Sains Medika: Jurnal Kedokteran dan Kesehatan

journal homepage: http://jurnal.unissula.ac.id/index.php/sainsmedika/

RESEARCH ARTICLE

Association between extramarital sexual activity, number of sexual partners, and HIV incidence among productive-age adults at H. Adam Malik general hospital, Medan

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ARTICLE INFO

Keywords:
HIV Occurrence
Extramarital Sexual Activity
Number of Sexual Partners
Productive Age

ABSTRACT

HIV/AIDS remains a critical global health challenge, characterized by significant morbidity and mortality. In 2022, Medan reported 1,543 HIV/AIDS cases, with the majority occurring in individuals aged 15–64 years. This study investigates the associations between extramarital sexual activity, the number of sexual partners, and the incidence of HIV among productive-age adults treated at H. Adam Malik General Hospital, Medan, Indonesia. An analytical observational case-control study was employed with 108 participants (54 cases and 54 controls). The analysis identified significant associations between extramarital sexual activities, the number of sexual partners, and HIV infection risk. These findings highlight the urgent need for strengthened global initiatives such as the "Getting to Zero" campaign, youth empowerment through NGOs, and enhanced public health education. Collaborative efforts involving the healthcare sector and government agencies are critical to improving HIV prevention strategies and reducing transmission rates.

1. Introduction

The Human Immunodeficiency Virus (HIV) compromises the immune system by infecting white blood cells, leading to progressive immune dysfunction (WHO, 2014). Acquired Immunodeficiency Syndrome (AIDS) represents the advanced stage of HIV infection, characterized by severe immune suppression and an increased vulnerability to opportunistic infections (Ministry of Health, 2014). Although the transition from HIV to AIDS typically occurs gradually, symptoms may remain absent for about ten years after the initial infection. Sexual contact accounts for the majority (75%) of HIV transmissions globally (Sitepu, 2018).

HIV is a cytopathic virus belonging to the Lentivirus genus, the Lentiviridae subfamily, and the Retroviridae family. As a retrovirus, it is an RNA virus with a molecular weight of about 0.7 kilobases. Two main types of HIV, HIV-1 and HIV-2, have been identified, each with several subtypes (United States Preventive Services Task Force, 2011). The pathogenesis of HIV/AIDS is linked to significant weight loss, chronic diarrhea lasting over a month, persistent fever, recurrent urinary tract infections, and severe lower respiratory infections (Ruterlin & Tandi, 2014). These symptoms arise from the virus targeting white blood cells, ultimately impairing the immune system's function.

Globally, HIV/AIDS continues to be a significant public health issue. As of March 2021, Indonesia reported 427,201 cases of HIV and 131,417 cases of AIDS. Approximately 70% of these infections were linked to sexual transmission among key populations, including sex workers, men who have sex with men

https://doi.org/10.30659/sainsmed.v15i2.33191

(MSM), transgender individuals, and their sexual partners (UNAIDS, 2021). Worldwide, the majority of the 36.7 million HIV cases occur in individuals aged 15 years and older, highlighting the burden of HIV within the productive age group.

Engaging in premarital or extramarital sexual relationships can create emotional bonds that increase the likelihood of risky behaviors, especially when these attachments involve multiple or non-monogamous partners (Chalimah & Mubarok, 2020). Unprotected sexual intercourse is still the primary method of HIV transmission, and having multiple sexual partners considerably heightens the risk of infection. A study found that individuals with more than one sexual partner are 23.32 times more likely to contract HIV/AIDS compared to those with a single partner ($p = 0.003$; OR = 23.321; 95% CI = 2.969–183.187) (Musyarofah *et al.*, 2017).

In Indonesia, the Ministry of Health categorizes the population into three age groups: young (under 15 years), productive (15–64 years), and non-productive (over 64 years). In the first quarter of 2021, the highest prevalence of HIV/AIDS was observed in the 25–49 age group (71.3%), followed by the 20–24 age group (16.3%) and the 15–24 age group (19%) (Ministry of Health, 2017). HIV/AIDS has significant socio-economic implications, particularly for individuals in the productive age group. Infected individuals often face decreased productivity, economic hardships, and stigma or discrimination that hinder their ability to secure employment or advance their careers (Ohrnberger & Hauck, 2020; Utami *et al.*, 2020). These factors highlight the urgent need for targeted prevention, treatment, and support programs to address the multifaceted impacts of HIV/AIDS.

2. Materials and Methods

2.1 Study Design, Setting and Duration

This study utilized an analytical observational approach with a case-control design to investigate sexual behavioral factors associated with HIV incidence among individuals of productive age (15–64 years) at RSUP H. Adam Malik Medan. The case-control design facilitated the comparison of exposure to risk factors between cases and controls. The study took place at RSUP H. Adam Malik Medan in North Sumatra Province from March 20 to April 20, 2023.

