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ORIGINAL RESEARCH

Assessing the depth of knowledge about HIV among nurses working in the hospital: a descriptive study

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Abstract
Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome (HIV/AIDS) remains a critical global health challenge. Nurses play a pivotal role in providing care, including case finding, education, and counseling. However, misconceptions about HIV may lead to hesitation in treatment. Enhancing nurses' knowledge is crucial to boosting their confidence and competency. This descriptive quantitative study used a cross-sectional design to assess HIV knowledge among 386 nurses at a large hospital in Yogyakarta, selected through consecutive sampling. Participants met criteria such as active status, at least Diploma 3 education, and over one year of experience. Data were collected using the HIV-KQ-18 tool and analyzed via univariate and bivariate methods. Results showed a median knowledge score of 13 (range = 0-18). Scores were highest in HIV transmission knowledge and lowest in prevention. Significant differences in knowledge were linked to experience in patient care ($p < 0.001$), interaction history with HIV patients ($p < 0.001$), and participation in HIV-related training ($p = 0.038$). Despite generally good knowledge levels, gaps remain in HIV prevention. Enhancing experience, interaction, and training is recommended to better prepare nurses for effective care.

Keywords: HIV/AIDS, knowledge, medical nursing, nursing care, prevention

Introduction

HIV/AIDS remains a critical global health issue, affecting over 38 million people globally and 377.564 individuals in Indonesia as of 2019 (World Health Organization [WHO], 2024; Tim Kerja HIV dan PIMS, 2024). Yogyakarta ranks 15th among provinces with 6.330 reported cases among key populations such as homosexuals, drug users, prisoners, sex workers, and transgender individuals (Tim Kerja HIV dan PIMS, 2024). Approximately 23% of patients with HIV/AIDS in developing countries seek care due to opportunistic infections, stigma, discrimination, and substandard care (Álvarez Barreneche et al., 2017). Stigma in patients with HIV refers to the negative attitudes, beliefs, and discriminatory behaviors directed toward individuals living with the virus (Babel et al., 2021). This stigma can manifest as social exclusion, discrimination in healthcare, workplace inequities, and judgmental attitudes, all of which discourage patients from seeking diagnosis, treatment, and support (Turan et al., 2017). Internalized stigma may also lead to shame, depression, and reduced quality of life (Tran et al., 2019). Combating stigma involves education, supportive environments, confidentiality, and equitable healthcare practices among patients with HIV/AIDS **(Figure 1)**.

Nurses, as frontline healthcare providers, play an essential role in managing HIV/AIDS by offering education, counseling, and care (Rouleau et al., 2019). However, misconceptions and fears of HIV transmission contribute to reluctance among nurses to engage patients with HIV/AIDS. Studies from Indonesia and Ghana reveal a significant portion of nurses avoid patient interactions due to inadequate knowledge about HIV transmission and prevention (Urifah, 2017; Boakye & Mavhandu-Mudzusi, 2019). Misunderstandings, such as the belief that HIV can be transmitted through casual contact, perpetuate discomfort in caregiving roles (Suantari, 2021). Nurses' knowledge about HIV/AIDS is influenced by factors such as age, education level, work experience, and participation in HIV training (Huq et al., 2019). Comprehensive knowledge improves nursing competencies, ethical, safe, and effective care in clinical setting. Yet, many nurses lack sufficient understanding which creating barriers to quality service delivery. Interventions focusing on professional education and competency building are crucial to addressing these gaps. Moreover, the growing HIV/AIDS burden highlights the urgency for well-informed nursing practices (Tian et al., 2023). Nurses can significantly impact the fight against HIV/AIDS by delivering accurate health education, nurturing awareness, and demonstrating ethical care. Their role is instrumental in dismantling stigma and improving patient outcomes (Yin et al., 2021). This research underscores

