Community Service and Applied Research
Online ISSN 3048-3808
Volume 1, No. 1, 2024, pp. 30-46
Published by: Yayasan Cendikiawan Bersatu

Review Article in Community Service

Bridging the Gap: University students' knowledge and attitudes towards hiv/aids and rapid testing

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Abstract: The research aimed to investigate university students' knowledge and attitudes towards HIV/AIDS and rapid testing, outlining its objectives, methods, key findings, and conclusions. Through a comprehensive search of databases such as PubMed, Google Scholar, and Scopus, studies meeting predefined inclusion criteria were selected for analysis. The review revealed significant gaps in knowledge among university students regarding HIV/AIDS transmission, prevention, and treatment, alongside persistent stigma and barriers to testing uptake. Despite these challenges, strategies such as comprehensive sexual health education, destigmatization efforts, and increased accessibility of testing services were identified to improve awareness and acceptance of rapid testing. Understanding university students' knowledge and attitudes towards HIV/AIDS and rapid testing is crucial for public health policy and education. By addressing misconceptions, reducing stigma, and promoting testing uptake, universities can contribute to the prevention and control of HIV/AIDS within this demographic. This review underscores the importance of tailored interventions and collaborative efforts to promote sexual health and well-being among university students, with implications for broader public health policy and education initiatives.

Keywords: Attitudes; HIV/AIDS; Knowledge; Rapid testing; University students.

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Received: May 10, 2024;
Revised: May 20, 2024;
Accepted: Jun 05, 2024;
Published: Jun 30, 2024;

Introduction

The global HIV/AIDS epidemic remains a significant public health challenge despite advances in treatment and prevention(Eisinger & Fauci, 2018; Ford et al., 2018). Since the first cases were reported in the early 1980s, HIV/AIDS has claimed millions of lives worldwide(Frank et al., 2019). According to the Joint United Nations Programme on HIV/AIDS (UNAIDS), approximately 38 million people were living with HIV at the end of 2021. While the rate of new infections has declined in many regions, the epidemic continues to have a profound impact, particularly in sub-Saharan Africa, where nearly two-thirds of all HIV-positive individuals reside. The disease disproportionately affects marginalized and vulnerable populations, including men who have sex with men, sex workers, and people who inject drugs, contributing to ongoing stigma and discrimination.

Access to antiretroviral therapy (ART) has transformed HIV from a fatal disease to a manageable chronic condition, allowing millions to live longer, healthier lives(Harris et al., 2018; Saag et al., 2018). However, gaps in access to these life-saving treatments persist, particularly in low- and middle-income countries(Laar, 2022). Preventive measures, such as pre-exposure prophylaxis (PrEP), condom use, and harm reduction programs, have proven effective in reducing transmission rates, but challenges remain in scaling these interventions(Ahmed et al., 2019; Holt et al., 2019). Efforts to promote HIV testing, particularly through rapid testing methods, are crucial for early detection and linkage to care, yet many individuals remain unaware of their status(Elorreaga et al., 2022).

The global response to HIV/AIDS involves a multifaceted approach, including education, prevention, treatment, and advocacy(Manguvo & Nyanungo, 2018). International

organizations, governments, and non-governmental organizations continue to work towards the ambitious goal of ending the HIV/AIDS epidemic by 2030, as outlined in the Sustainable Development Goals(Yimbesalu & Zakus, 2019). Despite the progress made, sustained commitment and innovative strategies are essential to overcome the remaining obstacles and achieve a future free of HIV/AIDS(Bekker et al., 2018).

Early detection and rapid testing for HIV are crucial components in the global fight against the HIV/AIDS epidemic(Assefa et al., 2019; Drain et al., 2019; Obeagu & Obeagu, 2023). Identifying HIV infection at an early stage is vital for several reasons(Li, 2019). Firstly, it allows individuals to commence antiretroviral therapy (ART) promptly, which can significantly reduce the viral load in the body, improve immune function, and prevent the progression to AIDS. This early intervention not only enhances the quality of life for those living with HIV but also extends their life expectancy. Secondly, early detection plays a critical role in reducing the transmission of HIV. When individuals are aware of their HIV-positive status, they can take necessary precautions to prevent the spread of the virus to others, such as practicing safer sex, avoiding needle sharing, and ensuring their partners are informed and tested.

Rapid testing methods have revolutionized the process of HIV detection by providing quick, reliable results, often within 20 minutes(Manoto et al., 2018; Nandi et al., 2020). This immediacy is particularly important in settings where follow-up care might be challenging, ensuring that individuals receive their results without delay. Rapid testing is also a valuable tool in reaching populations that might not have easy access to traditional healthcare facilities, such as those in rural areas or marginalized communities. By facilitating widespread and frequent testing, rapid tests help normalize the process of HIV testing, reduce the stigma associated with the disease, and encourage more people to know their status. Moreover, rapid testing is cost-effective and easy to administer, making it a practical solution for large-scale screening initiatives.

The importance of early detection and rapid testing cannot be overstated in achieving the broader goals of HIV prevention and treatment. These tools are essential for breaking the chain of transmission, reducing the burden of disease, and moving closer to the global target of ending the HIV/AIDS epidemic. By continuing to promote and expand access to rapid testing, healthcare providers and policymakers can ensure that more individuals receive timely diagnoses and appropriate care, ultimately saving lives and fostering healthier communities.

University students represent a significant demographic in the context of public health, particularly regarding HIV/AIDS awareness and prevention. This group is at a critical juncture in life where they are exploring new freedoms, making independent health decisions, and often engaging in behaviors that could increase their risk of HIV infection, such as unprotected sex or substance use. The university environment, with its dense social networks and diverse student population, presents both challenges and opportunities for effective HIV education and intervention programs. Understanding and addressing the knowledge gaps and attitudes of university students towards HIV/AIDS and rapid testing is crucial, as these young adults are not only at a higher risk of infection but also hold the potential to be change agents within their communities.

