

Original Research

Relationship Between Knowledge and Perception with HIV/AIDS Prevention Efforts in Key Populations

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ABSTRACT

Background: HIV transmission often occurs through unsafe sex, particularly with sex workers, making key populations crucial in the spread of HIV/AIDS. One key strategy to reduce HIV/AIDS morbidity and mortality is implementing prevention programs targeting at-risk groups. The study aims to examine the relationship between knowledge and perception and HIV/AIDS prevention efforts among key populations in Tangerang City.

Method: Quantitative with cross-sectional analytical correlation. A sample of 69 people was conducted by snowball technic sampling. This study used the HIV-KQ-18, HIV perceptions statements referring to the six components of the Health Belief Model theory and Behavioral Surveillance Survey (BSS). Data analysis was performed using the Chi-Square Test of Independence to assess the relationship between knowledge level, perception level.

Results: respondent characteristics Age ≥ 21 years 59.4%, high school education 69.7%, length of work ≥ 3 years 59.3%. Relationship between knowledge level and HIV/AIDS prevention efforts: p -value 0.002. Relationship between perception level and HIV/AIDS prevention efforts: p -value 0.002. Relationship between knowledge and perception and HIV/AIDS prevention efforts: p -value < 0.001 .

Conclusion: The study found that knowledge and perception significantly influence HIV/AIDS prevention among female sex workers. However, consistent prevention is hindered by personal, social, and structural barriers, including negotiation difficulties, economic dependence, stigma, and limited-service access. Effective interventions must be comprehensive, combining knowledge improvement with skills training, stigma reduction, barrier removal, and supportive policies.

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INTRODUCTION

HIV/AIDS remains a major global public health problem, having claimed an estimated 40.4 million lives so far with transmission continuing in all countries globally, with some countries reporting increasing trends in new infections where previously they

had declined. One of the goals of the national strategy to end AIDS cases by 2030 is: (1) reducing new HIV infections to less than 1.000 cases per year; (2) reducing AIDS-related deaths to less than 4.000 cases per year; and (3) reducing HIV and gender-related discrimination by 90% (Karver et al., 2022). This strategy emphasizes people living with HIV and at-risk populations including comprehensive, people-centered HIV services by maximizing equity and justice in access to HIV/AIDS services and solutions and addressing barriers by removing social and legal barriers to achieving an effective HIV/AIDS response.

Social, economic, individual behavioral factors, access to health services, and various environmental dynamics have played a role in the spread of HIV/AIDS in these communities. Through in-depth study of the existing literature, it is hoped that factors that have a strong correlation with the spread of HIV/AIDS in this city can be identified. This study is also expected to provide a basis for the development of more effective and targeted intervention strategies, as well as sustainable policies to reduce the incidence of HIV/AIDS among at-risk population groups. Efforts to combat HIV/AIDS require a comprehensive understanding of the main determinants that influence the spread of this disease among at-risk population groups. Through in-depth literature analysis, it is expected to find patterns, relationships, and crucial factors that can be the basis for more effective preventive and intervention actions in the future (Ocran et al., 2022).

Knowledge plays an important role in carrying out HIV/AIDS prevention efforts, because broad knowledge will form good perceptions and attitudes, this reacts to objects in a particular environment as a person's achievement of having knowledge. Therefore, knowledge and perception become the basis for the formation of morals in a person, meaning that there is harmony between knowledge and perception (Nur et al., 2022). The biggest obstacle in carrying out preventive measures against HIV/AIDS in Indonesia is that many people still do not know what HIV/AIDS is, how it spreads, and why people think that when they meet PLWHA, they can be infected directly and they should be kept away from the community (Wenas et al., 2021).

According to the HMB (Health Belief Model) theory, perception is influenced by a person's subjectivity, such as a person's perception of the vulnerability to contracting a disease (perceived susceptibility) in the case of HIV/AIDS, the perception of the seriousness (perceived severity) of a disease, both medical and social, including death, being ostracized by friends, family or society; positive perception (perceived benefit) and negative perception (perceived barrier) of preventive behavior and perception of one's ability to carry out preventive behavior (perceived self-efficacy) (Joorbonyan et al., 2022).