JHNS
Journal of Holistic Nursing Science
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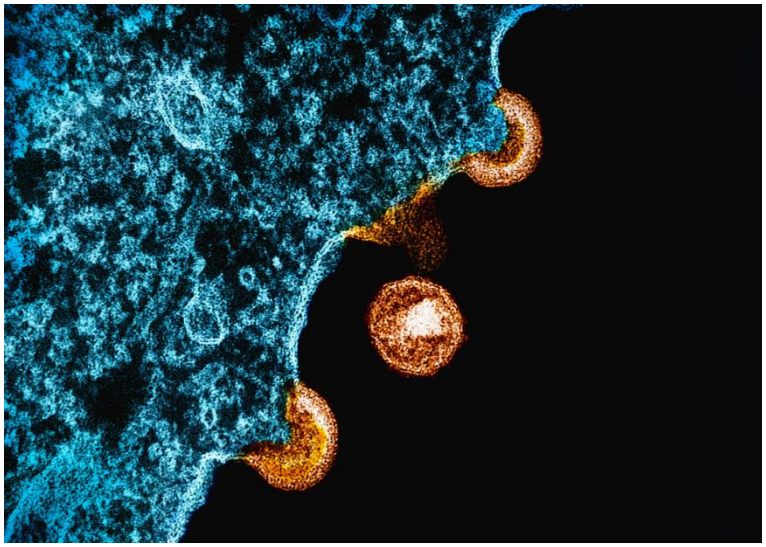

Figure 1. Illustration of HIV using microscopic view (Courtesy of www.unsplash.com).

the importance of assessing nurses' knowledge about HIV/AIDS, particularly in high-prevalence areas like Indonesia. It seeks to identify knowledge gaps and recommend strategies to enhance nursing competencies. Findings from this study could inform targeted training programs and equip nurses with the necessary tools to provide compassionate, high-quality care. Through education and experience, nurses can overcome misconceptions, gain confidence, and actively contribute to mitigating the HIV/AIDS epidemic.

In Indonesia, there are significant gaps in understanding HIV among healthcare professionals, particularly nurses, who play a central role in patient care. Despite being tasked with providing education, counseling, and treatment, many nurses lack adequate knowledge about HIV transmission, prevention, and management. This knowledge gap may stem from limited access to specialized training and insufficient integration of HIV-related content in nursing curricula. These gaps lead to hesitancy in caring for patients with HIV/AIDS in hospitals. Stigma and misconceptions surrounding HIV are prevalent among healthcare providers in Indonesia (Suantari, 2021). Many nurses continue to harbor fears of contracting the virus due to misunderstandings about its transmission. This situation affects their willingness to provide care and exacerbates feelings of isolation and discrimination. Research suggests that a lack of targeted training on HIV-related topics contributes to these challenges. Addressing these gaps is critical for creating a supportive and inclusive healthcare environment. This study is important in Indonesia because the country faces a rising number of HIV cases by recent estimates. Nurses' knowledge and attitudes directly impact the effectiveness of national HIV prevention and treatment programs. Identifying knowledge gaps and factors influencing nurses' understanding provides evidence to support targeted interventions, such as enhanced training programs and policy reforms. Improving nurses' knowledge is essential to reducing stigma, improving patient trust, and delivering high-quality care in patients with HIV/AIDS.

Method

This research employed a quantitative descriptive design with a cross-sectional approach. A quantitative descriptive design with a cross-sectional approach is a research method used to describe and analyze specific characteristics of a population at a single point in time (Capili, 2021). It employs numerical data to summarize variables and identifies relationships or differences within the population being studied (Kesmodel, 2018). This design is particularly useful for understanding current conditions, behaviors, or attitudes without manipulating variables, making it ideal for exploratory or observational research (Pérez-Guerrero et al., 2024). Data is typically collected through surveys, questionnaires, or existing records and analyzed using statistical techniques (Zimba & Gasparyan, 2023). Ethical approval was granted by the Faculty of Medicine, Public Health and Nursing, and RSUP Dr. Sardjito, with clearance number KE/FK/0352/2020. Conducted from January to February 2021 at RSUP Dr. Sardjito, Yogyakarta, data collection was facilitated online via Google Forms distributed through WhatsApp. A total of 386 participants were selected using consecutive sampling, with inclusion criteria requiring active nurses with at least a Diploma 3 education, over one year of experience, and willingness to participate. The study utilized the HIV Knowledge Questionnaire 18 (HIV-KQ-18), a validated and reliable instrument adapted from the original HIV-KQ-45 (Carey et al., 1997; Carey & Schroder, 2002). Its Indonesian version underwent rigorous testing with 344 nursing students, demonstrating validity and reliability (Cronbach's Alpha = 0.673).

