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Understanding HIV transmission and prevention among men who have sex with men in a sexual health clinic

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ABSTRACT

This comprehensive study investigates the knowledge, attitudes, and practices (KAP) concerning human immunodeficiency virus (HIV) transmission and prevention among men who have sex with men (MSM) in a sexually transmitted infections (STI)-friendly clinic in Johor, Malaysia. Utilizing a cross-sectional design, the study analyses data from 421 MSM patients, emphasizing the critical role of sociodemographic factors in influencing HIV-related behaviors. The majority of participants, mostly with tertiary education, displayed a sound understanding of HIV, with 71% showing good knowledge on HIV prevention and transmission. However, there remain gaps in knowledge, particularly among those with lesser education, and in practices related to condom use and pre-exposure prophylaxis (PrEP). The study highlights a stark disparity in HIV-related attitudes and practices based on education level, employment status, and income. Notably, those with higher education and income levels demonstrate more responsible practices and better knowledge, underscoring the need for tailored educational programs. The findings call for comprehensive and targeted interventions, considering the diverse backgrounds of individuals, to effectively mitigate the risk of HIV infection. This research is vital in the absence of a definitive cure for HIV and acquired immune deficiency syndrome (AIDS), emphasizing preventive measures based on accurate information and positive attitudes towards the disease.

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1. INTRODUCTION

Human immunodeficiency virus (HIV), a retrovirus attacking the immune system, particularly CD4 cells, poses a significant global public health challenge [1]. HIV transmission occurs through contact with infected bodily fluids, including through sexual activities, blood transfusions, sharing of contaminated needles, and from mother to child during pregnancy, childbirth, and breastfeeding [2]. The risk of transmission varies, with a heightened risk in individuals with untreated sexually transmitted infections (STIs) [3]. Globally, HIV's prevalence remains high, with an estimated 37.9 million people living with HIV. The Joint United Nations Programme on HIV and acquired immune deficiency syndrome (AIDS) (UNAIDS) reports that South Africa and Nigeria have the highest numbers of HIV-positive individuals [4]. The spread of HIV has reached all continents since its presumed origin in the Democratic Republic of Congo around 1920, with significant numbers of people living with HIV in the United States by 1982 [5]. The global spread primarily affects key populations including people who inject drugs (PWID), female sex workers (FSW),

transgender individuals, and men who have sex with men (MSM), with the latter group accounting for a significant portion of new infections.

In Tanzania, condom use, and HIV knowledge are low among young populations, highlighting the need for improved sexual education [6]. Similarly, Sudanese university students exhibit a poor understanding of HIV/AIDS, with low awareness of preventive measures [7]. In the United States, a significant proportion of new HIV cases arise from male-to-male sexual contact, with education and prevention efforts urgently needed [8]. African MSM faces a disproportionate HIV burden, with educational gaps in HIV prevention and transmission. Studies in China reveal increasing HIV incidence among MSM, with low condom use and high levels of sexually transmitted disease (STD) infections [9]. Sub-Saharan Africa shows similar trends, with cultural and religious factors contributing to low knowledge levels [10].

Furthermore, African American MSM in the United States, particularly in Georgia, face high HIV risks linked to lower condom use self-efficacy and inadequate HIV knowledge [11]. In India, MSM fear discrimination, impacting their willingness to know their HIV status. In Malaysia, the epidemic initially driven by PWID has since shifted towards sexual transmission, particularly among MSM. The rate of HIV infection in the MSM community has seen a marked increase, rising from 8.9% in 2014 to 21.6% in 2017, reflecting this shift in transmission dynamics [12]. This trend mirrors global patterns where MSM populations experience an increasing burden of HIV, in most regions like Asia, Central Europe, and North America [13]–[17]. The changing patterns of HIV transmission highlight the need for targeted interventions and awareness programs, especially in communities and demographics most affected by this epidemic [18].

The research aims to comprehensively assess the knowledge, attitude, and practice (KAP) regarding HIV transmission and prevention among MSM in STI-friendly clinics. This includes detailing the socio-demographic characteristics of the respondents, exploring their attitudes toward HIV transmission and prevention, evaluating their knowledge about these topics, and determining their actual practices related to HIV transmission and prevention. Additionally, the study seeks to establish the correlation between KAP and socio-demographic characteristics. The research questions focus on the level of knowledge about HIV prevention and transmission among MSM visiting the clinic and the relationship between their knowledge, attitudes, practices, and socio-demographic aspects. The significance of this study lies in it is potential to identify gaps in knowledge, attitude, and practice concerning HIV among MSM patients in STI clinics, thereby informing intervention strategies and educational efforts, particularly for the younger generation. These efforts are critical in the absence of a definitive cure for HIV and AIDS, underlining the importance of preventive measures based on accurate information and positive attitudes toward the disease.

