrated a more significant increase in knowledge, indicating the effectiveness of digital media in delivering health information. This finding aligns with Marnin-Distelfeld, (2020), who found that visual-based educational media, such as quartet cards, significantly improved students' knowledge. Although the control group showed slight improvement, the changes were not statistically significant, indicating that counseling without additional media was less effective. This supports the idea that interactive media, like e-booklets, enhance students' understanding and retention of educational content.

In addition to knowledge, e-booklets were effective in fostering positive attitudes toward HIV prevention. The analysis showed significant differences in attitude scores before and after the intervention in the intervention group. The increase in positive attitudes demonstrates that digital educational media can constructively influence adolescents' mindsets and behaviors. The previous research also found that educational media could promote positive attitudes among adolescents toward specific health issues (Bergsma & Carney, 2008; Levin-Zamir et al., 2011). Conversely, the control group exhibited a slight increase in attitude scores, but the changes were not significant. This highlights the importance of visual and interactive elements in influencing adolescents' attitudes.

These findings align with prior research emphasizing the importance of supplemental educational media in enhancing the effectiveness of health counseling. For example, Hazanah (2020) noted that interactive and visually engaging educational materials are more easily accepted and remembered by adolescents. Similarly, Marquart et al., (2019) demonstrated that using media positively influences knowledge and attitudes simultaneously. However, this study also revealed that the impact of e-booklets was not maximized in some aspects, such as attitude formation among groups with initially low knowledge. This indicates that media effectiveness is influenced by factors such as delivery methods, intervention duration, and the active participation of students.

CONCLUSION

This study demonstrates that e-booklets are effective educational media for improving knowledge and attitudes among adolescents at SMA Alfatah YPKP Sentani regarding HIV prevention. The majority of respondents were late adolescents and female, highlighting their potential as a target group for health education programs. The significant improvement in knowledge in the intervention group shows that e-booklets deliver information more effectively than leaflets. Furthermore, the positive attitude changes following the intervention suggest that digital educational media can influence adolescents' mindsets and behaviors regarding HIV prevention.

These findings have important implications for health education, particularly in selecting appropriate media to enhance adolescents' knowledge and attitudes. The use of e-booklets offers a practical solution to address time and accessibility constraints in health counseling. This media is not only effective but also provides adolescents with the flexibility to learn independently. The findings can serve as a reference for policymakers and health practitioners in designing more interactive technology-based educational programs. Additionally, the results encourage integrating digital educational media into school health curricula to improve the effectiveness of health education.

The limitations of this study include reliance on interviews and questionnaires, which depend on respondents' honesty and understanding when answering. The absence of direct observation posed challenges in measuring deeper behavioral aspects. Moreover, time and transportation constraints limited the study's scope. Future research should consider incorporating direct observations and extending the intervention duration to evaluate the long-term effects of educational media. Studies with larger and more diverse populations are also needed to generalize these findings.

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