



Knowledge, Attitudes, Condom Use among HIV-Positive Men Who Have Sex with Men in Surakarta

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Abstract

The prevalence of Human Immunodeficiency Virus (HIV) in Indonesia continues to increase, particularly among men who have sex with men (MSM). Condom use remains a key strategy to prevent HIV transmission in this population. This study aimed to analyze factors associated with consistent condom use among HIV-positive MSM in Surakarta, Indonesia. A cross-sectional design was applied using purposive sampling, involving 34 HIV-positive MSM recruited from the community. Data were collected through a structured questionnaire assessing condom knowledge, attitudes, and use, and analyzed using univariate and bivariate analyses. The mean age was 33 years, with most participants being single (82.3%) and having completed high school to university (94.1%). While 97.1% acknowledged the importance of condoms, 67.6% had misconceptions about correct use, 29.4% perceived condoms as reducing sexual pleasure, and 35.3% reported inconvenience in purchasing or carrying condoms. Only 44.1% reported consistent condom use, and 55.9% had engaged inconsistent condom use during anal sex with male partners in past six months. Bivariate analysis showed no significant association between age, education, marital status, and employment and consistent condom use. These findings highlight the important role of cognitive and attitudinal factors in shaping condom use behavior among HIV-positive MSM, suggesting that targeted behavior change interventions that address misconceptions and sociocultural barriers are crucial for strengthening HIV prevention efforts in Indonesia.

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Introduction

Human Immunodeficiency Virus (HIV) remains a public health problem both globally and in Indonesia. Globally, as of 2024, there will be 39 million people living with HIV, with 1.3 million new infections occurring annually, with men who have sex with men (MSM) as one of the key vulnerable populations (UNAIDS, 2025). According to UNAIDS (2024), key populations account for a disproportionately high share of new HIV infections, particularly in low and middle-income countries (LMICs) such as Indonesia. In Indonesia, HIV prevalence among MSM is substantially higher than in the general population, underscoring the need for targeted prevention interventions (Kementerian Kesehatan RI, 2023). Consistent with national findings, local data from the Surakarta AIDS Commission revealed that MSM were the primary group affected by new HIV cases, underscoring the importance of focusing preventive efforts in Surakarta (KPA, 2024).

Condom use among HIV-positive MSM remains a critical component of prevention strategies. For individuals already living with HIV, consistent condom use reduces the risk of onward transmission to sexual partners, including both HIV-negative individuals and other people living with HIV. Condom use also prevents the risk of acquiring other sexually transmitted infections (STIs) that can further compromise health outcomes. Despite the availability of antiretroviral (ARV), condom use continues to play a vital role in comprehensive HIV prevention and sexual health promotion for MSM. However, its effectiveness is highly dependent on consistency and comfort of use (World Health Organization, 2022). Several studies finding a gap between knowledge, attitudes, and consistent condom use among MSM, including HIV-positive MSM.

Previous studies have highlighted that psychosocial and relational factors often play a more prominent role than knowledge alone. Burton et al. (2017), which surveyed 95 MSM newly diagnosed with HIV, reported that 65% used condoms inconsistently with HIV-positive MSM partners. Factors predicting inconsistent condom use included feelings of love or emotional closeness to the partner (OR=3.69; 95% CI=1.06-12.82). Attitudes were a stronger influence on practice than knowledge or rational risk. Dong et al. (2018) found that knowledge about HIV was high in the MSM population (OR=91.1, 95% CI=89.5-92.4) but consistent condom use practices were still low, reflecting the complexity of the hypothesis that knowledge transfer and behavior change are key to HIV prevention. Another study conducted by Safika et al. (2014) showed that although most MSM in Indonesia understand the role of condoms in HIV prevention, condom use among MSM and transgender women remains low. This is influenced by several factors, including social norms, perceived reduced sexual pleasure, and negotiation with partners. A study with similar results by Wei et al. (2011) in China showed that inconsistent condom use is related to risky sexual behavior and relationships with female partners. Meanwhile, research in Ghana reported that factors influencing consistent condom use included the availability of lubricants, communication with partners, and community support (Anarfi, et al., 2023). Other research emphasized that negative attitudes toward condoms, social stigma, and partner rejection remain significant barriers (Fauk, et al., 2018). Evidence from Indonesia and other countries supports these findings. Fauk et al. (2018) in Indonesia showed that social stigma regarding purchasing or carrying condoms, limited access, and pressure from partners who refuse to use condoms are significant factors reducing condom use. Based on these observations, although condom knowledge is relatively good among HIV-positive MSM, knowledge does not guarantee consistent condom use. This remains a significant challenge. While many studies focus on HIV prevention among the general population or HIV-negative MSM, evidence specifically addressing MSM living with HIV remains limited. Understanding the knowledge, attitudes, and behaviors of this group is particularly important, as they play a central role in ongoing HIV transmission dynamics.