The questionnaire consists of 18 items designed to measure HIV knowledge comprehensively, including aspects of prevention and transmission (Ursachi et al., 2015). Pilot testing confirmed its applicability for the study population. Data analysis involved both univariate and bivariate methods. Univariate analysis described respondents' demographic characteristics using percentages and frequencies, while nurses' total knowledge about HIV was summarized using median, minimum, and maximum values. Bivariate analysis, performed using Mann-Whitney and Kruskal-Wallis tests, assessed the relationships between independent variables and knowledge scores, with statistical significance set at $p < 0.050$.

JHNS
Journal of Holistic Nursing Science
E-ISSN: 2579-7751 P-ISSN: 2579-8472

The study provides a detailed methodology ensuring robust and ethical data collection. The inclusion of an online survey enabled broad participation while maintaining convenience and accessibility for respondents. The emphasis on validity and reliability in selecting the HIV-KQ-18 instrument underscores the study's rigor, ensuring that findings accurately reflect nurses' knowledge levels. The combination of descriptive and inferential statistical methods allows for a nuanced understanding of the factors influencing HIV knowledge among nurses. This methodological rigor strengthens the credibility of the findings and establishes a solid foundation for future research in HIV care **(Figure 2)**. The ethical approval for this study was granted by two entities. The Ethics Committee of the Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada approved the study on December 1, 2020, with the reference number KE/FK/0352/2020. Additionally, ethical approval was also obtained from RSUP Dr. Sardjito on December 28, 2020, with the reference number LB 02.01/XI/2.2/41823/2020. These approvals affirm the study's adherence to ethical guidelines, ensuring the protection and rights of all research participants.

Figure 2. Illustration of laboratory nursing research (Courtesy of www.pexels.com).

Results

This study included 386 nurses from RSUP Dr. Sardjito, whose HIV-related knowledge was assessed using the HIV-KQ-18 questionnaire. According to the study's data, the majority of respondents were in early adulthood (ages 26–35), comprising 148 individuals. Most participants were female, with 205 nurses, and the majority had a Diploma 3 level of education (240 nurses). Regarding experience, 204 respondents reported having interacted with patients with HIV/AIDS at least once, while 264 nurses indicated they had cared for patients at least once. However, the majority of respondents (327 nurses) had not received specific education or training related to HIV/AIDS **(Table 1)**. This tool includes 18 items, with a possible score range from 0 to 18. The median knowledge score was 13, with respondents scoring between 0 and 18. A Kolmogorov-Smirnov test confirmed that the scores were not normally distributed ($p < 0.00$), so the median was used as the measure of central tendency. Item analysis revealed that question 14, concerning HIV transmission, had the highest correct response rate. Conversely, question 12 addressing HIV prevention had the lowest correct response rate. The finding highlighted a potential gap in knowledge regarding preventive measures in HIV care **(Table 2)**.

Non-parametric tests, specifically the Mann-Whitney and Kruskal-Wallis tests, were applied to explore differences in knowledge scores across respondent characteristics due to the non-normal distribution of the data. These tests revealed significant associations between demographic variables and HIV knowledge levels ($p < 0.05$). Factors such as age, gender, educational background, and prior experience with patients with HIV/AIDS contributed to variations in scores, underscoring the influence of individual characteristics on nurses' understanding of HIV-related topics. The results emphasize the importance of tailoring educational interventions to address gaps in knowledge effectively. For instance, nurses who had direct interactions with patients or previous exposure to HIV-related training demonstrated higher knowledge scores compared to those without such experiences. These insights highlight the need for structured training programs that focus on practical exposure and specialized education, particularly for demographic groups with lower baseline knowledge. Addressing these disparities can enhance the overall competency of nursing staff and contribute to improve care reduce stigma in clinical settings **(Table 3)**.