2.2 Population and Sampling

The case group included individuals aged 15 to 64 years who were diagnosed with HIV and recorded in the hospital's medical records. The control group comprised individuals aged 15 to 64 years with no history of HIV, also identified through the hospital's medical records. Both groups were selected based on inclusion and exclusion criteria. The inclusion criteria for the case group were individuals aged 15 to 64 years diagnosed with HIV, while the control group included individuals aged 15 to 64 years without an HIV diagnosis. The exclusion criteria for both groups encompassed individuals with a family history of HIV, those who had blood transfusions, or those who engaged in intravenous drug use involving needle sharing

A simple random sampling technique ensured equal selection probability for all eligible participants. Participants in the case group were identified by reviewing secondary data from the PUSYANSUS outpatient clinic and interviewing selected HIV patients. Control group participants were identified from secondary data of patients with negative HIV results from laboratory records, followed by interviews.

2.3 A formula was used to calculate the difference in proportions between the two groups, which determined a minimum sample size of 51. An additional 5% was added to account for potential dropouts, resulting in a final sample size of 54 for each group (case and control), leading to a total sample size of 108.

2.4 Data Collection

Both primary and secondary data were used. Secondary data were obtained from medical records to identify eligible cases and controls. Primary data were collected through structured questionnaires designed to assess sexual behavior variables.

2.4. Data Analysis

Univariate analysis included frequency distributions and percentages to describe respondent characteristics and sexual behavior variables. Bivariate analysis employed the chi-square test to assess associations between categorical variables and calculate odds ratios (OR). The dependent variable was the incidence of HIV infection, while the independent variables were engagement in extramarital sexual activity and the number of sexual partners. Hypothesis testing was performed at a 5% significance level, with a p-value of <0.05, indicating a statistically significant association between the independent variables and HIV incidence.

3. Results

A total of 108 respondents participated in this study, evenly divided into 54 cases (individuals with HIV) and 54 controls (individuals without HIV). The characteristics of respondents in both the case and control groups are detailed in Table 1. The majority

Table 1. Distribution of respondent characteristics based on the case and control groups

Characteristics	Number of Sample in Each Group (%)		95% CI Case
	Case	Control	
Gender			
• Male	49 (90.7)	26 (48.1)	0.602-0.774
• Female	5 (9.3)	28 (51.9)	0.226-0.398
Age			
• Late Adolescence	7 (13.0)	6 (11.1)	0.000-0.041
• Early Adulthood	23 (42.6)	33 (61.1)	0.000-0.041
• Late Adulthood	21 (38.9)	15 (27.8)	0.000-0.041
• Early Elderly	3 (5.6)	0 (0.0)	0.000-0.041
Extramarital Sexual Activity			
• Yes	42 (38.9)	12 (5.6)	0.407-0.593
• No	12 (11.1)	42 (38.9)	0.000-0.041
Number of Sexual Partners			
• More than 1 Person	35 (32.4)	12 (5.6)	0.311-0.493
• 1 Person	12 (11.1)	42 (38.9)	0.000-0.041

Table 2. Relationship between extramarital sexual activity, number of sexual partners, and HIV incidence

Parameter	HIV incidence in each group (%)		*p* Value	OR (95% CI)
	Case	Control		
Extramarital Sexual Activity				
• Yes	42 (38.9)	12 (11.1)	0.000	12.250 (4.944 – 30.350)
• No	12 (11.1)	42 (38.9)		
Number of Sexual Partners				
• More than 1 Person	35 (32.4)	8 (7.4)	0.000	10.592 (4.155 – 27.001)
• 1 Person	19 (17.6)	46 (42.6)		

of respondents in the case group were male (90.7%), while the control group had a higher percentage of females (51.9%). In terms of age, the early adulthood group (21–35 years) was the most represented in both the case (42.6%) and control (61.1%) groups. A noteworthy observation was that extramarital sexual activity and having multiple sexual partners were primarily associated with the case group. In contrast, monogamous relationships were more prevalent in the control group.

Bivariate analysis was conducted to determine the relationships between extramarital sexual activity, the number of sexual partners, and HIV incidence. The results are summarized in Table 2. Respondents who engaged in extramarital sexual activity were significantly more prevalent in the case group (38.9%) compared to the control group (11.1%). The chi-square test yielded a p-value of 0.000, indicating a significant relationship between extramarital sexual activity and HIV incidence. The odds ratio (OR) was 12.250, suggesting that individuals engaging in extramarital sexual activity were 12.250 times more likely to have HIV compared to those who did not engage in such activities. Similarly, respondents with more than one sexual partner were more common in the case group (32.4%) than in the control group (7.4%). The chi-square test for this parameter also produced a p-value of 0.000, indicating a significant relationship. The OR for having more than one sexual partner was 10.592, signifying that individuals with multiple partners were 10.592 times more at risk of HIV infection compared to those with only one partner.