In Surakarta City, strong religious norms and persistent stigma against sexually active key populations, including men who have sex with men (MSM), often face challenges in the form of social barriers, such as discrimination and stigma within the community, family, and health care providers, preventing them from accessing condoms and discussing safe sex. Furthermore, discomfort in purchasing condoms, fear of discrimination in health care, and limited peer support networks contribute to inconsistent condom use.

In response to this gap, this study aims not only to describe the knowledge, attitudes, and condom use behaviors among HIV-positive MSM in Surakarta but also to identify contextual barriers that may hinder consistent condom use. The findings of this study are expected to inform community-based interventions that are sensitive to local and cultural contexts and align with policies supporting Indonesia's National HIV and AIDS Strategy and Action Plan (2021–2026) and the Kemenkes RI HIV Prevention Guidelines 2022, which emphasize stigma reduction and empowerment of key populations through community-based approaches.



Methods

This study used a cross-sectional design to describe the knowledge, attitudes, and condom use behaviors of HIV-positive men who have sex with men (MSM). A total of 34 HIV-positive MSM were recruited through purposive sampling from a network of HIV-positive MSM actively involved with community-based organizations in Surakarta during the study period. Inclusion criteria were: self-identified as MSM, diagnosed HIV-positive, and aged 18 years or older. Exclusion criteria included individuals unwilling or unable to complete the questionnaire independently. Data were collected through a self-reported online questionnaire via kobotoolbox, guided by trained enumerators.

The questionnaire was adapted from validated international instruments previously used in MSM behavioral surveillance studies, such as the Integrated Biological and Behavioral Survey (IBBS). Knowledge was assessed using three items related to condom effectiveness and consistency, attitudes were measured using three Likert-type questions, and condom use practices were assessed based on self-reported consistency during anal sex with a male partner in the past six months. Content validity was reviewed by HIV program experts, including respondent characteristics (age, marital status, education level, and occupation) and variables related to knowledge, attitudes, and behavior regarding condom use for HIV prevention. Before completing the questionnaire, respondents were explained the study's purpose, data confidentiality, and the right to refuse or discontinue participation at any time.

All respondents provided written informed consent. Data analysis used univariate methods to describe respondents' characteristics, knowledge, attitudes, and behavior. In addition, bivariate analysis was conducted to examine the relationship between respondent characteristics and consistency of condom use. This study has been declared ethical by the Research Ethics Committee of the Faculty of Medicine, Sebelas Maret University, based on Decree No. 68/UN27.06.11/KEP/EC/2025. All research procedures adhered to ethical principles of health research, including maintaining the confidentiality of respondents' identities and respecting participants' rights.

Results

Table 1. The distribution of Respondents based on Characteristics (n=34)

Characteristics	f	%
Age		
- < 33 years	21	64.7
- ≥ 33 years	13	35.3
Marital status		
- Single	28	82.3
- Married	6	17.6
Education		
- Elementary-Middle School	2	5.8
- High School-University	32	94.1
Employment		
- Not working	8	23.5
- Working	26	76.5

Table 1 shows the distribution of respondents based on characteristics among 34 HIV-positive men who have sex with men. The majority were aged <33 years (64.7%), most were single (82.3%), had a high school-university (94.1%), and working (76.5%).

Table 2. Distribution of Respondents Knowledge (n=34)

Variable	f	%
Knowledge of importance using condoms to prevent HIV transmission		
- False	1	2.9
- True	33	97.1



Variable	f	%
Knowledge of consistency condom use in preventing HIV transmission		
- False	23	67.6
- True	11	32.4
Knowledge of effectivity condom use in reducing the risk of HIV transmission		
- False	0	0.0
- True	34	100

Table 2 shows the distribution of respondents' knowledge among 34 HIV-Positive men who have sex with men. Most respondents answered correctly regarding the importance of using condoms to prevent HIV transmission (97.1%). However, only a small number of respondents answered correctly regarding the consistency condom use in preventing HIV transmission (32.4%) and most had misconceptions about correct use (67.6%). All respondents answered correctly regarding the effectiveness of condom use (100%).