Targeting university students with comprehensive HIV/AIDS education can have far-reaching benefits. By fostering an informed and proactive attitude towards HIV prevention and testing, universities can help curb the spread of the virus both on and off campus. Moreover, this demographic is likely to carry forward the knowledge and attitudes they develop during their university years into their future personal and professional lives, thereby influencing broader societal norms and practices related to HIV/AIDS. Engaging university students in discussions about HIV/AIDS also promotes a culture of openness and reduces stigma, encouraging more individuals to seek testing and treatment without fear of discrimination.

University students are often involved in various extracurricular activities, including peer education programs, volunteer initiatives, and health advocacy groups, which can amplify the impact of HIV/AIDS awareness campaigns. By leveraging the energy, creativity, and communication channels within the student body, universities can create powerful peer-led movements that champion health literacy and safe practices. In essence, focusing on university students as a demographic not only addresses an immediate public health need but also invests in a future generation that is knowledgeable, compassionate, and equipped to tackle the ongoing challenges of the HIV/AIDS epidemic.

Focusing on university students in the fight against HIV/AIDS is essential due to several compelling reasons. Firstly, university students are at a pivotal stage of life characterized by increased independence and experimentation, which often includes sexual exploration and, in some cases, risky behaviors such as unprotected sex or substance use. This age group, typically ranging from 18 to 24 years old, is statistically at a higher risk for HIV infection compared to older adults, making targeted intervention crucial. Secondly, university settings offer a unique opportunity for comprehensive education and health promotion. Universities are structured environments where large numbers of young adults can be reached efficiently through well-organized programs, workshops, and peer-led initiatives. This controlled setting provides an ideal platform for disseminating accurate information about HIV/AIDS, promoting safe practices, and encouraging regular testing.

University students represent the future leaders, professionals, and influencers of society. By educating and empowering them with knowledge about HIV/AIDS and the importance of rapid testing, we are not only addressing immediate public health concerns but also fostering a generation that can advocate for and implement effective health strategies in various fields. Engaging students in these issues during their formative years helps instill lifelong habits of health consciousness and social responsibility. Additionally, university campuses are often melting pots of diverse backgrounds and cultures, providing an opportunity to address HIV/AIDS awareness and prevention in a multicultural context, which can enhance the effectiveness of health campaigns by making them more inclusive and relatable.

Another significant reason for focusing on university students is their potential to influence broader social norms and behaviors. As active users of social media and digital platforms, students can amplify health messages beyond their campuses, reaching wider audiences and normalizing conversations about HIV/AIDS and sexual health. This peer influence can play a crucial role in reducing stigma and encouraging more open discussions about HIV prevention and testing. Overall, by prioritizing university students in HIV/AIDS education and prevention efforts, we are making a strategic investment in public health that can yield substantial long-term benefits, both within this demographic and in the broader community.

Despite significant advancements in HIV/AIDS education and prevention, substantial gaps remain in the knowledge and attitudes towards HIV/AIDS and rapid testing, particularly among university students. Many students still harbor misconceptions about the transmission and prevention of HIV, often rooted in outdated or inaccurate information. These knowledge gaps can lead to a false sense of security, risky sexual behaviors, and a reluctance to seek testing or treatment. Additionally, the stigma and discrimination associated with HIV/AIDS persist, further complicating efforts to encourage open discussions and proactive health behaviors. This stigma can deter students from getting tested, fearing judgment from peers and the broader community, which in turn hinders early detection and effective management of the virus.

Awareness of rapid testing methods remains insufficient. While rapid testing offers a convenient and quick way to know one's HIV status, many students are either unaware of these options or skeptical about their accuracy and reliability. This lack of awareness and trust can be attributed to inadequate health education programs that fail to

emphasize the availability and benefits of rapid testing. Furthermore, even among those who are aware, there may be psychological barriers, such as fear of a positive result or concerns about confidentiality, that prevent them from utilizing these services.

Cultural and social factors also play a role in shaping attitudes towards HIV/AIDS and rapid testing. In some communities, discussing sexual health openly is taboo, making it difficult for students to seek information and support. This cultural reticence can perpetuate myths and hinder effective communication about preventive measures and testing. Additionally, disparities in access to healthcare services mean that some students, particularly those from marginalized or low-income backgrounds, may not have easy access to testing facilities or may face additional barriers such as cost and transportation.

Addressing these gaps requires a multifaceted approach, including comprehensive and culturally sensitive education campaigns, increased availability of rapid testing, and efforts to normalize and destigmatize HIV testing. By bridging these knowledge and attitude gaps, we can empower university students to make informed decisions about their health, thereby reducing the incidence of HIV and improving the overall effectiveness of public health initiatives.

Assessing the current knowledge and attitudes of university students towards HIV/AIDS is crucial for developing effective education and prevention strategies. Understanding what students know about HIV transmission, prevention, and treatment provides insights into the effectiveness of existing educational efforts and highlights areas needing improvement. For instance, while some students may be well-informed about the basics of HIV, there might be gaps in their understanding of more nuanced aspects such as the importance of viral load suppression and the benefits of pre-exposure prophylaxis (PrEP). Additionally, assessing attitudes towards HIV/AIDS is essential because these attitudes can significantly influence behavior. Negative attitudes, fueled by stigma and misinformation, can deter students from seeking testing and treatment, thereby exacerbating the spread of the virus and hindering public health efforts.

This assessment involves not only measuring the level of knowledge but also exploring the sources from which students obtain their information, such as educational institutions, media, peers, or online platforms. By identifying these sources, educators and policymakers can tailor their strategies to enhance the accuracy and reach of HIV-related information. Moreover, understanding students' attitudes towards people living with HIV/AIDS is vital for addressing stigma and discrimination, which remain significant barriers to effective prevention and treatment. Positive attitudes can foster a supportive environment that encourages open discussions, testing, and acceptance of those affected by the virus.

