

Health literacy as a determinant of HIV/AIDS preventive behavior: A cross-sectional study among university students in Yogyakarta, Indonesia

*Literasi kesehatan sebagai penentu perilaku pencegahan HIV/AIDS:
Studi potong lintang pada mahasiswa di Yogyakarta, Indonesia*

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Abstract

Previous studies have shown a general association between health literacy and HIV/AIDS prevention behaviors; however, few have focused specifically on university students in educational hubs such as Yogyakarta, Indonesia. Moreover, the role of digital access and socio-cultural context in shaping student health literacy remains underexplored. This study aimed to analyze the relationship between health literacy levels and HIV/AIDS prevention behavior among university students in Yogyakarta. A cross-sectional analytical design was used involving 133 students recruited through consecutive sampling between May 5–23, 2025. Data were collected via a structured online questionnaire measuring both health literacy and HIV/AIDS prevention behavior. Bivariate analysis was conducted using the Chi-Square test. The findings revealed a statistically significant association between health literacy and HIV/AIDS prevention behavior ($p = 0.000$). Students with higher health literacy were substantially more likely to engage in preventive behaviors, including safe sex practices and HIV testing, than those with low health literacy. This study reinforces the critical role of health literacy in influencing HIV/AIDS prevention among university students. The findings support the integration of health literacy education into academic programs as a public health strategy. Health professionals and policymakers should prioritize targeted literacy interventions to enhance health behaviors among youth populations.

Abstrak

Studi sebelumnya menunjukkan adanya hubungan antara literasi kesehatan dan perilaku pencegahan HIV/AIDS, namun sangat sedikit yang secara spesifik meneliti populasi mahasiswa di kota pendidikan seperti Yogyakarta, Indonesia. Selain itu, peran akses digital dan konteks sosial budaya dalam membentuk literasi kesehatan mahasiswa masih belum banyak dikaji. Penelitian ini bertujuan untuk menganalisis hubungan antara tingkat literasi kesehatan dengan perilaku pencegahan HIV/AIDS pada mahasiswa di Yogyakarta. Desain penelitian analitik dengan pendekatan potong lintang dilakukan pada 133 mahasiswa yang dipilih secara consecutive sampling selama periode 5–23 Mei 2025. Instrumen berupa kuesioner daring terstruktur mengukur literasi kesehatan dan perilaku pencegahan HIV/AIDS. Analisis bivariat menggunakan uji Chi-Square. Hasil menunjukkan adanya hubungan yang signifikan secara statistik antara tingkat literasi kesehatan dan perilaku pencegahan HIV/AIDS ($p = 0.000$). Mahasiswa dengan literasi kesehatan tinggi lebih cenderung memiliki perilaku pencegahan yang baik, seperti praktik seks aman dan tes HIV secara berkala. Penelitian ini menegaskan pentingnya literasi kesehatan dalam memengaruhi perilaku pencegahan HIV/AIDS pada mahasiswa. Hasil ini mendukung integrasi pendidikan literasi kesehatan dalam kurikulum perguruan tinggi sebagai strategi kesehatan masyarakat. Tenaga kesehatan dan pembuat kebijakan perlu memprioritaskan intervensi literasi yang terarah untuk meningkatkan perilaku sehat di kalangan generasi muda.

Keywords :

acquired immunodeficiency syndrome; health behavior; health literacy; universities; students

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INTRODUCTION

Global initiatives aimed at preventing HIV/AIDS have intensified, particularly in response to the Sustainable Development Goals (SDGs) and the guidance from the World Health Organization (WHO). The SDG 3 targets aim to end the AIDS epidemic by 2030, necessitating comprehensive strategies encompassing health education, access to testing, and integrated care approaches (Gountas et al., 2023). A multi-faceted approach involving community empowerment and gender equality is central to these efforts, particularly in vulnerable populations such as women (Dewi et al., 2021; Khan, 2024).

Furthermore, the UNAIDS "95-95-95" strategy highlights the need for continuous monitoring of incidence, mortality, and prevalence to track progress towards curbing the epidemic (Gountas et al., 2023; Mirkuzie et al., 2021). While variations in the implementation of HIV testing guidelines pose challenges at local levels (Colón-López et al., 2022), initiatives advocating for mental health integration in HIV treatment further enhance service delivery effectiveness in resource-limited settings (Ramokanate et al., 2023). Regional cooperation, especially in Southern Africa, is essential to accelerate progress towards global health targets (Gona et al., 2020).