Table 3. Distribution of Respondents Attitudes (n=34)

Variable	f	%
Perceived condoms as reducing sexual pleasure		
- Disagree	24	70.6
- Agree	10	29.4
Discomfort in purchasing or carrying condoms		
- Disagree	22	64.7
- Agree	12	35.3
Condoms are an important HIV prevention tool		
- Disagree	1	2.9
- Agree	33	97.1

Table 3 shows the distribution of respondents' attitudes from a sample of 34 HIV-Positive men who have sex with men. Some respondents agreed that they were reluctant to use condoms because it reduced sexual pleasure (29.4%), some agreed that they felt uncomfortable purchasing or carrying condoms (35.3%), and the majority of respondents agreed that condoms were an important HIV prevention tool (97.1%).

Table 4. Distribution of Respondents Condom Use (n=34)

Variable	f	%
Consistent condom use		
- Consistent (Always)	15	44.1
- Inconsistent (sometimes/never)	19	55.9
Had anal sex without a condom in the last 6 months		
- Yes	17	50.0
- No	14	41.2
- Do not remember	3	8.8
If yes, the reason for not using a condom is because the partner refuses		



Variable	f	%
- Yes	8	47.1
- No	9	52.3
If yes, the reason for not using a condom is because they forgot		
- Yes	7	41.2
- No	10	58.8
If yes, embarrassed to buy condoms		
- Yes	2	11.8
- No	15	88.2

Table 4 shows the distribution of condom use behavior among 34 HIV-positive men who have sex with men. Some reported consistent/always using condoms during anal sex (44.1%), while 55.9% reported inconsistent condom use, who used condoms sometimes (47.1%) and never (8.8%). These included those who reported not using condoms because their partner refused (47.1%), those who forgot (41.2%), and those who were embarrassed to buy condoms (11.8%).

Table 5. Relationship Between Characteristics Respondents and Consistency of Condom Use

Respondents Characteristics	Condom Use						p-value
	Inconsistent (Sometimes/Never)		Consistent (Always)		Total		
	N	%	N	%	N	%	
Age							0.484
< 33 years	13	61.9	8	38.1	21	100	
≥ 33 years	6	46.2	7	53.8	13	100	
Marital Status							0.370
Single	17	60.7	11	39.3	28	100	
Married	2	33.3	4	66.7	6	100	
Education							0.187
Elementary-Middle School	0	0.0	2	100	2	100	
High School-University	19	59.4	13	40.6	32	100	
Employment							1.000
Not Working	4	50.0	4	50.0	8	100	
Working	15	57.7	11	42.3	26	100	

p-value: Fisher's exact test

Table 5 shows the relationship between respondent characteristics and consistent condom use. Of the 21 respondents aged <33 years, the majority reported inconsistent condom use during anal sex with male partners (61.9%). Meanwhile, of the 13 respondents aged ≥33 years, the majority reported consistent condom use (53.8%). The p-value = 0.484 (p>0.05), indicating no significant relationship between age and consistent condom use.

Of the 28 unmarried respondents, the majority reported inconsistent condom use during anal sex with male partners (60.7%), while the majority of the six married respondents reported consistent condom use (66.7%). The p-value = 0.370 (p>0.05), indicating no significant relationship between marital status and consistent condom use.

Furthermore, of the two respondents with elementary to middle school education, all reported consistent condom use (100%). Of the 32 respondents with high school to university education, the majority reported inconsistent condom use during anal sex with male partners (59.4%). The p-value = 0.187 (p>0.05), therefore, it can be concluded that there is no significant relationship between education and consistent condom use.

Meanwhile, the eight unemployed respondents showed no difference in condom use consistency. The majority of the 26 employed respondents reported consistent condom use (57.7%). The p-value = 1.000 (p>0.05), therefore, it can be concluded that there is no significant relationship between employment and consistent condom use.