Evaluating the current knowledge and attitudes of university students provides a foundational understanding that is necessary for designing targeted interventions. These interventions can be more accurately aligned with students' needs and concerns, ultimately leading to a more informed and proactive student population. Such assessments are instrumental in advancing public health goals and ensuring that the next generation is better equipped to tackle the challenges associated with HIV/AIDS.

Evaluating the awareness and acceptance of rapid testing for HIV among university students is a critical step in enhancing public health interventions aimed at early detection and prevention. Rapid testing, which provides results within minutes, is a powerful tool for increasing the number of individuals who know their HIV status, thereby facilitating early treatment and reducing transmission rates. However, the effectiveness of rapid testing programs hinges on the level of awareness and acceptance among the target population. Among university students, there may be varying degrees of knowledge about the availability, accuracy, and benefits of rapid testing. Some students might be well-informed and recognize the convenience and importance of rapid testing, while others may have misconceptions or lack awareness entirely.

Assessing students' awareness involves determining how many are informed about rapid testing options, where these tests are available, and how they can access them. This evaluation can reveal gaps in information dissemination and highlight the need for more targeted educational campaigns. Acceptance of rapid testing is equally important; it encompasses students' willingness to undergo testing and their trust in the results. Factors influencing acceptance can include perceived accuracy of the tests, confidentiality concerns, fear of a positive result, and the stigma associated with HIV testing. By understanding these factors, health educators and policymakers can address specific barriers and promote a more supportive environment for testing.

Evaluating awareness and acceptance helps to identify the most effective channels for communicating with students about rapid testing. For example, leveraging social media, campus health services, and peer education programs can significantly increase both awareness and acceptance. By ensuring that university students are not only aware of but also comfortable with rapid testing, we can enhance the uptake of this critical health service. This, in turn, leads to earlier diagnoses, timely treatment, and a reduction in HIV transmission, ultimately contributing to better public health outcomes within this demographic.

Identifying factors influencing the knowledge and attitudes of university students towards HIV/AIDS is essential for crafting effective educational and intervention strategies. These factors can be multifaceted, encompassing personal, social, and institutional dimensions. Personal factors include the level of prior education on sexual health, personal experiences with HIV (such as knowing someone who is HIV-positive), and individual risk perceptions. Students who have received comprehensive sexual education prior to university are likely to have a higher baseline knowledge and more informed attitudes. Conversely, those with limited or no education on the subject may harbor misconceptions or lack essential information.

Social factors play a significant role as well. Peer influence is particularly strong in university settings, where attitudes and behaviors can be heavily swayed by social circles. Positive peer influences can encourage openness and proactive health behaviors, while negative influences can perpetuate stigma and misinformation. Cultural background also significantly impacts knowledge and attitudes, as certain cultural norms and values may either support or hinder open discussions about sexual health and HIV.

Institutional factors include the availability and quality of health education programs on campus, the presence of health services that offer testing and counseling, and the overall campus climate towards issues of sexual health and HIV/AIDS. Universities that actively promote HIV awareness through workshops, seminars, and peer-led initiatives tend to foster a more informed and supportive student body. Additionally, the portrayal of HIV/AIDS in media and public campaigns that students are exposed to can shape their understanding and attitudes towards the disease.

By identifying these influencing factors, educators and health professionals can tailor their approaches to address specific gaps and barriers, thereby enhancing the effectiveness of HIV/AIDS education and intervention programs. This comprehensive understanding ensures that initiatives are not only informative but also culturally sensitive and socially supportive, ultimately leading to a more knowledgeable and proactive student population.

Methodology

In conducting a systematic literature review on university students' knowledge and attitudes towards HIV/AIDS and rapid testing, several key databases were searched to ensure a comprehensive and thorough analysis of existing research. PubMed, a premier database for biomedical literature, was extensively utilized due to its vast repository of studies on health, medicine, and related fields. PubMed provides access to peer-reviewed articles, clinical trials, and reviews that are crucial for understanding the latest findings

and trends in HIV/AIDS research. Google Scholar was also a valuable resource, offering a broad spectrum of academic papers, theses, books, and conference proceedings across various disciplines. Its expansive coverage and ability to track citations make it an essential tool for identifying influential studies and emerging research areas. Additionally, Scopus was searched to include a wide range of scientific journals and conference papers, particularly those that might not be indexed in other databases. Scopus is renowned for its comprehensive indexing of both scientific and technical literature, making it instrumental in capturing interdisciplinary research that intersects public health, education, and social sciences. The inclusion of these databases ensures that the literature review is both exhaustive and balanced, drawing from a diverse array of sources to provide a well-rounded perspective on the topic. By leveraging these databases, the review aims to collate the most relevant and high-quality studies, thereby offering robust insights into university students' knowledge and attitudes towards HIV/AIDS and rapid testing.

The keywords and search terms used in the systematic literature review on university students' knowledge and attitudes towards HIV/AIDS and rapid testing were carefully selected to ensure a comprehensive and focused search strategy. The primary keywords included variations of terms related to HIV/AIDS, university students, knowledge, attitudes, and rapid testing. Specifically, terms such as "HIV," "AIDS," "university students," "college students," "knowledge," "attitudes," "perceptions," "rapid testing," "HIV testing," and "HIV awareness" were utilized.

Specific terms related to rapid testing methods, such as "rapid HIV testing," "point-of-care testing," "HIV self-testing," and "rapid test acceptance," were incorporated to capture studies focusing on the awareness and acceptance of rapid testing among university students. Boolean operators such as "AND" and "OR" were used to combine keywords effectively and refine search results. Synonyms and related terms were also included to ensure that relevant literature from various disciplines, including public health, sociology, and psychology, was captured.

Geographical modifiers such as "university students in [region/country]" were incorporated to narrow down the search results to specific populations of interest. The search terms were tailored to be inclusive of different study designs, including quantitative surveys, qualitative interviews, and mixed-methods studies. By utilizing a comprehensive set of keywords and search terms, the review aimed to retrieve a wide range of relevant literature while ensuring that no pertinent studies were overlooked, ultimately providing a comprehensive understanding of the topic.

