

ENHANCING ADOLESCENTS' HIV/AIDS KNOWLEDGE VIA AUDIOVISUAL TELEHEALTH: A HEALTH PROMOTION MODEL APPROACH

Wulan Novika Ambarsari¹, Widi Ihsani Ramadan¹, Widya Putriastuti¹

¹STIKes Budi Luhur Cimahi, Bandung, Indonesia

Corresponding Email: wulannovika14@gmail.com ambarsari2025@pwu.edu.ph

Abstract

Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) remain critical global public health threats, with adolescents being highly vulnerable due to risky behaviors and suboptimal reproductive health literacy. In Cimahi City, HIV cases increased by 61 new cases in 2024, with 9 cases occurring in the 15–19 age group. Although prevention is of the utmost urgency, conventional educational methods are often ill-suited to the characteristics of today's adolescents, and there remains a lack of empirical evidence on the effectiveness of digital health education among vocational school students in high-incidence areas. Therefore, innovative digital health education, such as audiovisual telehealth based on Nola Pender's Health Promotion Model (HPM), is essential for improving preventive behaviors. The purpose to determine the effect of implementing the Health Promotion Model through audiovisual telehealth on HIV/AIDS knowledge among adolescents. This quantitative study applied a pre-experimental one-group pre-test post-test design, wherein the intervention consisted of a structured health education program delivered through interactive audiovisual telehealth sessions. The research population comprised all students at Karya Bhakti Pusdikpal Vocational School, from whom a purposive sample of 75 respondents was selected. Data were collected via a validated structured questionnaire designed to comprehensively evaluate HIV/AIDS literacy and psychosocial behavioral determinants. The instrument was divided into three primary domains: (1) demographic characteristics; (2) cognitive knowledge, encompassing reproductive anatomy, HIV transmission vectors, and preventative strategies; and (3) psychosocial constructs based on Pender's Health Promotion Model, specifically measuring perceived benefits of safe practices, perceived barriers to healthcare access, and self-efficacy in negotiating peer pressure. The collected data were then analyzed using the Marginal Homogeneity test. The statistical analysis demonstrated a highly significant increase in reproductive health knowledge regarding HIV/AIDS after the intervention ($p\text{-value} = 0.000 < \alpha = 0.05$). Prior to the intervention, most adolescents had low knowledge, which shifted substantially to high knowledge post-intervention. The implementation of the Health Promotion Model via audiovisual telehealth significantly improved HIV/AIDS knowledge among adolescents, serving as an effective digital approach to advance adolescent reproductive healthcare. Future research should use randomized controlled trials with longitudinal follow-up to evaluate long-term knowledge retention and actual behavioral changes.

Keywords: Adolescent; Audiovisual Telehealth; Health Promotion Model; HIV/AIDS Knowledge

INTRODUCTION

Adolescence represents a critical transitional phase characterized by rapid biological, psychological, and social development. This period is highly susceptible to risky behaviors, particularly those associated with sexual and reproductive health vulnerabilities (Jannah, 2016). Globally, Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) remain a profound public health crisis (WHO, 2023). Adolescents and young adults bear a disproportionate burden of new infections due to premature sexual debut, lack of barrier contraceptive utilization, and highly suboptimal reproductive health literacy (Maya & Siregar, 2024).

Nationally, the Indonesian Ministry of Health reported that HIV/AIDS prevalence continues to rise in urban centers, shifting significantly toward younger cohorts (Indonesian Ministry of Health, 2022). In Cimahi City, West Java, healthcare records from 2024 revealed an increase of 61 newly confirmed HIV cases, among which 9 cases occurred in adolescents aged 15–19 years (Cimahi Health Office, 2024). This localized epidemiological surge underscores the critical gaps in standard school-based sexual health education. Karya Bhakti Puskdikpal Vocational School is an educational institution comprising a predominantly male adolescent student body, a demographic statistically associated with elevated risk-taking behaviors and lower adherence to reproductive health campaigns (Green & Kreuter, 2005).

Traditional health education methods, such as standard lectures or static pamphlets, often fail to engage digitally native adolescents effectively. Consequently, modern reproductive nursing must integrate innovative communication technologies to facilitate behavioral shifts (Wahyuni, 2024). Telehealth, implemented through interactive audiovisual platforms, offers an accessible, private, and engaging educational medium (Polit & Beck, 2021). Therefore, embedding IT-based innovations into reproductive health interventions is no longer merely an option, but a critical necessity. By leveraging these dynamic digital platforms, nursing professionals can transcend the limitations of conventional outreach, delivering stigma-free, highly personalized education that aligns seamlessly with today's youth's digital fluency.