Discussion

Knowledge

The majority of respondents (97.1%) acknowledged the importance of condoms as a means of HIV prevention, indicating a relatively high level of awareness. However, only a small number of respondents (32.4%) understood that condoms must be used consistently during every sexual encounter to be effective, while the majority (67.6%) had little understanding of this. This finding indicates a knowledge gap regarding the consistency of condom use among the study participants. This study is similar to that of Jin et al. (2013), which showed that although MSM had a high average knowledge of HIV, their knowledge regarding the consistency of condom use was low, impacting consistency in condom use. Meanwhile, all respondents were 100% aware that condom use is effective in preventing HIV transmission. This indicates a universal understanding that condoms are an effective prevention method. In general, respondents' knowledge level regarding the importance of condom use was good. However, there was still a knowledge gap regarding the consistency of condom use, with many respondents not realizing that condoms must be used during every sexual encounter to prevent HIV transmission. This finding is important because consistency is a key factor in the effectiveness of condoms as a means of HIV prevention. A similar study among MSM in China showed that despite generally high levels of HIV knowledge, consistent condom use remains a challenge. Even with proven knowledge, consistent condom use was significantly associated with consistent condom use (OR = 4.08) (Jin et al., 2013). Another study in Ghana reported that good HIV knowledge was associated with consistent condom use among MSM (Abdulai et al., 2025).

Based on the Information-Motivation-Behavior (IMB) Skills model (Fisher, 1992), knowledge is only one component influencing disease prevention behavior. Without supporting motivation (e.g., risk perception, communication with partners, health care provider/community support) and behavioral skills (e.g., condom negotiation, condom access), high knowledge alone does not impact consistent condom use (Hidayat et al., 2022). Furthermore, in the Indonesian context, particularly in Surakarta, social and cultural barriers such as stigma against MSM remain entrenched. Furthermore, religious objections to same-sex relationships and discrimination in health services can hinder the translation of knowledge into consistent behavior. Local studies show that stigma in health facilities and peer pressure in social networks reduce condom use despite good awareness (Ministry of Health of the Republic of Indonesia, 2021).

These findings have important implications for HIV prevention programs directly support Indonesia's National HIV and AIDS Strategy and Action Plan 2021–2026. Educational interventions targeting sexually active HIV-positive men should not only provide knowledge about the importance of condom use but also highlight the risks of inconsistent use, including onward transmission, HIV superinfection, and transmission of other STIs. Tailored counseling during ART services. Therefore, peer-led education and community-based initiatives can contribute to addressing this knowledge gap and strengthening consistent condom use practices.

Attitudes

Most respondents expressed positive attitudes toward condom use, with 70.6% disagreeing that condoms reduce sexual pleasure. However, nearly a third (29.4%) still perceived condoms as reducing sexual satisfaction, indicating persistent psychological and cultural barriers (Calabrese et al., 2019). This perception is consistent with global research showing that reduced sexual pleasure remains one of the strongest barriers to consistent condom use among MSM and sex workers (Crosby et al., 2013). From a behavioral perspective, based on the Information-Motivation-Behavior (IMB) Skills model and the Theory of Planned Behavior (TPB), attitudes play a significant role in shaping preventive behavior. Even when individuals have adequate knowledge, negative affective beliefs, such as condoms reducing intimacy or pleasure, can weaken motivation to use them consistently (Fisher, 1992).

Regarding accessibility, the majority of respondents (64.7%) felt comfortable purchasing and carrying condoms, but 35.3% still reported experiencing discomfort. This is a social barrier related to cultural norms, social stigma, and negative perceptions of individuals accessing condoms. Research in Southeast Asia indicates that social stigma and fear of judgment from others are often perceived as preventing key populations from obtaining condoms from health services (Fauk et al., 2018). Furthermore, almost all respondents (97.1%) agreed that condoms are an important tool in HIV prevention, with a small proportion (2.9%) disagreeing. This indicates a well-established awareness of the role of condoms in HIV prevention. Previous research also confirms that understanding condom effectiveness in preventing HIV and other sexually transmitted infections is positively correlated with consistent condom use (Pinyaphong et al., 2017). These findings suggest that, within this study population positive attitudes toward condoms persist, there are barriers that may impact practice, particularly related to attitudes toward sexual pleasure and the discomfort of purchasing and carrying condoms. Therefore, HIV prevention interventions should



not only emphasize increasing knowledge but also include community-based approaches to stigma reduction and normalizing condom use (WHO, 2022).