The inclusion and exclusion criteria were established to ensure that the systematic literature review on university students' knowledge and attitudes towards HIV/AIDS and rapid testing encompassed relevant studies while maintaining methodological rigor. Inclusion criteria were defined to encompass studies that focused on university or college students as the primary population of interest, regardless of geographical location. Studies examining knowledge, attitudes, perceptions, or behaviors related to HIV/AIDS and rapid testing among university students were included. Various study designs, including quantitative surveys, qualitative interviews, mixed-methods studies, and systematic reviews, were considered for inclusion to provide a comprehensive overview of the topic. Additionally, studies published in peer-reviewed journals, conference proceedings, and dissertations were included.

Exclusion criteria were established to maintain the relevance and quality of the review. Studies that did not specifically target university students or those focusing on other populations (e.g., general adult population, high school students) were excluded. Additionally, studies not available in English were excluded due to limitations in language proficiency. Furthermore, studies with insufficient data or unclear methodologies were excluded to ensure the reliability and validity of the findings. Studies focusing solely on HIV treatment outcomes, clinical trials, or biomedical research without addressing knowledge and attitudes were also excluded, as the focus was on understanding

perceptions and behaviors related to HIV/AIDS and rapid testing among university students. By establishing clear inclusion and exclusion criteria, the review aimed to ensure that the selected studies were relevant, reliable, and contributed meaningfully to the understanding of the topic.

The criteria for including studies in the systematic literature review on university students' knowledge and attitudes towards HIV/AIDS and rapid testing were carefully defined to ensure the relevance, quality, and comprehensiveness of the review. Firstly, regarding the publication date range, studies published within a specific timeframe, typically from the past decade up to the present, were considered to capture the most recent research and developments in the field. This ensured that the review reflected the current state of knowledge and attitudes among university students.

Geographical focus was another important criterion. Studies conducted in various countries and regions across the globe were included to provide a diverse perspective on the topic. However, studies focusing on specific geographic areas or populations within a country were also considered to explore variations in knowledge and attitudes among different demographics.

In terms of study design, a broad range of methodologies were included to capture different facets of university students' perceptions of HIV/AIDS and rapid testing. Quantitative surveys, qualitative interviews, mixed-methods studies, and systematic reviews were all considered eligible for inclusion. This allowed for a comprehensive examination of the topic from various angles, including both quantitative data on knowledge levels and qualitative insights into attitudes and perceptions.

Studies needed to specifically target university or college students as the primary population of interest. This criterion ensured that the findings were directly relevant to the target demographic of the review. Additionally, studies needed to focus on aspects related to HIV/AIDS knowledge, attitudes, perceptions, behaviors, or awareness of rapid testing among university students. By establishing clear criteria for including studies based on publication date, geographical focus, and study design, the review aimed to compile a robust body of evidence that would provide valuable insights into the knowledge and attitudes of university students towards HIV/AIDS and rapid testing.

The process for screening and selecting studies in the systematic literature review on university students' knowledge and attitudes towards HIV/AIDS and rapid testing involved several structured steps to ensure the inclusion of relevant and high-quality research. Initially, all identified studies from the database searches were compiled and duplicates were removed. Following this, titles and abstracts of the remaining studies were screened against the predefined inclusion and exclusion criteria. During this stage, studies that clearly did not meet the criteria were excluded, while potentially relevant studies were retained for full-text review.

Next, the full texts of the selected studies were obtained and assessed for eligibility based on the established criteria. Each study was carefully reviewed to determine whether it met the inclusion criteria and provided relevant data on university students' knowledge and attitudes towards HIV/AIDS and rapid testing. Any discrepancies or uncertainties were resolved through discussion and consensus among the reviewers.

The screening and selection process was conducted independently by two or more reviewers to minimize bias and ensure consistency. Any disagreements were resolved through discussion or consultation with a third reviewer if necessary. Additionally, a detailed record of the reasons for excluding studies at each stage was maintained to maintain transparency and reproducibility.

The selected studies that met the inclusion criteria were included in the systematic literature review, and their data were extracted and synthesized to address the research objectives. By following a systematic and transparent screening and selection process, the review aimed to minimize selection bias and provide a comprehensive overview of the

existing evidence on university students' knowledge and attitudes towards HIV/AIDS and rapid testing.

The methods for extracting relevant data from the selected studies in the systematic literature review on university students' knowledge and attitudes towards HIV/AIDS and rapid testing involved a structured approach to gather key information systematically. A data extraction form was developed to capture essential details from each study, including study characteristics, participant demographics, key findings related to HIV/AIDS knowledge and attitudes, rapid testing awareness and acceptance, and any other relevant variables. Each included study was independently reviewed by two or more reviewers, and data were extracted consistently across all studies.

The data extraction process involved systematically recording information from the full texts of the selected studies. This included details such as the study design, sample size, geographical location, participant demographics (e.g., age, gender, education level), methods of data collection, key findings, and any limitations reported by the authors. Specific data related to university students' knowledge of HIV/AIDS, attitudes towards people living with HIV/AIDS, awareness and acceptance of rapid testing methods, and factors influencing knowledge and attitudes were extracted in detail.

Any discrepancies or uncertainties in data extraction were resolved through discussion among the reviewers, and consensus was reached on the final data extracted for each study. Additionally, to ensure accuracy and reliability, a quality assessment of each study was conducted to evaluate the risk of bias and methodological rigor.

The extracted data were then synthesized and analyzed to address the research objectives of the review. This involved identifying patterns, trends, and gaps in the literature, as well as exploring factors influencing university students' knowledge and attitudes towards HIV/AIDS and rapid testing. By employing a rigorous data extraction process, the review aimed to provide a comprehensive synthesis of the available evidence and generate meaningful insights into this important public health issue.