In previous research conducted by Noerliani (2022), it was stated that a person's perception can be influenced by the knowledge they have, so the right knowledge is needed by the community to improve existing negative perceptions. Good knowledge will result in high motivation in carrying out HIV examinations and prevention efforts. Based on this background, knowledge and perceptions will influence how individuals carry out HIV/AIDS prevention efforts.

The prognosis of HIV/AIDS is bad, and the virus can be deadly, so steps need to be taken to stop the transmission. Learning about HIV/AIDS and implementing acceptable behavior are two preventive measures that female sex workers can take to reduce the risk of infection. Knowledge comes from human sensing or learning about an object through the five senses. Of course, the extent to which an object is noticed and felt has a significant influence on the time it takes for the mind to produce information. An individual's close

reaction to a particular stimulus or item, which already includes related opinions and affective components, then a person's knowledge and perception will also have a significant influence on their behavior. A person's behavior in making efforts to prevent something will last longer if it is based on good knowledge and positive perception, and on the contrary (Vera & Rico, 2023).

UNAIDS data (2021) shows that women involved in sex work have a significantly higher incidence and prevalence of HIV than the general population, thus classifying them as a "key population." The incidence among sex workers remains significant and represents a source of transmission that requires priority addressing. Research on HIV/AIDS among female sex workers (FSW) generally focuses more on risky behaviors, such as frequency of condom use or number of sexual partners.

However, this study presents a novel approach by integrating knowledge and perception as important factors related to HIV/AIDS prevention efforts. This approach is rarely implemented simultaneously in the local context in Indonesia, particularly in red-light districts with their own social and cultural characteristics (Kang et al., 2024). This study integrates the knowledge variables and perception constructs of the Health Belief Model (HBM) in one analytical model to explain the variability in prevention practices (consistency of condom use, VCT examination, prevention service providers) among female sex workers in localized locations. Furthermore, this study used an instrument based on the WHO/UNAIDS Behavioral Surveillance Survey (BSS) modified for a local population (Ssenyonjo et al., 2024).

Thus, this study has the novelty of providing a more comprehensive picture of the relationship between knowledge, risk perception, and HIV/AIDS prevention practices among female sex workers, which can serve as a basis for developing behavior-based interventions to inform more effective public health policymaking. The objective of this study was to analyze the association between knowledge level, risk perception, and HIV/AIDS prevention efforts among female sex workers, and to identify key behavioral determinants that can strengthen targeted HIV prevention strategies in high-risk.

MATERIALS AND METHOD

Using quantitative research correlation analysis with this research design using a cross-sectional study design. The location of this research is the Dadap Village area, based on the consideration that commercial sex workers are a key population in HIV/AIDS transmission. The red-light district is a place with high levels of sexual interaction, inconsistent condom use, and limited access to health services. Therefore, research at this location is expected to provide a realistic picture of HIV/AIDS prevention behavior and generate relevant data as a basis for further public health interventions. Time: April to August 2025.

The population in this study consisted of all sex workers working in the Kampung Dadap red-light district. The sample consisted of 96 FSWs recruited using snowball sampling techniques, given the hidden nature of the population and the difficulty of identifying them directly. This approach enabled researchers to reach respondents through internal social networks, thereby increasing the feasibility and accessibility of sampling in high-risk groups.

The research instruments consisted of two questionnaires, namely the HIV Knowledge Questionnaire-18 (HIV-KQ-18) to measure the level of knowledge about HIV, and an HIV perception questionnaire containing 39 statements based on six components of the Health Belief Model theory. The HIV-KQ-18 instrument has been

proven to have strong construct validity and reliability in various international studies. Meanwhile, the HIV perception questionnaire was developed through content validity testing by experts and empirical validity testing using item-total correlations. Reliability testing was conducted using Cronbach's alpha coefficient to ensure the internal consistency of the instrument before it was used in this study.