Discussion

The findings of this study provide valuable insights into the knowledge and attitudes of nurses regarding HIV/AIDS, particularly in Indonesia. Nurses with higher degrees possess advanced knowledge and critical thinking skills that are essential for providing quality care to patients with HIV/AIDS (Suominen et al., 2010). Their education includes in-depth training on the complexities of HIV/AIDS, including the latest treatment protocols, patient management strategies, and understanding the psychosocial aspects of the disease. This foundational knowledge enables them to make informed

JHNS
Journal of Holistic Nursing Science
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clinical decisions, recognize complications early, and implement evidence-based practices (Maluleka et al., 2023). As the HIV treatment evolves, clinical nurses are better equipped to stay updated on new research and guidelines to ensure the care is current and effective (Kurniawan et al., 2023). Enhancing nurses' knowledge and abilities to care patients with HIV/AIDS will have an effect on nursing care quality and result in better patient center care. Additionally, it will raise satisfaction with the nursing care.

Table 1. Characteristics of Respondents.

Variables	*n*	Percentage (%)
Age		
Late Adolescence (17-25)	10	3
Early Adulthood (26-35)	148	38
Late Adulthood (36-45)	120	31
Early Elderly (46-55)	95	25
Late Elderly (56-65)	13	3
Gender		
Male	81	21.0
Female	305	79.0
Educational background		
D3	240	62.2
D4	12	3.1
S1	128	33.2
S2	6	1.6
History of interacting with patients		
Once	204	52.8
Never	182	47.2
Experience caring for patients		
Once	264	68.4
Never	122	31.6
Education/training in HIV/AIDS		
Once	59	15.3
Never	327	84.7

Experience plays an important role in the ability of nurses to deliver effective HIV care (Olivieri-Mui et al., 2020). Nurses who have worked directly with people living with HIV/AIDS develop a deeper understanding of the disease, its progression, and the challenges faced by patients. This hands-on experience improves empathy and compassion in building close relationships with their patients (Haribhai-Thompson et al., 2022). Furthermore, experienced nurses are often more adept at navigating the complexities of healthcare systems, advocating for their patients, and coordinating multidisciplinary care (Nsiah et al., 2019). Their familiarity with the unique needs of patients enables them to provide tailored interventions that address both medical and emotional aspects of care. The combination of higher education and practical experience significantly enhances the quality of care provided to HIV patients in hospital settings. These nurses are capable of delivering clinical care and play a vital role in educating patients about their condition, treatment options, and prevention strategies. Empowering patients with knowledge reduce stigma and promote adherence to treatment regimens (Bin Ahmad et al., 2024). Additionally, their expertise allows them to mentor and support less experienced staff within healthcare teams. Ultimately, the integration of educated and experienced nurses in HIV care leads to better outcomes, improved patient satisfaction, and a more supportive environment for individuals living with HIV.

The government acts as a cornerstone in shaping public health policies and initiatives aimed at combating HIV/AIDS (Kumah et al., 2023). One of the primary responsibilities is to promote awareness and education about the disease, its transmission, and prevention methods (Gaist et al., 2022). Funding and supporting comprehensive public health campaigns can disseminate accurate information that counters misconceptions and reduces stigma surrounding HIV/AIDS. These campaigns often target high-risk populations to ensure that vulnerable groups receive tailored education and resources. Additionally, governments can collaborate with non-governmental organizations (NGOs) and community-based organizations to reach marginalized communities, facilitating access to information and healthcare services

JHNS
Journal of Holistic Nursing Science
E-ISSN: 2579-7751 P-ISSN: 2579-8472

(Rajabi et al., 2021). This approach helps prevent HIV and encourage a well-informed society in reducing discriminatory attitudes toward patients with HIV/AIDS. As it widely acknowledged above that stigma remains one of the most significant barriers to effective HIV/AIDS care and prevention. Therefore, Governments play an essential part in tackling this issue by means of policy formulation and legislative action.