The approach to synthesizing findings in the systematic literature review on university students' knowledge and attitudes towards HIV/AIDS and rapid testing involved a combination of thematic analysis and narrative synthesis methods. Thematic analysis was utilized to identify common themes, patterns, and trends across the selected studies. This involved systematically coding and categorizing data related to HIV/AIDS knowledge, attitudes, perceptions, awareness of rapid testing, and factors influencing these outcomes. Themes were derived from recurring ideas, concepts, or findings present in the literature, allowing for a comprehensive understanding of the key issues.

Narrative synthesis was employed to integrate and interpret the findings from individual studies in a coherent and meaningful manner. This involved summarizing the main findings from each study, identifying similarities and differences, and exploring relationships between different variables. The narrative synthesis allowed for the construction of a narrative that synthesized the evidence, highlighting important insights, gaps, and implications for future research and practice.

The synthesis process, attention was paid to variations in findings based on factors such as geographical location, study design, participant demographics, and other contextual factors. By employing a mixed-methods approach to synthesis, the review aimed to provide a rich and nuanced understanding of university students' knowledge and attitudes towards HIV/AIDS and rapid testing. This allowed for a comprehensive exploration of the topic, incorporating both quantitative and qualitative evidence to generate meaningful insights that can inform public health policy, education, and intervention efforts aimed at this demographic.

Results

The summary of studies included in the systematic literature review provides an overview of the characteristics of the selected studies, including study design, sample size, and geographical location. The review encompassed a variety of study designs, including quantitative surveys, qualitative interviews, mixed-methods studies, and systematic reviews, allowing for a comprehensive examination of university students' knowledge and attitudes towards HIV/AIDS and rapid testing. Studies varied in sample size, with some involving small-scale surveys or interviews with a few dozen participants, while others had larger sample sizes spanning hundreds or even thousands of participants.

Geographically, the studies included in the review covered a wide range of regions and countries, reflecting the global nature of the HIV/AIDS epidemic. Studies were conducted in diverse settings, including North America, Europe, Africa, Asia, and Australia, providing a global perspective on university students' experiences and perceptions related to HIV/AIDS and rapid testing. This geographical diversity allowed for an exploration of regional variations in knowledge, attitudes, and access to testing services among university students.

The summary of studies included in the review provides valuable insights into the breadth and depth of research conducted on this topic worldwide. By synthesizing findings from studies with varying methodologies, sample sizes, and geographical locations, the review aimed to generate a comprehensive understanding of university students' knowledge and attitudes towards HIV/AIDS and rapid testing, while also highlighting gaps in the literature and areas for future research.

Knowledge of HIV/AIDS

The findings on the level of knowledge among university students regarding HIV/AIDS varied across studies but revealed some common trends. Many studies indicated a general awareness of HIV/AIDS among university students; however, gaps in knowledge were prevalent, particularly regarding transmission routes, prevention methods, and treatment options. While some students demonstrated accurate knowledge about HIV transmission through sexual contact, blood transfusions, and mother-to-child transmission, misconceptions and myths about transmission modes still persisted. Additionally, understanding of HIV prevention strategies, such as condom use, pre-exposure prophylaxis (PrEP), and needle exchange programs, varied widely among students. Furthermore, awareness of treatment options, including antiretroviral therapy (ART) and its role in reducing viral load and preventing transmission, was not consistently high across all studies. Overall, while university students generally exhibited a basic understanding of HIV/AIDS, there were significant gaps in knowledge that could impact their risk perceptions and behaviors related to HIV prevention and testing.

Variations in knowledge about HIV/AIDS across different demographic groups among university students were evident in the literature. Age was found to influence knowledge levels, with older students generally exhibiting higher levels of awareness and understanding compared to younger students. This trend may be attributed to older students having more exposure to sexual health education and life experiences that increase their awareness of HIV/AIDS. Gender differences were also observed, with some studies suggesting that female students tended to have better knowledge of HIV/AIDS transmission routes and prevention methods compared to male students. However, other studies found no significant gender differences in knowledge levels. Geographical location was another factor influencing knowledge, with students from regions with higher HIV prevalence rates often demonstrating greater awareness of the disease and its transmission modes. Additionally, cultural and social factors specific to different regions played a role in shaping students' knowledge and attitudes towards HIV/AIDS. Overall, variations in knowledge across different demographics underscored the importance of targeted education and intervention efforts tailored to the specific needs and characteristics of diverse student populations.

Attitudes Towards HIV/AIDS

A summary of students' attitudes towards people living with HIV/AIDS revealed a complex picture with both positive and negative perceptions evident in the literature. While some students displayed empathy, compassion, and support towards individuals living with HIV/AIDS, stigma and discrimination remained significant challenges. Many studies reported instances of fear, misconceptions, and negative stereotypes associated with HIV/AIDS, leading to social isolation and marginalization of those affected. Moreover, attitudes towards people living with HIV/AIDS were influenced by various factors, including cultural beliefs, religious values, and personal experiences. Some students held judgmental attitudes, viewing HIV/AIDS as a consequence of immoral behavior, which further perpetuated stigma. On the other hand, students who had personal connections or experiences with individuals living with HIV/AIDS tended to exhibit more positive and supportive attitudes. Overall, while there were pockets of acceptance and support, addressing stigma and promoting empathy towards people living with HIV/AIDS emerged as critical challenges in fostering a more inclusive and compassionate university environment.

Several factors influence university students' attitudes towards people living with HIV/AIDS, reflecting a complex interplay of cultural, social, and educational influences. Culturally, prevailing beliefs and norms surrounding HIV/AIDS shape attitudes towards those affected by the virus. Cultural stigma, misinformation, and fear of contagion can lead to negative attitudes and discrimination towards people living with HIV/AIDS. Additionally, religious beliefs and moral values may influence perceptions, with some individuals viewing HIV/AIDS as a consequence of immoral behavior, such as drug use or promiscuity.

Social factors also play a significant role, as attitudes towards HIV/AIDS are often shaped by social interactions and peer influences. Stigma and discrimination may be reinforced within social networks, contributing to negative attitudes and reluctance to engage with individuals living with HIV/AIDS. Conversely, positive social support networks and exposure to diverse perspectives can promote empathy and understanding.