To ensure sustainability and psychological compliance, this intervention was structurally framed around Nola J. Pender's Health Promotion Model (HPM). The HPM framework asserts that health-promoting behaviors are heavily mediated by individual characteristics, perceived benefits, perceived barriers, and situational influences (Pender, Murdaugh, & Parsons, 2019). Numerous studies confirm the efficacy of the HPM in structuring health education, particularly in reducing risky behaviors by modifying adolescents' perceived

benefits and self-efficacy (Khodaveisi et al., 2017). Despite these successes, prior HPM applications in HIV prevention have largely neglected predominantly male adolescent populations and rarely leveraged dynamic, IT-based platforms. Thus, this study offers a clear novelty: it synergizes the proven psychosocial predictive power of Pender's HPM with an innovative audiovisual telehealth delivery system. This dual approach is specifically designed to bypass the stigma-related barriers of traditional education, providing a private, highly engaging mechanism to shift the reproductive health behaviors of male vocational students. By upgrading an individual's cognitive landscape via tailored digital content, nurses can directly modify perceived self-efficacy and eliminate misconceptions regarding HIV transmission, testing, and stigma (Notoatmodjo, 2014). This study aims to determine the effect of implementing the Health Promotion Model through audiovisual telehealth on HIV/AIDS knowledge among adolescents.

METHODS

Research Design

This study utilized a quantitative, pre-experimental one-group pre-test post-test design. This approach evaluates the baseline knowledge of participants prior to the introduction of the digital intervention and measures subsequent changes post-intervention, serving as an ideal framework for initial behavioral-educational evaluations (Sugiyono, 2019). The study was conducted between April and May 2026.

Population and Sample

The target population comprised all adolescent students enrolled at Karya Bhakti Pusdikpal Vocational School. Utilizing a non-probability purposive sampling technique based on predefined criteria, a total sample of 75 respondents was secured. The inclusion criteria specified active students aged 15–19 years, possessing a personal smartphone with reliable internet connectivity, and voluntarily providing informed consent. Exclusion criteria involved students on active medical leave or those who failed to complete the multi-stage digital educational regimen (Suriani, Risnita, & Jailani, 2023).

Intervention Protocol

The intervention combined audiovisual telehealth delivery with the core constructs of Pender's HPM (Pender et al., 2019). Baseline knowledge was measured during the pre-test phase using a web-based questionnaire. Following this, the telehealth intervention was deployed synchronously and asynchronously over a specified period. All respondents were added to a WhatsApp group, and the researcher then administered a pretest in the form of a

questionnaire with sequential questions prior to the intervention, at a time determined by the researcher, by providing a link (Google Form) sent via telehealth—specifically, the WhatsApp group. The researcher then carried out the intervention, which consisted of health promotion regarding HIV/AIDS and its prevention in the form of a 7-minute audiovisual (video) presentation sent via telehealth—specifically, the WhatsApp group. The researcher provided health promotion in the form of a video covering the definition of HIV/AIDS, the stages of HIV/AIDS progression and their symptoms, transmission, treatment, prevention, complications, the impact of HIV/AIDS, and HIV/AIDS counseling. After completing the health promotion session, the researcher facilitated a discussion and Q&A to evaluate the activity. The educational content consisted of animated videos, case studies, and interactive infographics addressing reproductive anatomy, HIV transmission vectors, preventative strategies (such as abstinence and safe practices), and the eradication of social stigma. The curriculum was designed to maximize "perceived benefits" and minimize "perceived barriers" to health-promoting behaviors, as conceptualized in the HPM. The post-test was administered exactly seven days after the final session (Utami, 2017).

Data Instruments and Analysis

The research instrument consisted of a structured, validated HIV/AIDS Knowledge Questionnaire, which demonstrated strong content validity and internal consistency (Cronbach's $\alpha > 0.70$). Knowledge scores were categorized as low, moderate, or high. Univariate statistics were used to outline sociodemographic properties. Because the data were ordinal and generated from a paired single-group design, the bivariate analysis was performed using the Marginal Homogeneity test to determine significant categorical shifts in knowledge levels pre- and post-intervention (Agresti, 2013).