Enumerators consisting of nine final semester students were tasked with providing three (3) questionnaires to be filled out. Assistant criteria: 7th semester nursing SI students, FIK UMJ. Procedure: Assistants were given an explanation of the main concepts of the research and snowball data collection techniques. The group division of nine enumerators was divided into three groups. Assistants were taught how to fill out the questionnaire. Assistants were taught to approach respondents assertively and humanely. Data collection began by asking for the telephone numbers of the neighborhood heads (Lurah, RT and RW heads) in each area of Kampung Dadap.

Data analysis was performed using the Chi-Square Test of Independence to assess the relationship between knowledge level, perception level, and HIV/AIDS prevention efforts among female sex workers. This test was chosen because all research variables were categorical with two groups, making it suitable for testing associations between variables. If the expected count in the contingency table was less than 5, the analysis was continued using Fisher's Exact Test as a more accurate alternative for small data sets. All analyses were conducted to determine whether there was a statistically significant relationship between the independent variables (level of knowledge and level of perception) and the dependent variable (HIV/AIDS prevention efforts).

In conducting this research, the researcher will conduct an ethics review to obtain research permitted from the FKK UMJ ethics review institution with the number: 0716/F-9-UMJ/VI/2025. After obtaining approval, the researcher will conduct the research adhering to several ethical principles, namely autonomy, confidentiality, nonmaleficence, beneficence, and justice. Each respondent will be given an informed consent form to maintain the ethical principles of research.

RESULTS

Table 1. Characteristics of Female Sex Workers (FSW) Respondents in Dadap Village (n=96)

| Variable | Category | Frequency (n) | Percentage (%) |
|--------------------------|--------------------|---------------|----------------|
| Age | < 20 years | 39 | 40.6 |
| | ≥ 21 years | 57 | 59.4 |
| | Total | 96 | 100.0 |
| Education Level | Elementary school | 0 | 0.0 |
| | Junior high school | 7 | 7.4 |
| | Senior high school | 67 | 69.7 |
| | Bachelor's degree | 22 | 22.9 |
| | Total | 96 | 100.0 |
| Length of Working | < 3 years | 39 | 40.6 |
| | ≥ 3 years | 57 | 59.4 |
| | Total | 96 | 100.0 |

The majority of respondents in this study were aged ≥ 21 years (59.4%), indicating that young adults were the dominant age group among sex workers in this location. In terms of education, most had a high school education (69.7%), indicating that the majority of respondents had a secondary education, with a small proportion having a bachelor's degree (22.9%) and very few having a junior high school education (7.4%). In addition, more than half of the respondents (59.4%) had been working for ≥ 3 years, reflecting relative stability and longer work experience in the localised environment. These findings indicate that the sample was dominated by young adults with secondary education and considerable work experience.

Table 2. Relationship of Knowledge Level and Perception Level With HIV/AIDS Prevention Efforts Among Female Sex Workers (n = 96)

| Variables | Category | Mild Prevention n (%) | High Prevention n (%) | Total n (%) | p-value* |
|-------------------------|----------|--------------------------|--------------------------|----------------|----------|
| Knowledge Level | Low | 12 (32.3) | 21 (67.7) | 33 (100) | 0.002 |
| | High | 24 (38.1) | 39 (61.9) | 63 (100) | |
| Perception Level | Negative | 40 (61.5) | 25 (38.5) | 65 (100) | 0.002 |
| | Positive | 10 (32.3) | 21 (67.7) | 31 (100) | |

Note: *Chi-Square Test

The results of the analysis in Table 2 show a significant relationship between the level of knowledge and perception and HIV/AIDS prevention efforts among female sex workers. Respondents with low levels of knowledge tended to have a lower proportion of prevention efforts (32.3%) compared to those with high levels of knowledge (38.1%), while the highly knowledgeable group showed a greater tendency to make better prevention efforts (61.9%).

Similar findings were seen in the perception variable, where respondents with negative perceptions were more likely to be in the low prevention efforts category (61.5%), while those with positive perceptions were more dominant in the high prevention efforts category (67.7%). The Chi-Square test showed a statistically significant relationship between the two independent variables (knowledge and perception) and HIV/AIDS prevention efforts ($p = 0.002$ each), confirming that increased knowledge and better perceptions contribute to increased preventive behaviour among female sex workers.