2. METHOD

This study adopts a cross-sectional design to evaluate the KAP regarding HIV transmission and prevention among MSM in an STI-friendly clinic, in Johor, Malaysia. The research focuses on collecting data at a specific point in time to minimize biases, such as recall bias. Participants are given questionnaires to complete during their clinic visit, ensuring immediate data collection and relevance to the study's objectives and hypotheses. The study site was selected for its distinction as the first STI-friendly clinic in the area, offering specialized sexual health services and staffed by trained, customer-oriented medical personnel. The ethical approval for this study was obtained from the Ministry of Health Malaysia's ethical board, under the reference number NMRR-20-1139-55102.

The sample size, calculated using openepi.com, was set at 410 participants, considering a 50% anticipated frequency, a 95% confidence interval, and a 5% absolute precision, with an additional allowance for a 10% dropout rate. A non-probability convenience sampling method was employed, selecting the first 410 patients registered at the clinic. Respondents are given 30 minutes to complete the anonymous questionnaire, ensuring confidentiality. The questionnaire, based on the modified integrated bio-behavioral surveillance (IBBS) 2017, comprises 21 fixed-response questions. A pilot test for reliability was conducted using Google Forms distributed unrelated to the study population. This pilot study used the Alpha-Cronbach reliability test, yielding values indicating good to very good internal consistency. The study population consists of MSM patients visiting the clinic for STD treatment, with inclusion criteria focusing on Malaysian or non-Malaysian citizens aged 18 to 65 who understand Malay or English. Exclusion criteria include unwillingness to participate or inability to speak the specified languages. Participants have the right to withdraw at any time, with withdrawals handled as per the study's ethical guidelines. The data analysis for this study on HIV transmission and prevention among MSM was conducted using SPSS version 23. Descriptive data were presented as mean ± standard deviation (SD). One-way ANOVA was used for analyzing normally distributed variables, and Kruskal-Wallis ANOVA was used for non-normally distributed data. Categorical data were analyzed using the Chi-square test, considering a p-value of <0.01 as statistically

significant. The analysis involved both parametric and non-parametric tests, depending on the nature of the variables (categorical or continuous) and their distribution.

The study incorporates various independent variables: age, education level, ethnicity, marital status, nature of job, and average income. The dependent variables include knowledge on HIV transmission and prevention, attitude on HIV transmission and prevention, and practice on HIV transmission and prevention. Definitions for each variable are clearly outlined to ensure clarity and accuracy in data collection and analysis. The assessment of knowledge on HIV transmission and prevention involves five specific questions, with scoring categorized as Good (5/5), Moderate (4/5), or Poor (<3). Similarly, practice on HIV transmission and prevention is evaluated through eight detailed questions. The study also examines attitudes towards HIV transmission and prevention with five targeted questions. The structured approach in defining and scoring the variables, coupled with the use of robust statistical methods, ensures a thorough and systematic analysis of the data collected, aiming to provide valuable insights into the KAP regarding HIV among MSM in the context of an STI-friendly clinic.

3. RESULTS AND DISCUSSION

Table 1 details the sociodemographic data of 421 respondents, highlighting that the majority (59.1%) had tertiary education, with Malays constituting the largest ethnic group (48.7%). A significant proportion of participants were unmarried (63.9%), and the most common income bracket was RM1500-1999 (42.3%). Professional jobs were held by 25.2% of respondents, indicating a diverse occupational background within the study population. Table 2 reveals participants' understanding of HIV transmission and prevention, with a majority recognizing the effectiveness of condoms (78.6%) and monogamous relationships (78.9%) in reducing risk. There's a high awareness (75.3%) that HIV can be present in healthy-looking individuals, while misconceptions about transmission through mosquito bites are low (5.2%). All participants correctly identified that sharing food does not transmit HIV. Figure 1 displays the overall knowledge levels, with a substantial 71% of participants demonstrating good knowledge about HIV, 4% having moderate knowledge, and a notable 25% possessing poor knowledge, indicating areas where educational interventions may be needed. Table 3 showcases practices related to HIV prevention and transmission among participants. A slight majority reported using condoms during sex (56.1%) but less than half had access to condoms over the past year (47.5%). Awareness of pre-exposure prophylaxis (PrEP) was low (30.6%), with only a small fraction on PrEP (10.0%). Condom use in the last anal intercourse was reported by only 14.7%. Casual sex with men was noted by 28.7%, and a minority reported sex with women (18.5%) or sex workers (2.6%).