Table 2. Nurses' knowledge score.

Number	Statement Items	Correct answer	
		n	Percentage (%)
	Nurse knowledge score		
14	Having sex with more than one partner can increase a person's chance of being infected with HIV	375	97.2%
13	A person will not get HIV if she/he is taking antibiotics	360	93.3%
10	A woman caanot get HIV if she has sex with PLWHA during her period	342	88.6%
4	A woman can get HIV if she has anal sex with a man living with HIV/AIDS	341	88%
1	Coughing and sneezing do not spread HIV	336	87%
16	A person can get HIV if they use a sitting toilet, bathtub or swimming pool that has been used by PLWHA	320	82.9%
3	Pulling out the penis before a man climaxes/cums keeps a woman from getting HIV during sex with PLWHA	305	79%
2	A person can get HIV by sharing a glass of water with people living with HIV/AIDS (PLWHA)	293	75.9%
17	A person can get HIV from oral sex	293	75.9%
5	Showering or washing one's genitals after sex keeps a person from getting HIV	278	72%
8	There is a vaccine that can stop adults from getting HIV	271	70.2%
18	Using pelican oil on condoms such as Vaseline or baby oil can minimize the chances of contracting HIV	248	64.2%
15	Taking a test for HIV one week after having sex will tell a person if she or he has HIV	244	63.2%
6	All pregnant women infected with HIV will have babies born with AIDS	232	60.1%
11	There is a female condom that can help decrease a woman's chance of getting HIV	177	45.9%
7	People who have been infected with HIV, will quickly show serious symptoms of AIDS (eg diarrhea, high fever, weight loss)	172	44.6%
9	Someone will get HIV if they kiss (on the lips) and when kissing they put their tongue in the mouth of PLWHA	155	40.2%
12	Non-latex condoms can prevent HIV transmission better than condoms made of latex	108	28%

Moreover, enacting laws that protect the rights of individuals living with HIV can create a safer environment for these individuals (Parra-Barrera et al., 2022). The government can support initiatives that promote inclusivity and acceptance within communities, such as public forums, workshops, and training sessions that educate the public about HIV/AIDS and its impact. Actively working to dismantle stigma can encourage individuals to seek testing, treatment, and support without fear of judgment or discrimination. Nurses are often on the front lines of HIV/AIDS care, making their education and training a critical component of the healthcare response. Governments must invest in the professional development of nurses to provide them with the resources and training necessary. This includes incorporating HIV/AIDS education into nursing curricula, offering specialized training programs, and facilitating access to continuing education opportunities (Hays et al., 2022). Equipping nurses with up-to-date knowledge and skills can ensure that they are competent in managing HIV-related health issues, addressing patient concerns, and providing compassionate care both in community and clinical setting at the hospitals. Furthermore, supporting nurses through mentorship programs and

JHNS
Journal of Holistic Nursing Science
E-ISSN: 2579-7751 P-ISSN: 2579-8472

Figure 3. Illustration of governance meeting (Courtesy of www.pexels.com).

collaborative networks can enhance their confidence and competence in handling complex case which improving the quality of care for patients with HIV/AIDS. Likewise, the government has a vital role in promoting research and data collection related to HIV/AIDS. Funding studies that explore the epidemiology of HIV can gain valuable insights that inform policy and practice (John et al., 2023). Data collection efforts help identify trends, gaps, and areas needing attention within the healthcare system. This information is important for developing targeted interventions and allocating resources effectively. Moreover, advancing partnerships with academic institutions and research organizations can enhance the overall understanding of HIV/AIDS. This can lead to innovative solutions and evidence-based practices that improve care and reduce stigma. Through these efforts, the government can create a comprehensive and responsive healthcare system that addresses the multifaceted challenges of HIV/AIDS in worldwide **(Figure 3)**.