DISCUSSION

The study results showed a significant relationship between knowledge and perception levels and HIV/AIDS prevention efforts among female sex workers (FSW). The greater the respondents' knowledge regarding HIV/AIDS transmission and prevention, the better their preventive practices, such as consistent condom use and utilization of VCT services. This aligns with previous research indicating that increased knowledge is a key determinant of HIV/AIDS prevention behavior change in high-risk populations (Harzif et al., 2025). However, this study also found that high levels of knowledge do not always translate directly into effective prevention practices. In other words, simply knowing about the risks of HIV transmission and the importance of preventive measures such as condom use does not automatically lead to consistent protective behavior (Zhou et al., 2022).

Knowledge about HIV/AIDS in prevention efforts is very important for every individual, including female sex workers, who are one of the groups most vulnerable to HIV transmission. The results of the study showed that although many female sex workers have basic knowledge about HIV/AIDS, more in-depth knowledge about various prevention and treatment strategies is still limited. Most female sex workers in this study knew how HIV was transmitted, such as through unprotected sex. However, despite this basic understanding, many of them did not fully understand other more specific prevention methods, such as post-exposure prophylaxis (PEP) or the use of antiretroviral therapy (ARV) for those who are already infected (Babel et al., 2021).

This lack of in-depth knowledge can be caused by a lack of access to comprehensive sexual education and social barriers such as stigma against sex work. Factors that influence the level of knowledge and prevention efforts include access to information, education, and health services that are friendly to sex workers. Social stigma and economic barriers also greatly influence their decisions in carrying out prevention. (Bor et al., 2021).

Several respondents expressed that they found it difficult to access accurate information about HIV/AIDS, both from trusted sources and from health institutions. (Obeagu & Obeagu, 2024). This highlights the need for broader and more inclusive outreach that can reach this group, as well as the important role of non-governmental organizations and friendly health services in providing easy-to-understand education. In relation to prevention efforts, the results of the study showed that the majority of female sex workers already understand the importance of condom use as the main way to reduce the risk of HIV transmission.

However, not all of them are consistent in their use, especially in certain situations where they feel that economic conditions or pressure from clients make them unable to fully control condom use. These decisions are often related to economic issues, where some sex workers feel forced to accept certain conditions from clients for the sake of their survival. In addition to condom use, some female sex workers also routinely undergo health checks (Dery et al., 2024).

However, access issues are a major obstacle, as many stay in locations far from adequate health facilities or are afraid of the stigma that could arise if they are known to have visited a health clinic for an HIV test. There are several factors that influence knowledge and prevention efforts for HIV/AIDS in female sex workers. The first factor is access to education and information. Some female sex workers who have attended training or received education about HIV/AIDS tend to have better knowledge and make prevention efforts more consistently. Therefore, more structured and easily accessible education programs are essential to increase their awareness (Zizza et al., 2021).

The second factor is access to health services. Many female sex workers are hampered in obtaining adequate health services due to limited facilities that are friendly to this group. Health services that are non-discriminatory and provide accurate information are needed so that they feel safer to consult and get themselves checked. In addition, socio-economic factors also affect their habits in HIV prevention. Economic uncertainty often drives them to not be able to demand consistent condom use or to not undergo routine checks. (Alageel & Alomair, 2023).

The social stigma against sex work is a major obstacle to HIV/AIDS prevention efforts among female sex workers. They often feel ashamed or afraid to seek health services for fear of being stigmatized by society or medical personnel. This stigma creates

a sense of insecurity and prevents them from accessing information and health services that can help them protect themselves from HIV/AIDS (Babel et al., 2021).

Although many female sex workers are aware of the basic ways of HIV transmission and the importance of condom use, more in-depth knowledge about HIV/AIDS prevention and treatment is still limited. In addition, although prevention efforts such as condom use have been carried out, the lack of consistency in their implementation indicates various obstacles, both from their personal and socio-economic environment. Perceptions of HIV/AIDS and prevention efforts among female sex workers are very important because they can influence their behavior in reducing the risk of transmission. As one of the groups most vulnerable to HIV infection, female sex workers' perceptions about HIV/AIDS, risk factors, and prevention strategies play a crucial role in efforts to prevent HIV transmission. This study aims to explore how female sex workers perceive the risk of HIV/AIDS transmission and the preventive measures they consider important to take.