The infectious disease HIV/AIDS has developed rapidly and become a global health problem requiring urgent attention (Kusumaadhi et al., 2021). In 2023, around 630,000 people globally died due to HIV-related causes, while 1.3 million people acquired the virus (UNAIDS, 2024). In Indonesia alone, 57,299 HIV cases and 16,410 AIDS cases were reported in 2023, predominantly among those aged 20–49 years—the most productive age group and most vulnerable to risky behaviors such as unsafe sex and injecting drug use (Ministry of Health of the Republic of Indonesia, 2023).

Health literacy is a crucial determinant of health behavior, especially regarding sexually transmitted infections (STIs). It encompasses the ability to access, understand, and utilize health information effectively (Rashidi et al., 2023; Marshall et al., 2024). Research shows that higher levels of sexual health literacy positively influence decision-making and promote safer sexual practices, especially for marginalized populations (McDaid et al., 2020; Harsch et al., 2021). Age, education, and socio-economic status are significant predictors of health literacy and, subsequently, sexual health behavior (Panahi et al., 2021; Rakhshaee et al., 2020).

University students represent a critical demographic in HIV prevention strategies. Despite increased access to health information, many students still demonstrate inconsistent condom use and low HIV testing uptake (Seif et al., 2025; Ratnawati et al., 2024). Interventions like problem-based learning and interactive workshops have shown promise in enhancing HIV/AIDS knowledge and preventive behaviors among students (Zhang et al., 2022; Liu et al., 2020). Nonetheless, socio-economic disparities and digital literacy levels continue to shape students' health-seeking behaviors (Yang et al., 2022).

In Indonesia, the role of health literacy in HIV prevention is increasingly recognized, but significant challenges remain. Outreach efforts in regions such as South Sulawesi have yielded some success (Syafar et al., 2024), yet the broader development of health literacy, especially in academic settings, is still limited. Digital health platforms show potential but often fail to reach all target groups due to infrastructural and cultural barriers (Kolifah et al., 2024; Jahangir et al., 2020).

Although several studies have addressed the correlation between health literacy and HIV preventive behaviors globally (Amanu et al., 2023; Manwong et al., 2022; Naveed & Shakurat, 2022), there is a lack of context-specific analysis among university students in Indonesia, particularly in educational hubs like Yogyakarta. Prior studies often focus on general population groups or healthcare settings, without isolating the influence of health literacy within student populations experiencing rapid behavioral and cognitive development. Moreover, few studies simultaneously examine health literacy and its behavioral impact using validated frameworks in this demographic. Therefore, this study aims to bridge this gap by examining the relationship between health literacy levels and HIV/AIDS prevention behaviors among university students in Yogyakarta. This contribution is expected to support the design of targeted, literacy-based interventions that align with local educational and socio-cultural contexts.

METHODS

This study employed an analytical observational design using a cross-sectional approach to examine the relationship between health literacy levels and HIV/AIDS prevention behavior among university students in Yogyakarta, Indonesia. Yogyakarta was selected as the research site due to its status as a major educational hub in Indonesia, hosting a high density of university students from

Table 1. Distribution of respondents based on gender

Gender	n	%
Male	20	15
Female	113	85

diverse socioeconomic and cultural backgrounds. This makes the region a strategic setting for public health research targeting youth behaviors, particularly in relation to sexual health and literacy. The study was conducted over a period of 18 days, from May 5 to May 23, 2025.

The population for this study comprised all students currently enrolled in universities across Yogyakarta. A total of 133 students were recruited as respondents using consecutive sampling, which involves selecting participants who meet inclusion criteria as they become available, until the required sample size is achieved. The inclusion criteria were: (1) currently enrolled as a university student in Yogyakarta, (2) aged 18 years or older, (3) willing to voluntarily participate, and (4) able to access and complete the online questionnaire independently. The research instrument was a structured questionnaire developed via Google Form, comprising closed-ended questions designed to measure two main constructs: health literacy level and HIV/AIDS prevention behavior. Key items included questions about the ability to access and understand sexual health information, evaluate online health sources, knowledge of HIV transmission routes, condom usage, HIV testing history, and decision-making skills related to safe sexual practices.