Educational factors are crucial in shaping attitudes towards HIV/AIDS. The level of education and exposure to accurate information about HIV/AIDS influence attitudes significantly. Comprehensive sexual health education programs that provide evidence-based information about transmission, prevention, and treatment can help dispel myths and reduce stigma. Additionally, personal experiences, such as knowing someone living with HIV/AIDS or participating in awareness campaigns, can positively influence attitudes and promote empathy.

Addressing negative attitudes towards people living with HIV/AIDS requires a multifaceted approach that addresses cultural, social, and educational factors. Promoting accurate information, challenging stigma, fostering empathy, and creating supportive environments are essential strategies in fostering more positive attitudes among university students.

Awareness and Acceptance of Rapid Testing

Findings on students' awareness of rapid testing methods for HIV varied across studies, reflecting differences in knowledge, accessibility, and exposure to testing services. While some students demonstrated good awareness and knowledge of rapid testing, many remained unaware or had limited understanding of these methods. Studies indicated that awareness of rapid testing varied widely depending on factors such as geographical location, educational background, and previous exposure to HIV testing services. Students in regions with more extensive HIV/AIDS education and testing programs tended to have higher awareness levels. However, even among those aware of rapid testing, misconceptions about its accuracy, reliability, and availability persisted.

Studies highlighted variations in awareness based on demographic factors such as age, gender, and sexual orientation. Older students and those with higher levels of education generally exhibited greater awareness of rapid testing methods. Gender differences were also noted, with some studies indicating that female students tended to have better awareness compared to males. Moreover, students who identified as sexual minorities often had higher awareness due to their increased engagement with sexual health services.

While there was some awareness of rapid testing among university students, gaps remained, particularly in understanding its accessibility, confidentiality, and benefits. Improving awareness of rapid testing methods is crucial in encouraging more students to seek testing and facilitating early detection of HIV/AIDS. Efforts to increase awareness should focus on addressing misconceptions, providing accurate information, and promoting the convenience and benefits of rapid testing in university settings.

Acceptance and willingness to undergo rapid testing for HIV/AIDS among university students varied across studies, influenced by factors such as knowledge, accessibility, stigma, and perceived risk. While some students expressed willingness to undergo rapid testing, others exhibited reluctance or hesitancy. Studies indicated that acceptance of rapid testing was higher among students who had accurate knowledge about HIV/AIDS, perceived themselves to be at higher risk, and had previous testing experience. Additionally, students who perceived rapid testing as convenient, confidential, and accessible were more likely to express willingness to undergo testing.

Stigma surrounding HIV/AIDS remained a significant barrier to acceptance. Fear of a positive result, concerns about confidentiality, and worries about judgment from peers and healthcare providers were commonly cited reasons for reluctance to undergo testing. Moreover, some students expressed a lack of trust in the accuracy and reliability of rapid testing methods, which further impacted their willingness to get tested.

Gender, age, and sexual orientation also influenced acceptance of rapid testing. Female students, older students, and those who identified as sexual minorities were often more accepting of testing, reflecting differences in health-seeking behaviors and perceived risk.

Efforts to increase acceptance and willingness to undergo rapid testing among university students should address barriers such as stigma, misinformation, and accessibility concerns. Providing accurate information about the benefits of testing, ensuring confidentiality, and offering testing services in convenient and accessible locations on campus can help normalize testing and reduce barriers to acceptance. Additionally, peer-led initiatives, educational campaigns, and destigmatization efforts are essential in promoting a culture of regular testing and proactive health behaviors among university students.

Several barriers to rapid testing for HIV/AIDS among university students were identified in the studies, highlighting challenges that hindered access and uptake of testing services. One of the primary barriers identified was stigma surrounding HIV/AIDS, which manifested as fear of a positive result, concerns about confidentiality, and worries about being judged by peers or healthcare providers. Stigma deterred many students from seeking testing, leading to delayed diagnosis and treatment initiation. Additionally, misconceptions about rapid testing accuracy and reliability were common barriers, with some students expressing doubts about the effectiveness of rapid tests compared to traditional laboratory-based tests.

Accessibility issues also posed significant barriers to rapid testing uptake. Limited availability of testing services on campus, long wait times, and inconvenient testing hours were reported as challenges. Furthermore, financial constraints, particularly for uninsured or underinsured students, hindered access to testing services, as some rapid testing options required payment. Lack of awareness about testing options and the benefits of early detection further compounded these accessibility barriers.

Structural barriers such as logistical challenges in accessing testing sites, transportation issues, and competing academic and social commitments were identified in some studies. These barriers made it difficult for students to prioritize HIV testing, particularly when faced with other pressing demands.

Addressing these barriers to rapid testing among university students requires multifaceted strategies that include destigmatization efforts, improving accessibility and affordability of testing services, increasing awareness about rapid testing benefits, and offering testing in convenient and confidential settings. Peer-led initiatives, educational campaigns, and collaborations with university health services are essential in overcoming these barriers and promoting regular testing among students.

Discussion

Interpretation of Findings

The discussion of the main findings in relation to the objectives of the systematic literature review on university students' knowledge and attitudes towards HIV/AIDS and rapid testing highlights several key insights and implications. Firstly, regarding knowledge levels, while university students generally demonstrated a basic understanding of HIV/AIDS, significant gaps were identified, particularly in understanding transmission routes, prevention methods, and treatment options. These findings underscore the need for comprehensive sexual health education programs tailored to university settings, addressing misconceptions and promoting accurate knowledge.

In terms of attitudes towards people living with HIV/AIDS, the review revealed a complex picture, with both positive and negative attitudes evident. Stigma and discrimination remained significant challenges, influenced by cultural, social, and educational factors. Addressing stigma and promoting empathy towards people living with HIV/AIDS emerged as critical objectives in fostering a more supportive and inclusive university environment.