Individual perceptions of HIV risk can influence their preventive behaviors. Female sex workers often perceive themselves to be at high risk of HIV transmission, but this perception can vary depending on their knowledge, personal experiences, and socio-cultural factors they face. Perceptions of HIV/AIDS prevention, especially among female sex workers (FSWs), may have different views on effective ways to prevent HIV transmission, such as condom use, regular HIV testing, or pre-exposure prophylaxis (PrEP). Their perceptions of the effectiveness of these prevention methods are greatly influenced by their experiences, information received, and their social and economic conditions (Bor et al., 2021).

Several factors that can influence female sex workers' perceptions of HIV/AIDS and its prevention include their level of knowledge about HIV/AIDS, their personal experiences related to infection or transmission, pressure from clients, economic conditions, and the social stigma they often face. Many female sex workers perceive that they are in a group that is very vulnerable to HIV transmission. They realize that sexual intercourse that often does not use protection (condoms) increases the possibility of contracting HIV. However, there are also those who underestimate this risk, especially those who feel they are not directly exposed to or who have personal experience without contracting HIV.

Female sex workers' perceptions of HIV/AIDS are shaped by a combination of social, economic, and psychological pressures that influence their preventive behaviours. Many female sex workers understand that HIV can be asymptomatic for years, but the perception that 'not feeling sick means not being infected' is still common. This leads to low awareness of condom use and other prevention strategies, especially when pressure from clients is strong. Economic factors exacerbate the situation, as urgent income needs often force them to accept clients without consistently applying prevention measures (Health Research and Development Agency, 2019).

In addition to economic factors, social stigma plays a major role in shaping the perceptions and HIV/AIDS prevention behaviours of female sex workers. Many of them feel ashamed, afraid of being judged, or worried about discrimination when trying to access health services. This situation causes them to avoid HIV testing, health consultations, or valid information about prevention, even though they understand the high risks they face. The lack of health services that are friendly, inclusive, and sensitive to the needs of sex workers exacerbates barriers to access and reinforces distrust of the health system ((Moameri et al., 2024).

Efforts to improve HIV/AIDS prevention need to consider the complexity of factors that influence the perceptions and behaviour of female sex workers. More intensive and structured education about HIV/AIDS is essential to strengthen understanding and increase consistency in the use of prevention measures. In addition, access to more friendly and stigma-free health services, including routine HIV testing and support for PrEP use, needs to be expanded. Economic empowerment interventions and social stigma reduction campaigns are also strategic steps to improve the perceptions and ability of female sex workers to implement HIV prevention sustainably (Zhou et al., 2022).

The findings of this study have important implications for health services, particularly nursing practice. Nurses need to act as educators, counsellors, and advocates for female sex workers, ensuring that they receive accurate information and emotional and social support in HIV/AIDS prevention efforts. Healthcare services must be designed to be more friendly, accessible, and community-based in order to create a safe environment for this key population. Health policies should also support access to prevention and treatment services and reduce stigma against female sex workers as a high-risk group.

However, this study has limitations, including the use of snowball sampling techniques, which may introduce representation bias and limit the generalisability of the results. In addition, the research variables used simplified categorical data, which may not capture the complexity of prevention behaviours in greater detail. Therefore, further research is recommended using a mixed methods design to explore behavioural factors in greater depth, expand the sample size, and use measurement instruments with continuous scales for stronger and more comprehensive statistical analysis.

CONCLUSION

This study demonstrates that the level of knowledge and perception among female sex workers is significantly associated with HIV/AIDS prevention efforts. The study concludes that while knowledge is important, it is not sufficient to ensure consistent HIV/AIDS prevention among female sex workers. Preventive behaviors are strongly influenced by perceptions of risk, personal and structural barriers, and social support. Therefore, comprehensive interventions are required - combining education with skill development, improved service access, stigma reduction, and supportive health policies. For healthcare practice, this means nurses must act as educators, counselors, and advocates, while health services and policies must become more inclusive, accessible, and responsive to the needs of female sex workers as a key population in HIV/AIDS prevention.

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