This finding aligns with the National HIV Strategy 2021–2026, which explicitly emphasizes stigma reduction, social norm change, and the creation of supportive environments for key populations through community-based interventions

Condom Use

The results of this study indicate that condom use among respondents remains inconsistent. Only 44.1% of respondents reported always using condoms, while the majority reported using condoms only occasionally (47.1%) or never (8.8%). This finding is reinforced by the respondents' admission that in the past six months, 50% of respondents admitted to having had inconsistent condom use during anal sex with male partners. This is in line with research in Indonesia by Safika et al. (2014), which found that although respondents' knowledge about condoms was relatively good, consistent condom use remained low, primarily influenced by factors such as relationships with partners, social norms, and perceptions of sexual pleasure.

The main reasons respondents in this study for not using condoms were partner rejection (47.1%) and forgetfulness (41.2%), while embarrassment about purchasing condoms (11.8%) was cited. This is in line with a study in China, which found that one of the main barriers to consistent condom use was individuals' poor ability to negotiate condom use with their partners, as well as discomfort or negative perceptions about condom use. Furthermore, interpersonal factors, such as one partner being more dominant in a sexual relationship, also play a significant role. Research in Ghana reported that partner rejection was one of the most dominant reasons why MSM did not use condoms consistently (Anarfi et al., 2023). Consistent with this research, a study of HIV-positive MSM in New York showed that despite respondents' knowledge of the importance of condom use, 65% still reported inconsistent use with their HIV-positive partners. This was influenced by emotional factors such as love and trust in their partners (Burton et al., 2017). In Indonesia, qualitative research among HIV-positive MSM emphasized that social capital and community support play a significant role in encouraging condom use, but stigma and fear of discrimination remain major barriers (Safika et al., 2014).

These findings suggest that in similar CBO's settings, interventions should not only emphasize increasing knowledge about the benefits of condoms but also include empowering individuals in communication skills, negotiating condom use, and addressing psychosocial barriers such as shame, stigma, or perceived decreased pleasure. Therefore, HIV prevention strategies for key populations need to consider a more comprehensive approach, such as partner support, community-based interventions, and providing easy access to condoms. This aligns with the 2022 Indonesian Ministry of Health HIV Prevention Guidelines, which emphasize behavior change communication, community engagement, and equitable access to prevention tools such as condoms and PrEP. Strengthening this policy direction through peer-to-peer programs, collaboration with community-based organizations, and stigma reduction campaigns in healthcare settings is crucial to bridge the gap between knowledge, attitudes, and consistent prevention behaviors among key populations in Indonesia (Indonesian Ministry of Health, 2022).

Relationship Between Characteristics Respondents and Consistency of Condom Use

Bivariate analysis showed that none of the sociodemographic variables, including age, marital status, education, and occupation, showed a statistically significant association with consistent condom use among HIV-positive MSM in Surakarta ($p > 0.05$). In this study, younger respondents (<33 years) showed a higher of inconsistent condom use during anal sex with male partners (61.9%) compared to older respondents (≥ 33 years) who reported consistent use (53.8%). An observed trend suggests that younger MSM may experience greater challenges to maintaining consistent protective behaviors, which may related factors such as perceived vulnerability, sexual decision-making processes, or peer norms, as suggested in previous studies. Similar findings were reported by Wang et al. (2020) and Adeyemi et al. (2021), who found that younger age groups were less consistent in condom use due to reduced confidence in negotiating and limited peer education on prevention.

Marital status also influenced the likelihood of consistent condom use. A larger proportion of single MSM reported inconsistent condom use during anal sex with male partners (60.7%), compared to married MSM who tended to use condoms more consistently (66.7%). This pattern reflects the emotional intimacy and trust felt in marital or long-term relationships, which leads to condom use as part of mutual protection, especially when both partners are HIV-positive. However, for single MSM, relationships with temporary partners, casual encounters, and the influence of stigma can reduce motivation for consistent use, as found by Pungkasanti et al. (2022) in Jakarta and Anarfi et al. (2023) in Ghana.