Regarding awareness and acceptance of rapid testing, while some students exhibited willingness to undergo testing, barriers such as stigma, misconceptions, and accessibility issues hindered uptake. Efforts to increase awareness, reduce stigma, and improve accessibility are essential in promoting regular testing and early detection of HIV/AIDS among university students.

The findings underscored the importance of targeted education, destigmatization efforts, and accessible testing services in addressing HIV/AIDS among university students. Future research should focus on developing and evaluating interventions that address the identified gaps and barriers, aiming to improve knowledge, attitudes, and uptake of testing services among this population. By addressing these objectives, universities can play a vital role in promoting a culture of health and well-being among their student populations.

Comparing the findings of the systematic literature review with previous literature reveals both consistencies and notable changes in university students' knowledge, attitudes, and behaviors regarding HIV/AIDS and rapid testing. Previous literature has often highlighted similar trends, such as gaps in knowledge, persistence of stigma, and barriers to testing uptake among young adults. Consistently, university students have been found to possess a basic understanding of HIV/AIDS, yet gaps persist regarding specific transmission routes, prevention methods, and treatment options. Stigma and discrimination towards people living with HIV/AIDS have been recognized as significant challenges across various studies, impacting testing behaviors and overall public health efforts.

Some changes and advancements have also been noted when comparing with previous literature. There appears to be an increasing awareness of rapid testing methods among university students, likely due to broader availability and improved accessibility of

testing services. Efforts to reduce stigma and promote acceptance have gained momentum, with some studies indicating a more supportive and empathetic attitude towards people living with HIV/AIDS compared to earlier literature. Additionally, advancements in testing technologies and public health initiatives have provided new opportunities to address barriers to testing uptake, although challenges such as stigma and misconceptions persist.

While there are similarities with previous literature, the review highlights ongoing challenges and areas for improvement in addressing HIV/AIDS among university students. Continual efforts are needed to build on progress, address persistent barriers, and promote a supportive and informed environment that encourages regular testing and proactive health behaviors among this population. Comparisons with previous literature provide valuable insights into evolving trends and highlight the need for targeted interventions tailored to the unique needs of university students.

Implications for Public Health and Education

Based on the findings of the systematic literature review, several recommendations can be proposed to improve knowledge and attitudes towards HIV/AIDS among university students. Firstly, comprehensive sexual health education programs tailored to university settings should be developed and implemented. These programs should provide accurate information about HIV/AIDS transmission, prevention methods, treatment options, and the importance of early testing. Incorporating interactive and culturally sensitive approaches into these programs can enhance engagement and effectiveness.

Destigmatization efforts are essential to promote empathy and reduce discrimination towards people living with HIV/AIDS. Campaigns aimed at challenging stereotypes and misconceptions, as well as fostering supportive environments, should be implemented both on campus and within wider communities. Peer-led initiatives and student organizations can play a crucial role in promoting awareness and acceptance.

Increasing accessibility and availability of rapid testing services on campus is critical in encouraging regular testing among university students. Testing services should be confidential, convenient, and culturally appropriate. Offering rapid testing in various locations on campus, including health centers, dormitories, and student centers, can help overcome logistical barriers and increase uptake.

Collaborations between universities, healthcare providers, and community organizations are essential in providing comprehensive support and resources for students. Promoting interdisciplinary research and collaboration can contribute to a better understanding of the factors influencing knowledge and attitudes towards HIV/AIDS among university students.

Ongoing evaluation and assessment of interventions are crucial to determine their effectiveness and identify areas for improvement. By implementing these recommendations, universities can contribute to creating a supportive and informed environment that empowers students to make informed decisions about their sexual health and promotes a culture of acceptance and empathy towards people living with HIV/AIDS.

Several strategies can be employed to increase awareness and acceptance of rapid testing for HIV/AIDS among university students. Firstly, educational campaigns should be implemented to raise awareness about the benefits and availability of rapid testing methods. These campaigns should provide accurate information about the convenience, confidentiality, and reliability of rapid tests, addressing common misconceptions and concerns.

Peer-led initiatives and student organizations can play a vital role in promoting awareness and acceptance of rapid testing. Peer educators can engage with their peers through workshops, presentations, and informational sessions to provide information about

testing options and encourage uptake. Additionally, involving student leaders and influencers can help amplify messaging and increase engagement.

Offering on-campus testing events and campaigns can increase accessibility and reduce barriers to testing. Mobile testing units, pop-up clinics, and testing drives can reach students in various locations, making testing more convenient and accessible. These events should be promoted through campus-wide communications channels and social media platforms.

Collaborations with university health services, counseling centers, and student health organizations can enhance awareness and acceptance of rapid testing. Integrating testing services into existing healthcare facilities and student support services can normalize testing and reduce stigma. Providing counseling and support services alongside testing can address emotional and psychological barriers to testing uptake.

Leveraging technology, such as mobile apps and online platforms, can increase awareness and facilitate access to testing services. Offering self-testing kits and telehealth consultations can provide students with confidential and convenient testing options.

A multi-faceted approach involving educational campaigns, peer-led initiatives, on-campus testing events, collaborations with healthcare providers, and technology-driven solutions is essential in increasing awareness and acceptance of rapid testing among university students. By implementing these strategies, universities can promote regular testing and early detection of HIV/AIDS, ultimately contributing to better public health outcomes within this demographic.

Strengths and Limitations

The research on university students' knowledge and attitudes towards HIV/AIDS and rapid testing possesses several strengths that enhance the reliability and comprehensiveness of its findings. Firstly, the review employed a comprehensive search strategy, utilizing multiple databases such as PubMed, Google Scholar, and Scopus, to ensure a thorough identification of relevant studies. This extensive search strategy minimized the risk of missing pertinent literature and provided a broad scope of evidence for analysis. Additionally, the inclusion criteria were clearly defined, encompassing various study designs, geographic locations, and populations, ensuring a diverse and representative selection of studies. By including studies published in different languages, the review aimed to minimize language bias and provide a more comprehensive understanding of the topic. Furthermore, the review employed a rigorous screening and selection process, conducted by multiple reviewers independently, to minimize selection bias and ensure the inclusion of high-quality studies. Overall, the systematic review's comprehensive search strategy, clear inclusion criteria, and rigorous selection process contribute to the strength and reliability of its findings, providing valuable insights into university students' knowledge and attitudes towards HIV/AIDS and rapid testing.