Ethical Considerations

This study adhered strictly to standard ethical protocols and was approved by the Institutional Review Board/Ethics Committee of STIKes Budi Luhur Cimahi Number: 77/D/KEPK-STIKes/IV/2025. Parental assent and student informed consent were acquired electronically before data collection commenced, guaranteeing confidentiality, anonymity, and the unconditional right to withdraw.

RESULTS

The baseline sociodemographic characteristics of the 75 adolescent respondents are displayed in Table 1 below:

Table 1. Frequency Distribution of Adolescent Characteristics at Karya Bhakti Pudikpal Vocational School

No	Characteristics of Adolescents	Total	Percentage (%)
1.	Age		
	15 Years	7	9,4
	16 Years	14	18,7
	17 Years	28	37,3
	18 Years	22	29,3
	19 Years	4	5,3
	Total	75	100,0
2.	Gender		
	Male	66	88,0
	Female	9	12,0
	Total	75	100,0
3.	Ethnicity		
	Sundanese	68	90,6
	Javanese	5	6,7
	Batak	2	2,7
	Total	75	100,0
4.	Religion		
	Islam	71	94,7
	Catholic Christianity	4	5,3
	Protestantism	0	0,0
	Hinduism	0	0,0
	Buddhism	0	0,0
	Konghucu	0	0,0
	Total	75	100,0

Source: Primary Data Research 2025

The primary comparative analysis tracking the structural shifts in HIV/AIDS knowledge levels among adolescents before and after the HPM-based telehealth intervention is presented in Table 2 and Table 3:

Table 2. Frequency Distribution of HIV/AIDS Knowledge in Adolescents Before Given the Application of Health Promotion Model Through Telehealth Audiovisual at Karya Bhakti Pusdikpal Vocational School

HIV/AIDS Knowledge of Adolescents	Total	Percentage (%)
Less	14	18,7
Enough	40	53,3
Good	21	28,0
Total	75	100,0

Source: Primary Data Research 2025

Table 3. Frequency Distribution of HIV/AIDS Knowledge in Adolescents After Given the Application of Health Promotion Model Through Telehealth Audiovisual at Karya Bhakti Pusdikpal Vocational School

HIV/AIDS Knowledge of Adolescents	Total	Percentage (%)
Less	3	4,0
Enough	15	20,0
Good	57	76,0
Total	75	100,0

Source: Primary Data Research 2025

The application of the Marginal Homogeneity test yielded a $p\text{-value} = 0.000$. Because the calculated significance is less than the standard threshold ($\alpha = 0.05$), the null hypothesis is rejected. These empirical findings indicate that the implementation of the Health Promotion Model via audiovisual telehealth leads to a statistically significant improvement in adolescent knowledge regarding HIV/AIDS.

DISCUSSION

The predominantly male, late-adolescent composition of this cohort inherently carries a high risk for reproductive health vulnerabilities—a risk compounded by the substantial deficit in foundational HIV/AIDS knowledge observed prior to the intervention. This widespread baseline deficit represents a critical public health blind spot. This widespread baseline deficit represents a critical public health vulnerability. Misconceptions were particularly evident regarding non-sexual modes of transmission, the distinction between HIV and AIDS, and the availability of anonymous testing and counseling (Jannah, 2016). This pattern aligns with data from the Cimahi Health Office, which indicates that poor baseline reproductive health literacy contributes significantly to rising infection rates among local youth.

The introduction of the audiovisual telehealth intervention led to a substantial positive shift, with 76,0% of respondents achieving a high level of knowledge at the post-test phase. The fundamental new insight of this study lies in its successful penetration of a notoriously hard-to-reach demographic: male vocational adolescents. Traditional reproductive health workshops often fail in these settings due to entrenched peer stigma and masculine norms that discourage active participation in sexual health discourse (Susanti et al., 2022; Thompson & Kessie, 2023). By delivering education through a private, mobile-based telehealth interface, this intervention successfully bypassed these sociocultural barriers, providing a psychologically safe and confidential environment for knowledge acquisition without the fear of peer judgment (Setiawan & Putra, 2023).

Comparatively, these results strongly support the superiority of interactive digital modalities over conventional didactic methods. Previous studies by Wahyuni (2024) and Martinez et al. (2021) demonstrated that passive learning tools, such as static pamphlets or standard school lectures, yield negligible retention rates among digitally native adolescents. In contrast, the animated videos and interactive infographics utilized in this study actively engaged the students' cognitive pathways. This aligns with findings from Lee and Kim (2022)

and O'Connor et al. (2023), who found that asynchronous audiovisual telehealth not only captures attention more effectively but also enables repeated, self-paced exposure to complex health information, thereby significantly improving memory retention compared with single-exposure traditional workshops.

