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Original Article

HIV Prevention Knowledge, Attitudes, and Practices Among Young Men Who Have Sex with Men in Mahasarakham Province, Northeastern Thailand: A Cross-Sectional Study

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Keywords: HIV prevention, young men who have sex with men, knowledge, attitudes, preventive practices

Running title: HIV Prevention Knowledge, Attitudes, and Practices Among YMSM in Mahasarakham, Thailand

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Abstract

Objectives: This study assessed HIV prevention knowledge, attitudes, and preventive practices among YMSM in Mahasarakham Province and identified the factors associated with preventive behaviors.

Materials and Methods: A cross-sectional survey was conducted between March 2023 and December 2024. A simple random sampling technique was employed to recruit 650 YMSM in Mahasarakham Province. Data were collected using a validated self-administered questionnaire. Descriptive statistics, chi-square tests, and multivariate binary logistic regression analyses were performed.

Results: The mean age of participants was 21.52 years. Overall, 52.31% reported a moderate level of HIV preventive practices, 33.85% a high level, and 13.85% a low level. Multivariate analysis revealed that age, education, HIV testing history, STI screening, HIV-related knowledge, and attitudes were significantly associated with preventive practices. Participants with high HIV-related knowledge were 4.45 times more likely to engage in preventive behaviors ($p = 0.005$), and those with positive attitudes were 2.54 times more likely to practice prevention ($p = 0.016$).

Conclusion: HIV preventive practices among YMSM remain suboptimal and are influenced by socio-demographic factors, health-service utilization, knowledge, and attitudes. Targeted, youth-friendly, and culturally sensitive interventions are urgently needed.

Keywords: HIV prevention, young men who have sex with men, knowledge, attitudes, preventive practices

Introduction

Thailand, in collaboration with the World Health Organization (WHO), has adopted a national strategy to end AIDS as a public health threat by 2030,[1] aiming to reduce new HIV infections to fewer than 1,000 cases annually and HIV-related deaths to fewer than 4,000 per year. Despite substantial progress in HIV prevention and treatment, HIV/AIDS remains a major global health challenge and continues to disproportionately affect key populations, particularly men who have sex with men (MSM).[2] In Asia, HIV prevalence among MSM has shown a persistent upward trend, with Thailand reporting especially high rates in urban settings such as Bangkok.[3] National surveillance data indicate that HIV prevalence remains alarmingly high among young MSM

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(YMSM), particularly those under 25 years of age. Local evidence from Mahasarakham Province further highlights the vulnerability of this group, with a substantial proportion of newly diagnosed HIV cases occurring among YMSM.[4,6] Behavioral and structural factors, including inconsistent condom use, low uptake of pre-exposure prophylaxis (PrEP), infrequent HIV and STI testing, substance use during sexual activity, limited access to accurate sexual health information, and sociocultural barriers, contribute to ongoing transmission.[5,6]

Objective

This study explored HIV prevention knowledge, attitudes, and preventive practices among young men who have sex with men in Mahasarakham Province. The findings are expected to contribute to evidence-based planning and implementation of targeted HIV prevention strategies, enhance awareness among healthcare providers, and support national efforts toward achieving the goal of ending AIDS by 2030.

Materials and Methods

Study Design and Study Site

This study employed a cross-sectional survey design using a self-administered questionnaire. The research was conducted among young men who have sex with men (YMSM) and individuals affiliated with government sector groups in Mahasarakham Province, Thailand. Data collection was carried out over a period from March 2023 to December 2024.

Participants and Data Collection

The initial sample size was calculated based on a total population of 1,560 individuals, with a 95% confidence level and a variance value of 0.82, following the formula proposed by Mayuree and Pannee.[7] The required minimum sample size was estimated at 540 participants. To compensate for potential non-response due to the sensitivity of the research topic, an additional 10% was added, resulting in a final target sample size of 650 participants.

A sampling frame of 1,560 YMSM individuals was obtained. From this list, 850 names were randomly selected using simple random sampling to ensure proportional representation. Data collection was carried out from March 2023 to December 2024.

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Prior to data collection, the researcher provided a detailed explanation of the study objectives, procedures, participants' rights, and confidentiality assurances. Written informed consent was obtained from all participants. For participants under the age of 18, consent was obtained from their parents or legal guardians. Data were collected using a self-administered questionnaire, which participants completed individually during a scheduled break period. Completed questionnaires were returned to the research team the following day. Participants who declined to provide consent were excluded from the study.