Data collection was conducted online through a link distributed by the research team to various student networks. The data management process involved exporting responses into Microsoft Excel and subsequently analyzing the data using IBM SPSS version 25. Univariate analysis was performed to describe the frequency distribution of demographic variables and key study variables, while bivariate analysis using the Chi-Square test was employed to assess the association between health literacy level and HIV/AIDS prevention behavior. All respondents were provided with an online informed consent form prior to participation, which outlined the purpose of the study, procedures, voluntary nature of involvement, confidentiality assurance, and contact information for further inquiries. Ethical clearance for the study was granted by the Institutional Review Board of the Faculty of Public Health, Universitas Islam Negeri Alauddin Makassar.

RESULTS

Table 1 presents the frequency distribution of respondents based on gender. Of the total 133 respondents, the majority were female, comprising 113 individuals (85%), while the remaining 20 respondents (15%) were male.

Table 2 illustrates the relationship between health literacy levels and HIV/AIDS prevention behavior. Among the 113 respondents with high health literacy, 109 individuals (96.5%) exhibited good HIV/AIDS prevention behavior, while only 4 individuals (3.5%) demonstrated poor prevention behavior. Conversely, all 20 respondents (100%) with low health literacy exhibited poor prevention behavior. The Chi-Square test yielded a p-value of 0.000, indicating a statistically significant association between health literacy level and HIV/AIDS prevention behavior among university students in Yogyakarta.

DISCUSSION

The findings of this study demonstrate a statistically significant relationship between health literacy levels and HIV/AIDS prevention behavior among university students in Yogyakarta ($p = 0.000$). Specifically, students with high health literacy were significantly more likely to engage in positive HIV prevention behaviors, such as condom use and regular HIV testing, compared to those with low health literacy. These findings reinforce the role of health literacy as a key determinant of health behavior, especially within a young adult population navigating sexual health risks and decision-making autonomy.

The positive relationship between health literacy and HIV/AIDS prevention has been extensively documented across various studies, illustrating its importance in enhancing preventive behaviors, knowledge acquisition, and risk perception among diverse populations. Kolifah et al. found that e-health literacy interventions significantly improved preventive behaviors regarding HIV/AIDS among punk teenagers in Indonesia, aligning with the Health Belief Model, which emphasizes the role of education in fostering behavioral change (Kolifah et al., 2024). This suggests that targeted educational programs can mobilize health literacy as a protective factor against HIV transmission. Similarly,

Table 2. Relationship between health literacy level and HIV/AIDS prevention behavior

Health Literacy Level	HIV/AIDS Prevention Behavior				p-value
	Good		Less		
	n	%	n	%	
High	109	96.5	4	3.5	0.000
Low	0	0	20	100	

Gilan et al. reported a positive association between AIDS health literacy and risk perception among adolescents, indicating that improved literacy mitigates barriers to healthcare access and enhances adherence to preventive strategies (Gilan et al., 2021).

Educational background also plays a central role in shaping health literacy. Kene et al. highlighted that health science students exhibited significantly higher HIV knowledge levels than their non-health peers, reinforcing the influence of academic exposure on prevention behaviors (Kene et al., 2021). Qiu and Wu further demonstrated the effectiveness of mobile-based interventions, such as WeChat, in increasing HIV knowledge and reducing stigma among female university students in China (Qiu & Wu, 2022). These findings highlight the utility of digital platforms in extending the reach of health literacy initiatives, particularly in tech-savvy student populations.

The integration of health literacy-focused programs into both curricula and co-curricular activities is increasingly seen as essential in building a well-informed student body. Multiple studies support this view, showing that health literacy facilitates informed decision-making and helps reduce the risk of HIV transmission (Kolifah et al., 2024; Gilan et al., 2021; Kene et al., 2021; Qiu & Wu, 2022). Moreover, individuals with sufficient health literacy tend to be more proactive in seeking and utilizing health information and services, including regular check-ups and STI screenings (Huang et al., 2021; Tang & Wang, 2023). This behavior is consistent with findings that greater health information literacy leads to more frequent and effective information-seeking actions that promote health protection.