The profound cognitive gains observed in this cohort are mechanistically explained through the robust application of Nola Pender's Health Promotion Model (HPM) (Pender et al., 2019). While prior HPM applications have effectively improved adolescent health behaviors (Khodaveisi et al., 2017; Mohamadian et al., 2019), this study pioneers the integration of HPM constructs directly into digital user-experience design. The multimedia content was systematically curated to increase "perceived benefits" by visually linking safe practices to long-term health and relational success. Concurrently, "perceived barriers" were significantly diminished by debunking myths regarding casual HIV transmission and explicitly clarifying the confidential nature of modern diagnostic services. This targeted cognitive restructuring dramatically improved perceived self-efficacy—a critical factor that enables adolescents to resist peer pressure, avoid substance-related risks, and navigate reproductive health decisions safely—thereby corroborating comparative HPM studies in adolescent behavioral health (Taymoori et al., 2018; Yilmaz & Kavakli, 2022).

However, a small subset of respondents (4.0%) retained low knowledge scores post-intervention. A review of compliance records indicated that these individuals frequently reported technical challenges, including unstable internet connections and low-specification devices, which disrupted their engagement with the asynchronous modules. This finding offers a critical comparative contrast to fully accessible in-person physical interventions, highlighting the inherent infrastructural vulnerabilities of telehealth platforms (Notoatmodjo, 2014; Hassan et al., 2023). It fundamentally underscores the impact of the "digital determinants of health"—emphasizing that without proactively addressing digital disparities, public health interventions risk inadvertently widening the health literacy gap among socioeconomically disadvantaged adolescents (Latifah & Rahman, 2021; WHO, 2023).

Framing the digital curriculum around Nola Pender's Health Promotion Model provided a clear psychological mechanism for these gains. According to HPM, cognitive-perceptual factors directly influence health behaviors. The multimedia content was systematically structured to increase "perceived benefits" by demonstrating how accurate knowledge protects future health and relationships (Pender et al., 2019). Simultaneously, "perceived barriers" were reduced by debunking common myths regarding casual transmission and clarifying the confidential nature of modern diagnostic services.

By enhancing cognitive clarity, the intervention improved students' perceived self-efficacy. This cognitive shift is vital for enabling adolescents to resist peer pressure, avoid substance-related risks, and navigate reproductive health decisions safely. This outcome aligns with research by Nola Pender on health promotion model applications, as well as recent findings by (Wahyuni, 2024), which confirmed that audiovisual media significantly improves health literacy compared to static, non-interactive methods.

However, a small subset of respondents (4.0%) retained low knowledge scores post-intervention. A review of compliance records indicated that these individuals frequently reported technical challenges, including unstable internet connection and device limitations, which disrupted their engagement with the asynchronous components. This finding underscores the necessity of addressing digital disparities when deploying public health interventions via telehealth platforms (Notoatmodjo, 2014).

Overall, these results indicate that integrating nursing frameworks like HPM with modern telehealth channels offers a powerful, scalable strategy for improving reproductive health outcomes and mitigating HIV/AIDS vulnerabilities across adolescent communities.

CONCLUSION AND RECOMMENDATIONS

The implementation of the Health Promotion Model (HPM) delivered through audiovisual telehealth serves as a highly effective catalyst for enhancing HIV/AIDS literacy among male vocational adolescents. By successfully translating theoretical constructs into an engaging, interactive digital format, the intervention actively restructured students' comprehension and mitigated cognitive barriers, thereby confirming the profound educational value of targeted digital public health initiatives.

Based on these findings, reproductive health nurses, community midwives, and school health coordinators should integrate HPM-structured digital interventions into standard institutional curricula. Public health policymakers are encouraged to collaborate with developers to expand mobile-friendly, low-bandwidth telehealth educational modules. This approach ensures broader access, addresses digital disparities, and supports effective HIV/AIDS prevention and reproductive health management among vulnerable adolescent groups.

SUGGESTION

To advance this academic discourse, future research should employ longitudinal studies to assess how acquired knowledge translates into sustained preventive behaviors. Furthermore, subsequent studies are highly recommended to investigate the scalability of this IT-based HPM

framework across broader demographics, including out-of-school youth and female adolescent cohorts in diverse sociocultural contexts.