Table 1. Sociodemographic characteristics of respondents (N=421)

Variables	Characteristic	Frequency (%)
Education level	Tertiary	249 (59.1)
	Secondary	133 (31.6)
	Primary	36 (8.6)
	No formal	3 (0.7)
Ethnicity	Malay	205 (48.7)
	Indian	106 (25.2)
	Chinese	97 (23)
	Others	13 (3.1)
Marital status	Unmarried	269 (63.9)
	Divorced	10 (2.4)
	Married	142 (33.7)
Average income	<RM 500	57 (13.5)
	RM500- RM999	30 (7.1)
	RM1000-RM1499	77 (18.3)
	RM1500-1999	178 (42.3)
	>RM2000	79 (18.8)
Nature of job	Not working	78 (18.5)
	Not professional	61 (14.5)
	Professional	106 (25.2)
	Self-employed	67 (15.9)
	Others	109 (25.9)

Table 4 reveals attitudes towards HIV prevention and transmission. All participants felt no risk of HIV infection, and a small percentage were receiving antiretroviral (ARV) treatment (10.9%). Only 12.6% reported that their permanent partners had undergone HIV testing. While a minority had ever been tested for HIV (18.8%), a majority knew where to go for testing (77.2%). The Chi-square statistics presented in Table 5 show robust and statistically significant relationships between sociodemographic variables-education level,

employment status, and average income and different aspects of HIV prevention and transmission knowledge, practice, and attitude. A particularly strong association is observed between education level and knowledge (χ^2=410.35 with 6 degrees of freedom), underscoring the critical role of education in informing individuals about HIV. Employment status also significantly correlates with both knowledge and practices related to HIV prevention (χ^2=135.682 and 47.727 respectively), highlighting employment as a factor in accessing and utilizing HIV-related information and services. Average income is another influential factor, with significant associations indicating that higher income levels may contribute to increased knowledge and more responsible practices (χ^2=165.553 and 117.94).

Table 2. Knowledge on HIV transmission and prevention

Question	Yes (Frequency, %)	No (Frequency, %)
Use of condoms reduces HIV risk	331 (78.6)	90 (21.4)
Healthy-looking persons can have HIV	317 (75.3)	104 (24.7)
HIV transmission through mosquito bites	22 (5.2)	399 (94.8)
Monogamous relationships reduce HIV risk	332 (78.9)	89 (21.1)
HIV transmission through sharing food	0	421 (100)

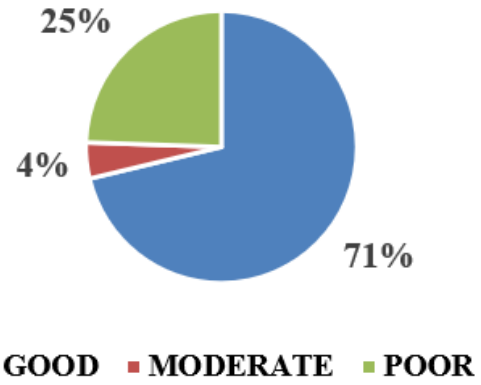

Figure 1. Knowledge level of participation

Table 3. Practice on HIV prevention and transmission

Question	Yes (Frequency (%))	No (Frequency (%))
Ever used a condom during sex	236 (56.1)	185 (43.9)
Access to condoms in the last 12 months	200 (47.5)	221 (52.5)
Awareness of pre-exposure prophylaxis (PrEP)	129 (30.6)	292 (69.4)
Currently or previously on PrEP	42 (10.0)	152 (36.1)
Used a condom in the last anal sex	62 (14.7)	128 (30.4)
Casual sex with men in the last 12 months	121 (28.7)	300 (71.3)
Sex with a woman in the last 12 months	78 (18.5)	343 (81.5)
Sex with a sex worker in the last 12 months	11 (2.6)	410 (97.4)

Table 4. Attitude towards HIV prevention and transmission

Question	Yes (Frequency (%))	No (Frequency (%))
Perception of risk being infected with HIV	0	421 (100)
Currently receiving ARV treatment	46 (10.9)	375 (89.1)
Permanent partner/spouse took HIV testing	53 (12.6)	368 (87.4)
Ever had HIV test to determine infection status	79 (18.8)	342 (81.2)
Knows where to go for HIV testing	325 (77.2)	96 (22.8)