Despite its strengths, the research on university students' knowledge and attitudes towards HIV/AIDS and rapid testing also has several limitations that should be considered. One potential limitation is the possibility of publication bias, where studies with statistically significant results or positive findings are more likely to be published, leading to an overrepresentation of certain findings in the literature. Additionally, the review's focus on published literature may have excluded relevant studies that were not indexed in the selected databases or were unpublished, potentially introducing selection bias.

The review's scope may be limited by the availability and quality of studies on the topic. Despite efforts to include a wide range of study designs and geographic locations, there may be regions or populations underrepresented in the literature, which could impact the generalizability of the findings. Additionally, the majority of included studies may have been conducted in high-income countries, limiting the applicability of the findings to other contexts.

The review's reliance on self-reported data from included studies may introduce information bias, as participants' responses may be influenced by social desirability bias or recall bias. Additionally, the review may have missed studies conducted in languages other than English, potentially excluding valuable insights from non-English-speaking populations.

While efforts were made to ensure the quality and rigor of included studies, there may still be variations in study methodologies, sample sizes, and measurement tools, which could affect the comparability and synthesis of findings.

While the systematic review provides valuable insights into university students' knowledge and attitudes towards HIV/AIDS and rapid testing, it is important to interpret the findings within the context of these limitations. Future research should aim to address these limitations and provide more comprehensive and representative evidence on the topic.

Conclusion

The research on university students' knowledge and attitudes towards HIV/AIDS and rapid testing revealed several key findings. Firstly, while university students generally demonstrated a basic understanding of HIV/AIDS, significant gaps in knowledge persisted, particularly regarding transmission routes, prevention methods, and treatment options. Attitudes towards people living with HIV/AIDS were characterized by a complex interplay of empathy, stigma, and discrimination, with efforts needed to address misconceptions and promote acceptance. Awareness of rapid testing methods varied, with some students exhibiting willingness to undergo testing, but barriers such as stigma, misconceptions, and accessibility issues hindered uptake. Strategies to increase awareness and acceptance of rapid testing include comprehensive sexual health education, destigmatization efforts, and increasing accessibility of testing services. Despite these findings, the review also identified limitations, including potential bias and limited scope of studies, highlighting the need for further research to address these gaps. Overall, the review provides valuable insights into the challenges and opportunities in promoting HIV/AIDS awareness and testing uptake among university students, with implications for public health interventions and policy development.

The systematic literature review on university students' knowledge and attitudes towards HIV/AIDS and rapid testing offers several implications for future research. Firstly, there is a need for more longitudinal studies to track changes in knowledge, attitudes, and behaviors over time among university students. Longitudinal research can provide valuable insights into the effectiveness of interventions and the long-term impact of educational campaigns on HIV/AIDS awareness and testing uptake. Additionally, more qualitative research is needed to explore the contextual factors influencing knowledge and attitudes towards HIV/AIDS among university students in different cultural and social settings.

Future research should focus on identifying effective interventions to address barriers to rapid testing uptake among university students. Evaluating the effectiveness of educational campaigns, peer-led initiatives, and structural interventions in promoting awareness and acceptance of rapid testing is crucial. Additionally, research exploring innovative approaches, such as mobile testing units, self-testing kits, and telehealth consultations, can provide insights into expanding access to testing services.

There is a need for research that examines the intersectionality of factors influencing HIV/AIDS knowledge and attitudes among university students, including gender, age, sexual orientation, and socioeconomic status. Understanding how these intersecting identities shape perceptions of HIV/AIDS and testing behaviors can inform more tailored and targeted interventions.

Research exploring the impact of the COVID-19 pandemic on HIV/AIDS awareness and testing behaviors among university students is warranted. The pandemic may have disrupted traditional modes of education and access to healthcare services, potentially affecting knowledge levels and testing uptake. Investigating the pandemic's impact and identifying strategies to mitigate its effects on HIV/AIDS prevention efforts among university students is essential.

Ruture research should aim to address the identified gaps and limitations of existing literature, providing a more nuanced understanding of HIV/AIDS awareness and testing behaviors among university students and informing effective interventions and policies to promote sexual health and well-being within this demographic.

Bridging the gap in knowledge and attitudes among university students regarding HIV/AIDS and rapid testing is crucial for promoting sexual health and reducing the spread of the virus within this demographic. While progress has been made in increasing awareness and understanding, significant challenges remain. Addressing misconceptions, reducing stigma, and improving access to testing services are key priorities in fostering a more supportive and informed environment on campus.

Efforts to increase HIV/AIDS awareness and testing uptake should be comprehensive and multifaceted, encompassing educational campaigns, peer-led initiatives, and collaborations with healthcare providers. By promoting accurate knowledge, challenging stigma, and providing accessible testing options, universities can empower students to make informed decisions about their sexual health and contribute to the prevention and control of HIV/AIDS.

Interventions should be tailored to the specific needs and characteristics of diverse student populations, considering factors such as age, gender, sexual orientation, and cultural background. Engaging students as partners in the development and implementation of interventions can enhance relevance and effectiveness.

While there are challenges ahead, there is also immense potential for universities to play a pivotal role in promoting HIV/AIDS awareness and testing uptake among their student populations. By addressing the gaps in knowledge and attitudes, universities can create a supportive and inclusive environment that empowers students to take control of their sexual health and contribute to a future free from HIV/AIDS-related stigma and discrimination.

Acknowledgments

Thank you to LPPM University Putra Abadi Langkat, Lecturers and All who helped support this research activity until it was completed on time.

Authors' Contributions

All authors worked well and played their roles according to their main tasks, starting from collecting literature, resuming, writing, drafting, summarizing to sending to publishers for publication.

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