Table 3. Analysis among variables.

Characteristics	Median (Min-Max)	*p value*
Age		
Late Teen	13 (11-16)	
Early Adult	13 (0-18)	
Late Adult	13 (3-17)	0.061[a]
Early Elderly	13 (4-18)	
Late Elderly	11 (6-16)	
Gender		
Man	13 (0 - 18)	0.156[b]
Woman	14 (2 - 18)	
Level of education		
D3	13 (0 - 18)	
D4	13 (5 - 18)	0.111[a]
S1	13 (2 - 18)	
S2	15 (14 - 16)	
History of interacting with patients		
Yes	14 (6 - 18)	0.000[b]*
Not	12 (0 - 18)	
Experience caring for patients		
Yes	13 (4 - 18)	0.000[b]*
Not	12 (0 - 17)	
Education/training on HIV/AIDS		
Yes	14 (7 - 18)	0.038[b]*
Not	13 (0 - 18)	

* Significant with p value < 0.05, [a]Kruskal-Wallis, [b]Mann-Whitney.

One of the primary strengths of the study assessing the depth of knowledge about HIV among nurses in Indonesian hospitals is its descriptive design. The design allows for a comprehensive understanding of the current knowledge levels among healthcare professionals. Focusing on nurse sheds light on an essential aspect of healthcare delivery. The use of a well-structured questionnaire to assess knowledge enables the researchers to gather quantitative data that can be analyzed statistically. The finding can provide a clear picture of the knowledge gaps that exist. This information is

invaluable for informing targeted educational interventions and training programs aimed at improving nurses' competencies in HIV care. Despite its strengths, the study has several limitations that may impact the generalizability and applicability of its findings. One significant limitation is the potential for selection bias, as the sample may not represent the broader population of nurses across different regions of Indonesia. If the study was conducted in specific hospitals or urban areas, the results may not accurately reflect the knowledge levels of nurses in rural settings or smaller healthcare facilities where resources and training opportunities might differ significantly. Additionally, the reliance on self-reported questionnaires can introduce response bias, where participants may overestimate their knowledge or provide socially desirable answers rather than reflecting their true understanding of HIV/AIDS. The findings of this study, while informative, highlight the need for further research to build a more comprehensive understanding of HIV knowledge among nurses in Indonesia.

Conclusion

This study highlights that nurses working in the hospital possess a good baseline knowledge of HIV, particularly regarding its transmission. However, gaps in knowledge were evident in the area of HIV prevention. The findings indicate that nurses with prior experience in caring for HIV patients, regular interaction with HIV-positive individuals, and participation in specialized HIV-related training displayed significantly higher knowledge levels. These factors underline the importance of continuous professional development and practical exposure in enhancing nurses' competencies. Future studies should explore the impact of targeted educational interventions, such as simulation-based learning and interactive workshops, on improving nurses' knowledge and confidence in HIV care. Research could also examine the long-term retention of knowledge post-training and its translation into clinical practice. Additionally, comparative studies across various healthcare settings could provide insights into contextual challenges and opportunities for addressing knowledge gaps globally.

Author's declaration

All authors contributed to the study's conception, data analysis, interpretation, and manuscript preparation. Their collaborative efforts ensured a thorough exploration of the research topic and a comprehensive presentation of the findings.

AI statement

The author did not use any generative text artificial intelligence tools during the writing process of the manuscript.

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Availability of data and materials

All data are available from the authors.

Competing interests

The authors declare no competing interest.

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JHNS
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Authors' insight

Key points

- Nurses demonstrated good knowledge about HIV transmission.
- Nurses with prior experience in HIV care reflected the importance of structured learning opportunities.
- Addressing gaps through tailored programs on prevention is crucial to enhance comprehensive HIV care.

Emerging nursing avenues

- What are the primary gaps in HIV knowledge among nurses working in the hospital, as identified by this study?
- How do experience and specialized training influence nurses' knowledge levels about HIV?
- What strategies can be implemented to address the knowledge gaps among hospital nurses regarding HIV care?

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