Table 5. Association between sociodemographic factors and aspects of HIV KAP

Variable	Knowledge		Practice		Attitude	
	χ^2	df	χ^2	df	χ^2	df
Education level	410.35	6*	48.737	3*	6.989	3*
Employment status	135.68	4*	47.727	2*	10.73	2*
Average income	165.55	8*	117.94	4*	64.22	4*

*Indicates p-value <0.01

The study encompassed 421 participants and scrutinized the objectives alongside corresponding hypotheses. Concerning the link between sociodemographic factors and HIV prevention and knowledge, data indicate a predominant proportion of individuals (71%) showcasing good knowledge on HIV prevention and transmission, while 25% had poor knowledge, and a minor segment (4%) had moderate knowledge. Predominantly, those with tertiary education manifested a significant understanding of HIV prevention and transmission, underscoring education's pivotal role in fostering safe practices. Education equips individuals with critical awareness and values, arming them against potential risks associated with sexual behavior. This outcome is consistent with the findings of various international studies [19], [20]. It is advocated that sexual education begins early, in primary education, to adequately prepare students for adulthood [21]. Additionally, it was observed that participants married to women and those from diverse job backgrounds possessed substantial knowledge, with those high earning notably well-informed on HIV prevention and transmission. This aligns with Nattrass's study, which emphasizes a strong correlation between high income and the incidence of communicable diseases [22]. According to Lagarde *et al*. as time progresses, the prevalence of HIV/AIDS begins to decrease among wealthier populations. Consequently, the distribution of the HIV/AIDS epidemic shifts toward the poorer segments of the population, who often have minimal or no education [23].

The next objectives were examined the relationship between sociodemographic factors and HIV transmission and prevention practices. Findings revealed that individuals without formal education significantly engaged in safe sex practices, such as condom use. This corresponds with findings from Zuilkowski and Jukes [24], who, in their systematic review of the literature, discovered that in 23 out of 44 studies, higher education levels were significantly linked to increased condom use among sexually active young man. However, there is a stark contrast with primary school-educated participants, who notably did not use condoms during their last sexual encounter, signifying a gap in early sexual education. Proper and comprehensive sexual health education is deemed critical to prevent risky behaviors that could lead to STIs like syphilis and [25]. The study also highlighted that higher income individuals were more likely to practice safe sex, while unemployed participants were less likely to use condoms. Furthermore, attitudes towards HIV prevention and transmission also showed a distinct pattern in relation to sociodemographic. Unmarried participants were less likely to have undergone HIV testing, often relying on informal sources like friends and social media for information on HIV, which contrasts with women's healthcare interactions during services such as antenatal care. Men's reluctance for HIV testing was often attributed to fear and ignorance, with stigma and relationship conflicts acting as additional deterrents [26]. This aversion is further exacerbated by the perception of HIV as a 'death sentence,' leading to avoidance of testing [27]. Low-income earners (<RM 500) also showed a significant tendency to forgo HIV testing, suggesting an acute awareness of risk but a concurrent avoidance of confirmation of their health status.

A lack of comprehensive knowledge is a significant risk factor for the spread of STIs, including HIV/AIDS. It is vital to provide targeted HIV-related education to students, particularly at a young age [28]. Educational institutions serve as a crucial platform for HIV intervention programs, as they offer a structured environment to engage with a large audience at a pivotal developmental stage. Additionally, non-profit organizations should persist in their efforts to support MSM communities through promoting safe sex practices and increasing access to testing and surveillance. The response to this issue must be tactful, directing resources to the poorest and unemployed segments within the MSM community [29]. However, possessing knowledge on HIV prevention is not sufficient to ensure safe sexual behaviors. The motivation and behavioral skills to engage in safe sex practices are also essential components [30]. Simply being well-informed does not guarantee that an individual will not engage in behaviors that increase the risk of infection. Hence, there is a need for a comprehensive approach that includes education, motivation, and the development of behavioral skills to foster protective sexual behavior [31].

4. CONCLUSION

The study provides a comprehensive overview of the knowledge, attitudes, and practices concerning HIV prevention and transmission among the surveyed participants. While a substantial proportion of participants displayed a sound understanding of HIV prevention and transmission, the data suggests that there is a general awareness about HIV and its mechanisms among the study population. Participants with tertiary education particularly showed a robust knowledge base regarding HIV prevention and transmission methods. Furthermore, there was unanimous agreement among participants that HIV cannot be contracted through sharing food with an infected individual. In summary, the findings indicate that sociodemographic factors play a significant role in influencing the knowledge, attitudes, and practices related to HIV transmission and prevention. These insights underscore the importance of tailored educational and prevention programs that consider the diverse backgrounds of individuals to effectively address and reduce the risk of HIV infection.

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