Education did not show a statistically significant association ($p = 0.187$). The majority of MSM with a higher education (high school to university) reported inconsistent condom use during anal sex with male partners (59.4%), while MSM with an elementary to middle school education all reported consistent



condom use (100%). This difference may indicate that knowledge alone is not enough to drive consistent behavior, in line with the Information-Motivation-Behavior (IMB) Skills model (Fisher & Fisher, 1992), which emphasizes that behavioral skills and motivation must accompany knowledge to translate awareness into action. Highly educated MSM may be aware of HIV risks but are still influenced by affective or contextual barriers such as perceived pleasure or stigma during condom purchase.

Employment status also showed no significant difference ($p=1.000$). However, those who were unemployed had slightly higher rates of consistent condom use (50%) compared to employed respondents (42.3%). This may be attributed to lifestyle factors, as employed MSM potentially have more income and social exposure, thus increasing sexual network size and risk-taking behavior, as observed in a study from Thailand (Phanuphak et al., 2019).

These findings highlight that consistent condom use among HIV-positive MSM in Surakarta is not solely shaped by sociodemographic factors, but also by social and cultural contexts including stigma against MSM in healthcare settings, religious norms that inhibit open discussions about sexuality, and limited access to condoms in judgment-free spaces. This supports the National HIV Strategy 2021–2026, which emphasizes addressing structural and social determinants such as stigma, service accessibility, and community empowerment rather than relying solely on demographic targeting.

Conclusion

This study highlights gaps in knowledge, attitudes, and consistent condom use among HIV-positive men who have sex with men (MSM) in Surakarta. Despite high awareness of condom effectiveness, consistent use remains suboptimal due to interpersonal, psychosocial, and structural barriers. These findings underscore the importance of integrated HIV prevention strategies that go beyond information provision, emphasizing peer-led interventions, stigma reduction, and increased condom access through community-based approaches. Strengthening these efforts supports the National HIV and AIDS Strategy and Action Plan 2021–2026 and is crucial to supporting Indonesia's goal of reducing new HIV infections through a combination prevention strategy (condoms, PrEP, and HIV testing) through collaboration between community organizations, health facilities, and local health offices.

Limitations

Although the small sample size and use of purposive sampling limit the generalizability of the findings, this study provides important contextual insights into condom use behaviors among HIV-positive MSM engaged in community-based services. These findings can inform the development of targeted, stigma-sensitive interventions. Future studies should include larger samples to strengthen external validity and explore broader behavioral and structural determinants of condom use, such as stigma, experiences in healthcare settings, peer support, and engagement in HIV prevention programs. Incorporating these variables could improve the design and effectiveness of community-based HIV prevention interventions.

Author Contributions

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Institutional Review Board Statement

This study has received ethical approval from the Research Ethics Committee of Faculty Medicine, Universitas Sebelas Maret, with approval number No. 68/UN27.06.11/KEP/EC/2025.



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Conflicts of Interest:

The authors declare no conflict of interest.