Beyond physical health, mental health literacy also plays a significant role in shaping health-seeking behavior. Students who are more literate about mental health are better informed about available resources and more likely to seek professional help when needed (Nurazizah & Zulkaida, 2024; Iswanto & Ayubi, 2023). Systematic reviews confirm that individuals with higher health literacy are generally more likely to adopt preventive behaviors and experience better health outcomes (Amoah et al., 2022; Kim et al., 2023).

These insights support the importance of integrating comprehensive literacy approaches into HIV/AIDS interventions.

University students face unique vulnerabilities that can influence their engagement with health services. For example, students with low health literacy tend to engage in riskier sexual behaviors and are less likely to use preventive measures (Shimie et al., 2022). Emotional distress further complicates this issue, as it may reduce students' ability to recognize symptoms or seek care (Sarhan et al., 2020). On the other hand, the academic environment also presents opportunities. The widespread use of the internet, combined with institutional support and peer engagement, can significantly strengthen students' health literacy and behavioral outcomes (Gedefaw et al., 2020; Teixeira et al., 2022; Almanasef, 2021).

The findings of this study support the implementation of targeted health promotion policies within university settings. Health services on campuses should integrate health literacy initiatives that foster self-confidence and informed decision-making among students. Evidence from recent studies suggests that such approaches can be especially impactful in the post-pandemic era, where mental health and social well-being are critical priorities (Saputra et al., 2023; Akakpo & Neuerer, 2024). Furthermore, initiatives that encourage peer support and reproductive health awareness can serve as a foundation for sustainable health practices beyond academic life (Zahara et al., 2024; Doe et al., 2022; Ungvári et al., 2023).

This study offers several strengths. First, it addresses a critical gap in the Indonesian context by focusing specifically on university students in Yogyakarta, an area with a diverse and dynamic student population. The use of consecutive sampling and the digital questionnaire method allowed for efficient data collection from various institutions, capturing a relatively broad spectrum of respondents. Second, the findings contribute empirically to the growing body of literature supporting the role of health literacy in HIV/AIDS prevention, reinforcing previous conclusions while offering a region-specific perspective that

can guide localized policy formulation.

However, there are also notable limitations. The use of a cross-sectional design prevents the establishment of causal relationships between variables, and the reliance on self-reported data may introduce response bias, particularly in a culturally sensitive topic such as sexual behavior. Additionally, the use of online questionnaires might have excluded participants with limited internet access or low digital literacy. Future research is recommended to utilize longitudinal approaches and include qualitative components to explore underlying mechanisms and contextual factors affecting student health literacy and behavior.

CONCLUSION

This study confirms a significant relationship between health literacy levels and HIV/AIDS prevention behavior among university students in Yogyakarta. Students with higher health literacy demonstrated markedly better preventive behaviors, including consistent condom use and proactive health-seeking attitudes. These findings underscore the critical role of health literacy as a determinant of individual decision-making and risk reduction in the context of HIV/AIDS.

From a public health perspective, this study contributes valuable evidence highlighting the need to prioritize health literacy as a strategic component in HIV/AIDS prevention efforts, particularly among young adults in academic settings. Strengthening students' capacity to access, comprehend, and apply health information can serve as a powerful tool to curb the spread of HIV and promote sustainable health practices.

Given these findings, it is recommended that universities and public health authorities integrate structured health literacy education into academic programs and extracurricular platforms. Health workers and campus-based healthcare providers should actively engage in disseminating accessible, culturally relevant information tailored to student needs. For policymakers, expanding digital and community-based literacy initiatives may help close existing gaps in health awareness. Future researchers are encouraged to explore longitudinal and qualitative approaches to deepen understanding of the mechanisms linking health literacy and behavioral outcomes, as well as to evaluate the effectiveness of targeted interventions across different student populations.

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AUTHORS' CONTRIBUTIONS

Este Latifahanun designed the study, formulated the concept, wrote the manuscript, collected data, and analyzed the data. Safirina Aulia Rahmi reviewed the manuscript, enrolled participants. Sarif Febriandi reviewed the manuscript. Mahardika Ratih Resti Andani collected data and analyzed the data. Riadinata Shinta P. wrote the manuscript, and revised the manuscript. All Authors performed the field work and approved the final

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COMPETING INTERESTS

The authors affirm that there are no conflicts of interest related to the research, writing, or publication of this article.

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