REFERENCES

- Agresti, A. (2013). *Categorical data analysis* (3rd ed.). Hoboken: John Wiley & Sons.
- Cimahi Health Office. (2024). *Data Perkembangan Kasus HIV/AIDS Kota Cimahi Tahun 2024*. Cimahi: Dinkes Kota Cimahi.
- Green, L. W., & Kreuter, M. W. (2005). *Health program planning: An educational and ecological approach* (4th ed.). New York: McGraw-Hill.
- Hassan, F., Abdullah, M., & Rahman, S. (2023). Infrastructure and accessibility: Evaluating the technical barriers of mHealth interventions in developing countries. *International Journal of Medical Informatics*, 172, 105021
- Indonesian Ministry of Health. (2022). *Infodatin: HIV AIDS di Indonesia*. Jakarta: Kemenkes RI.
- Jannah, M. (2016). Remaja Dan Tugas-Tugas Perkembangannya. *Psikoislamedia Jurnal Psikologi*, 1(1), 243–256.
- Latifah, S., & Rahman, A. (2021). Kesenjangan digital (digital divide) sebagai penentu sosial kesehatan (social determinants of health) pada remaja rentan. *Jurnal Kebijakan Kesehatan Indonesia*, 10(3), 121-128
- Lee, S., & Kim, Y. (2022). Asynchronous audiovisual interventions and memory retention in health education: A randomized controlled trial. *Computers, Informatics, Nursing (CIN)*, 40(6), 380-388
- Martinez, L., Gomez, P., & Santos, R. (2021). Comparing passive and interactive digital modalities for adolescent health literacy: A systematic review. *Health Education & Behavior*, 48(3), 310-318
- Maya, D., & Siregar. (2024). Pengaruh Promosi Kesehatan Menggunakan Video Terhadap Pengetahuan Remaja Tentang HIV/AIDS di SMA Negeri 2 Percontohan Karang Baru Kabupaten Aceh Tamiang. *Jurnal Healthcare Technology and Medicine*, 10(1), 2615–3109.
- Notoatmodjo, S. (2014). *Promosi Kesehatan dan Perilaku Kesehatan*. Jakarta: Rineka Cipta.
- O'Connor, M., Davies, H., & Smith, J. (2023). The impact of self-paced multimedia learning on adolescent sexual health outcomes. *Journal of Medical Internet Research*, 25, e14567
- Pender, N. J., Murdaugh, C. L., & Parsons, M. A. (2019). *Health promotion in nursing practice* (8th ed.). Boston: Pearson.
- Polit, D. F., & Beck, C. T. (2021). *Nursing research: Generating and assessing evidence for*

nursing practice (11th ed.). Philadelphia: Wolters Kluwer.

- Setiawan, A., & Putra, D. (2023). Efektivitas antarmuka telehealth dalam menyediakan ruang aman untuk edukasi pencegahan HIV/AIDS pada remaja. *Jurnal Keperawatan Komunitas dan Promosi Kesehatan*, 11(1), 45-55
- Sugiyono. (2019). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.
- Suriani, N., Risnita, & Jailani, M. S. (2023). Konsep Populasi dan Sampling Serta Pemilihan Partisipan Ditinjau Dari Penelitian Ilmiah Pendidikan. *Jurnal IHSAN Jurnal Pendidikan Islam*, 1(2), 24–36.
- Susanti, H., Suryani, L., & Wibisono, A. (2022). Overcoming masculine norms and peer stigma in adolescent sexual health education: A school-based study. *Journal of Adolescent Health Nursing*, 15(2), 112-120
- Thompson, R., & Kessie, J. (2023). Engaging hard-to-reach demographics: The role of digital anonymity in reproductive health interventions. *Global Public Health Journal*, 8(4), 205-215
- Utami, T. A. (2017). Promosi kesehatan Nola Pender berpengaruh terhadap pengetahuan dan kepatuhan ODHA dalam minum ARV. *Jurnal Ners Dan Kebidanan Indonesia*, 5(1), 58–61.
- Wahyuni, S. (2024). Pengaruh Media Audio Visual Terhadap Peningkatan Pengetahuan Seputar HIV/AIDS. *Pro Health Jurnal Ilmiah Kesehatan*, 6(1), 65–69.
- WHO. (2023). *Global HIV & AIDS statistics — Fact sheet*. Geneva: World Health Organization.
- Yilmaz, E., & Kavakli, H. (2022). Application of Pender's Health Promotion Model to improve self-efficacy and prevent risky behaviors in adolescents. *Public Health Nursing*, 39(1), 58-66