4. Discussion

Extramarital sexual activity is significantly linked to HIV incidence. Individuals who engage in extramarital sexual activity are 12.25 times more likely to experience HIV incidence compared to those who participate in sexual activity within marriage. This finding aligns with previous research by Uliani *et al.* (2020) at UTD PMI Central Sulawesi Province, which indicated that engaging in extramarital sexual activity poses a higher risk of HIV incidence than participating in sexual activity within marriage. Maryatun (2013) reported that most adolescents (84%) engaged in premarital sexual behavior, with 62% indicating that

 https://doi.org/10.30659/sainsmed.v15i2.33191

peer influence played a role. Peer influence can increase the likelihood of engaging in premarital sexual behavior by up to 19.727 times compared to respondents not influenced by peers. Peers also serve as a significant source of information about sex in shaping adolescents' knowledge, attitudes, and sexual behavior (Rahadi & Indarjo 2017). Based on field observations, it was found that several factors influence the prevalence of extramarital sexual activity. Among these factors are curiosity about sexual relations, economic factors, environmental factors, and biological needs, which may lead individuals to engage in such activities. Another result is the presence of respondents who are HIV-positive but engage in sexual activity within marriage. This occurs because they are unaware of their partner's background or health status, as their partner had engaged in sexual relations with multiple partners before marrying them. However, it is essential to note that extramarital sexual activity was not considered as a variable in this study.

The number of sexual partners is significantly associated with HIV incidence. Individuals who have more than one sexual partner are at a 10.592 times higher risk of experiencing HIV incidence compared to those who have only one sexual partner. This finding aligns with previous research in Kendal by Musyarofah *et al.* (2017), who reported that having more than one partner poses a higher risk of HIV/AIDS incidence compared to individuals with just one sexual partner. Muryani *et al.* (2018) reported a relationship between the number of sexual partners and HIV incidence. The majority of HIV cases were among males, with over 25% of respondents indicating that they had engaged in sexual intercourse with more than 50 women (Butt *et al.*, 2002).

Individuals with multiple sexual partners, whether in homosexual or heterosexual relationships—such as women or men with irregular sexual behavior, clients of sex workers, pimps, homosexual groups, bisexual individuals, and transgender individuals—are at risk of contracting AIDS. Initially, AIDS was thought to primarily affect homosexual men in same-sex relationships. However, it is now understood that AIDS can infect anyone through various modes of transmission (Shan et al 2022).

The role of peers significantly impacts the behavior of respondents at risk for HIV/AIDS (Handayani *et al.*, 2018). As many as 96.4% of the respondents involved in these cases have friends who engage in risky behaviors, such as having multiple partners, engaging in same-sex relationships, getting tattoos, using drugs, and, for males, having body piercings. Furthermore, parental involvement is associated with the occurrence of HIV. Kharsany & Karim (2016) reported that HIV most commonly occurs among adolescents and young women, due to their limited ability to protect themselves from infection. Therefore, the role of the family is crucial in providing protection and education in this context regard. Based on field observations, it was found that having multiple partners often occurs at a young age. The initial desire for this behavior is often driven by a desire to satisfy one's desires without being married, and it is also driven by the need to meet one's socioeconomic needs, such as becoming a commercial sex worker. However, it was also discovered that having only one partner can still lead to HIV infection. This is because their previous partners may have had multiple partners before being with them.

The importance of prevention efforts in the community, particularly regarding the number of partners, highlights the need to develop programs as advocated by the Ministry of Health (Turi *et al.*, 2023). These programs aim to prevent transmission, especially among individuals who are not infected, and to assist those who are infected in avoiding the transmission of the virus to others or their partners. Enhancing community self-reliance in HIV and AIDS mitigation efforts through national, regional, and global collaboration on legal aspects, organizations, funding, healthcare facilities, and human resources is essential (Permenkes No. 21, 2013). The policy for controlling HIV/AIDS follows global guidelines known as 'Getting to Zeros,' which encompasses three main objectives: 1. Reducing and ultimately eliminating the number of new HIV infection cases, 2. Reducing and ultimately eliminating deaths related to AIDS-related conditions, and 3. Eliminating discrimination against People Living with HIV/AIDS (ODHA) (Permenkes, 2016). The emergence of HIV/AIDS control policies aligning with the global 'Getting To Zeros' PERMENKES 2013 concerning the Handling of HIV/AIDS. This regulation aims to achieve several objectives, including reducing and ultimately eliminating new HIV infection cases, reducing and ultimately eliminating deaths related to AIDS-related conditions, eliminating discrimination against ODHA, improving the quality of life for ODHA, and reducing the socio-economic impact of HIV/AIDS on individuals, families, and communities (Fauzi *et al.*, 2023).

The role of parents is crucial in nurturing, teaching, educating, and setting an example for their children, enabling them to understand, recognize, and ultimately adopt behaviors that align with the values and norms prevailing in society (Deysolong, 2023). Some preventive efforts to address the impact of risky sexual behavior include religious and moral education. Religious education should be provided to children from an early age. With a strong religious foundation

embedded in them, children can use this knowledge as a filter in their lives. They can distinguish between actions that should be undertaken and those that should be avoided.

5. Conclusions

The extramarital sexual activity and the number of sexual partners were ascociated to HIV incidence at RSUP H. Adam Malik Medan. The highest incidence of HIV was found among adolescents and young adults in the productive age group, reflecting their vulnerability due to limited capacity for self-protection. This underscores the critical role of families and government in implementing preventive measures and education to mitigate the spread of HIV. Efforts must focus on holistic prevention strategies, including community education, family involvement, and adherence to international and national policies, to address the HIV epidemic effectively and sustainably.

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