References

- Abdulai, R., Phalane, E., Atuahene, K., Kwao, I. D., Afriyie, R., Shiferaw, Y. A., & Phaswana-Mafuya, R. N. (2025). Consistency of Condom Use with Lubricants and Associated Factors Among Men Who Have Sex with Men in Ghana: Evidence from Integrated Bio-Behavioral Surveillance Survey. *International Journal of Environmental Research and Public Health*, 22(4), 1–23. <https://doi.org/10.3390/ijerph22040599>
- Anarfi J, Amo-Adjei J, L. A. (2023). Factors associated with consistent condom use with lubricants among men who have sex with men in Ghana: Findings from the 2017 Ghana Men's Study. *BMC Public Health*, 23(180). <https://doi.org/10.1186/s12889-023-15089-9>
- Burton, N.T, Misra, K., Bocour, A., Shah, S., Gutierrez, R., Udeagu, C. . (2017). Inconsistent condom use with known HIV-positive partners among newly diagnosed HIV-positive men who have sex with men interviewed for partner services in New York City, 2014. *Sexually Transmitted Infections*, 95(2), 108–114. <https://doi.org/https://doi.org/10.1136/sextrans-2017-053479>
- Calabrese, S. K., et al. (2019). *Pleasure and prevention: Integrating sexual satisfaction in condom promotion among MSM*. *AIDS and Behavior*, 23(1), 37–49.
- Crosby, R. A., Milhausen, R. R., Yarber, W. L., Sanders, S. A., & Graham, C. A. (2013). Condom Use Errors and Problems: A Global View. *Sexual Health*, 10(5), 455–460. <https://doi.org/https://doi.org/10.1071/SH13038>
- Dong, M.-J., Peng, B., Liu, Z.-F., Wang, C.-Q., Liu, H., Lu, X.-L., Zhang, B., Zhu, Y., & Chen, J.-J. (2018). WITHDRAWN: The prevalence of HIV among MSM in China: a large-scale systematic review and meta-analysis. *Oncotarget*, 0(0), 1–20. <https://doi.org/10.18632/oncotarget.24101>
- Fauk, N. K., Sukmawati, A. S., & Mwanri, L. (2018). Stigma and Discrimination towards People Living with HIV in Indonesia: A Narrative Review. *International Journal of Environmental Research and Public Health*, 15(4), 707. <https://doi.org/https://doi.org/10.3390/ijerph15040707>
- Fisher, J. D., & Fisher, W. A. (1992). *Changing AIDS-risk behavior*. *Psychological Bulletin*, 111(3), 455–474.
- Hidayat, R., Wulandari, L., & Raharjo, B. B. (2022). *Barriers to condom use among MSM in Central Java, Indonesia*. *Global Health Action*, 15(1), 2105634.
- Jin, M., Yang, Z., Dong, Z., & Han, J. (2013). Correlates of consistent condom use among men who have sex with men recruited through the Internet in Huzhou city: A cross-sectional survey. *BMC Public Health*, 13(1). <https://doi.org/10.1186/1471-2458-13-1101>
- Kemenkes RI. (2021). *Strategi Nasional Penanggulangan HIV dan AIDS 2020–2024*. Jakarta: Kemenkes RI.
- Kemenkes RI. (2022). *Peraturan Menteri Kesehatan Republik Indonesia Nomor 23 Tahun 2022 tentang Penanggulangan HIV, AIDS, dan Infeksi Menular Seksual (IMS)*. Jakarta: Kementerian Kesehatan Republik Indonesia.
- Kemenkes RI. (2023). *Petunjuk Teknis Tatalaksana Program Profilaksis Pra-Pajanan (PrEP) Oral untuk Orang Berisiko Tinggi Terinfeksi HIV di Indonesia*.
- Logie, C. H., Wang, Y., Marcus, N., & Kaida, A. (2021). *HIV prevention and stigma reduction among key populations in Southeast Asia: A multi-country analysis*. *AIDS Care*, 33(8), 1024–1032.
- Phanuphak, N., Anand, T., & Jantarapakde, J. (2019). *Demographic correlates of condom use among MSM in Thailand*. *AIDS and Behavior*, 23, 2492–2504.
- Pinyaphong, J., Visarutratana, S., & Peltzer, K. (2017). Factors Associated with Condom Use among Men Who Have Sex with Men in Thailand. *AIDS Care*, 29(8), 986–992. <https://doi.org/https://doi.org/10.1080/09540121.2016.1274017>
- Safika I, Johnson TP, C. Y. (2014). Condom Use Among Men Who Have Sex With Men and Male-to-Female Transgenders in Indonesia. *AIDS Educ Prev*, 26(5), 436–448. <https://doi.org/10.1521/aeap.2014.26.5.436>
- UNAIDS. (2024). *Global HIV & AIDS statistics — Fact sheet*. <https://www.unaids.org/en/resources/fact-sheet>
- UNAIDS. (2025). *Status of HIV Programmes in Indonesia*. https://www.unaids.org/en/resources/presscentre/featurestories/2025/february/20250224_indonesia_fs



- Wei, C., Guadamuz, T. E., Stall, R., & Wong, F. Y. (2011). STD prevalence, risky sexual behaviors, and sex with women in a national sample of MSM in mainland China. *AIDS and Behavior*, 15(3), 546–556. <https://doi.org/https://doi.org/10.1007/s10461-010-9790-8>
- WHO. *World Health Statistics Monitoring Health of The SDGs, Sustainable Development Goals*. Geneva; 2022. (2022).
- World Health Organization (WHO). (2022). *Consolidated Guidelines on HIV Prevention, Testing, Treatment, Service Delivery and Monitoring*.

