

The Effectiveness of the EDHIV Game Intervention on HIV/AIDS Knowledge and Risk Behavior Among Adolescents

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Abstract. The high global and national prevalence of HIV/AIDS, particularly among the 15–24 age group, underscores the urgent need for innovative and engaging preventive education. This study aimed to analyze the effect of a new educational intervention, the EDHIV Game, on improving HIV/AIDS knowledge and reducing risk behavior among adolescents. A quasi-experimental design using a pre-test and post-test with a control group was conducted involving 156 adolescents (78 in the intervention group and 78 in the control group), primarily aged 14–16 years. The intervention group received the EDHIV Game, while the control group received standard health education. Data were collected using validated questionnaires for knowledge and self-reported risk behavior. The results showed a significant increase in knowledge scores and a significant reduction in risk behavior scores in the intervention group compared to the control group ($p < 0.001$). The EDHIV Game is statistically effective as a media-based intervention to promote comprehensive HIV/AIDS literacy. Future implementation is recommended in school-based and community-based health promotion programs targeting youth.

Keywords: HIV, AIDS, Education game, Adolescent

1 Introduction

Globally, HIV/AIDS remains a major public health concern. The WHO reported 40.1 million cumulative deaths attributed to the disease by 2021. Crucially, UNICEF data for 2020 indicated 410,000 infections among youth aged 10–24 years, with UNAIDS reporting that 1,100 young people aged 15–24 are infected daily [2]. In Indonesia, the Ministry of Health data shows a steady increase in HIV/AIDS cases, with the majority occurring in the productive age group (15–49 years) [3]. These statistics highlight the vulnerability of adolescents and young adults who are often exposed to risk factors related to sexual exploration and lack of accurate information.

Traditional health education methods, such as lectures, are frequently criticized for being passive and failing to capture the attention of digital-native adolescents. To address this gap, innovative and interactive educational media are required. Previous studies have demonstrated the efficacy of game-based interventions in enhancing HIV/AIDS knowledge and self-efficacy, including card games like the Kasaba Quartet [4] and board games like Snakes and Ladders [5] and ZIG-ZAIDS [6]. These methods leverage the engaging nature of games to facilitate better information retention and behavioral change.

This study introduces the **EDHIV Game**, a digital educational game designed specifically to address knowledge gaps and influence risk perception concerning HIV/AIDS among Indonesian adolescents. The primary objective of this study was to evaluate the effectiveness of the EDHIV Game by comparing changes in HIV/AIDS knowledge and self-reported risk behavior between an intervention group and a control group.

2 Methods

Study Design and Sample

This study employed a quasi-experimental design using a two-group (intervention and control) pre-test and post-test approach. The study population consisted of adolescents in the 10–19 age range. Purposive sampling was used to select participants, resulting in a total sample size of 156 respondents, equally divided into the Intervention Group (n=78) and the Control Group (n=78).

Instrument and Intervention

The study utilized two instruments: a knowledge questionnaire and a risk behavior questionnaire.

1. Knowledge Questionnaire: Measured facts about HIV/AIDS transmission, prevention, and treatment, with scoring based on correctness.
2. Risk Behavior Questionnaire: Measured self-reported engagement in 8 specific HIV/AIDS risk behaviors (e.g., sexual experience, condom use frequency), scored dichotomously (1=Yes/Risk; 0=No/No-Risk)^7. A total score of 8 indicated high-risk behavior, while a score of 0 indicated non-risk behavior.

The Intervention was the EDHIV Game, a digital educational game deployed over a predetermined period. The Control Group received standard print-based health education material on HIV/AIDS.

Data Analysis

Descriptive statistics (frequencies and percentages) were used for demographic data (Table 1). Inferential analysis, including the Mann-Whitney U test (due to non-normal distribution of scores) and Wilcoxon signed-rank test, was used to compare the mean rank differences in knowledge and risk behavior scores: (a) pre-test vs. post-test within each group, and (b) post-test scores between the intervention and control groups. The significance level was set at $\alpha=0.05$.

3 Results And Discussion

3.1 Results

The inferential analysis showed the following key findings:

1. Change in Knowledge: The Wilcoxon test indicated a highly significant increase in knowledge scores in the Intervention Group (Mean Rank Increase =45.21;p<0.001). In contrast, the Control Group showed only a minor, non-significant increase. The Mann-Whitney U test comparing the post-test knowledge scores revealed that the Intervention Group's scores were significantly higher than the Control Group's (p<0.001).
2. Change in Risk Behavior: Similarly, the Intervention Group exhibited a significant improvement in risk behavior scores (Mean Rank Decrease =38.90;p<0.001), reflecting a reduction in self-reported risk practices (i.e., scores moved closer to 0). The Control Group showed no significant change. The comparison of post-test risk behavior scores using the Mann-Whitney U test confirmed that the Intervention Group had significantly lower risk behavior scores (p<0.001).

Table 1. Demographic data

Variables	N = 78	%
Age		
10 – 13 years	1	1
14 - 16 years	51	65
17 – 19 years	26	34
Sex		
Male	28	36
Female	50	64
School Area		
City	66	84
Regency	12	16
Religion		
Islam	76	97

Non Islam	2	3
Total	78	100.00

3.2 Discussion

The findings of this study, the statistical results strongly support the hypothesis that the EDHIV Game is an effective tool for HIV/AIDS prevention education among adolescents. The significant differences observed in both knowledge and risk behavior between the intervention and control groups underscore the superiority of interactive, game-based learning over traditional methods.

The game's success can be attributed to several factors consistent with existing literature:

1. **Engagement and Motivation:** Digital games are inherently engaging for the target demographic, improving their motivation and participation in learning complex or sensitive topics [8]. This aligns with findings that educational games, such as The Kasaba Quartet and ZIG-ZAIDS, are more effective than standard lectures in increasing knowledge and self-efficacy [4,6].
2. **Experiential Learning:** The EDHIV Game likely facilitates learning through scenarios and decision-making simulations, enabling adolescents to understand the consequences of high-risk behavior in a safe, virtual environment. This practical application of knowledge is a key mechanism for promoting behavioral change [5]. Additionally, gamification approaches in school-based health programs have been identified as effective in promoting positive educational outcomes [11].
3. **Reducing Stigma:** By providing comprehensive and non-judgmental information, the game likely contributes to a reduction in stigma, which is a major barrier to seeking prevention and testing services [7].

Although this study confirms the game's efficacy, it is limited by its quasi-experimental design and the reliance on self-reported risk behavior. Future research should consider a Randomized Control Trial (RCT) and include objective measures or longer-term follow-up to assess the sustainability of behavioral change.

Table 2. Inferential Analysis

Variable	Group	Pre-test Score (Mean ± SD)	Post-test Score (Mean ± SD)	Δ Change Score	p-value (Between Groups Post-test)
Knowledge	Intervention (n=78)	65.8±10.2	91.5±5.1	+25.7	<0.001
	Control (n=78)	66.1±10.5	70.2±9.8	+4.1	
Risk Behavior	Intervention (n=78)	4.9±1.2	2.1±0.8	−2.8	<0.001
	Control (n=78)	5.0±1.3	4.8±1.1	−0.2	

4 Conclusion

The EDHIV Game intervention significantly improves HIV/AIDS knowledge and reduces self-reported risk behavior among adolescents. This digital educational tool is a viable, innovative, and highly effective strategy that public health practitioners and educators should utilize to address the persistent challenge of HIV/AIDS prevention among youth. We recommend the integration of the EDHIV Game into reproductive health and public health literacy programs targeting adolescents.

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