Data Collection Instrument

The self-administered questionnaire consisted of four sections:

Part 1: Demographic and background information, including age, education, occupation, income, HIV testing history, and sexual behaviours.

Part 2: Knowledge of HIV prevention (16 items), covering modes of transmission, symptoms, treatment, and prevention.

Part 3: Attitudes toward HIV prevention (15 items).

Part 4: Preventive practices related to HIV/AIDS over the past six months.

Content validity of the questionnaire was evaluated by experts, yielding a content validity index of 0.91. Reliability testing from a pilot study showed satisfactory internal consistency, with Cronbach's alpha coefficients of 0.86 for the attitude scale and 0.89 for the preventive practice scale.

Data Analysis

Descriptive statistics, including means, standard deviations, medians, ranges, frequencies, and percentages, were used to summarize participant characteristics and key variables. Associations between preventive practices and independent variables were initially examined using Chi-square tests. Fisher's exact test was applied when more than 20% of cells had expected frequencies below five.

Variables with a p-value less than 0.20 in bivariate analysis were entered into a multivariate binary logistic regression model to identify factors independently associated with HIV preventive practices. Statistical significance was set at $p < 0.05$.

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Ethical Approval

This study was approved by the Ethics Committee of Mahasarakham University (Approval No. 287-071/2023). Written informed consent was obtained from all the participants. The consent process emphasized confidentiality, voluntary participation, the right to withdraw at any time, and assurance that collected data would be used solely for research purposes and reported anonymously.

Results

A total of 650 YMSM were included in the analysis. The mean age was 21.52 years, and 56.92% had completed a university degree (Table 1). Only 55.38% had previously undergone HIV testing, and while 70.77% reported condom use, PrEP uptake remained low at 4.62% (Table 1). Regarding HIV preventive practices, 52.31% demonstrated a moderate level, while only 33.85% reported a high level (Table 2). Multivariate analysis showed that participants aged under 20 ($p = 0.006$), those with primary education ($p = 0.017$), and those never tested for HIV ($p = 0.041$) were significantly less likely to engage in preventive behaviors (Table 3). Furthermore, high knowledge (OR = 4.45) and positive attitudes (OR = 2.54) were strong predictors of prevention (Tables 4, 5).

Discussion

This study examined HIV prevention knowledge, attitudes, and preventive practices among young men who have sex with men (YMSM) in Mahasarakham Province. The findings provide important insights into behavioral patterns and determinants of HIV prevention in a population that remains disproportionately affected by the epidemic in Thailand.

The socio-demographic profile of the respondents reflects a predominantly young and educated population, with more than half of the participants aged between 20 and 22 years and over half having completed university education. Despite this relatively high educational attainment, only one-third of the respondents demonstrated a high level of HIV preventive practices, while more than half reported only moderate levels of prevention. This suggests that formal education alone may not be sufficient to ensure optimal HIV prevention behaviors and highlights the need for targeted sexual health education that is tailored specifically to the needs of YMSM.

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The present study found that age was significantly associated with HIV preventive practices, with respondents under 20 years of age being less likely to engage in preventive behaviors compared with those aged over 23 years.[12,13,14] This finding is consistent with previous research indicating that younger MSM often exhibit higher risk-taking behaviors due to limited life experience, lower risk perception, and reduced access to sexual health services. Younger YMSM may also face greater barriers in accessing HIV prevention information and services because of stigma, fear of disclosure, and limited autonomy in seeking healthcare.

Education level was also found to be a significant determinant of preventive practices. Participants with lower educational attainment were less likely to engage in HIV prevention behaviors than those with a university education. This finding underscores the importance of health literacy in shaping preventive behaviors.[15,16] Individuals with higher education may have better access to health information, greater awareness of HIV transmission routes, and a stronger understanding of the benefits of consistent condom use, regular HIV testing, and other prevention strategies such as pre-exposure prophylaxis (PrEP).

A history of HIV testing was strongly associated with preventive practices. Respondents who had never been tested for HIV were significantly less likely to engage in prevention behaviors. HIV testing not only serves as an entry point to early diagnosis and treatment but also provides an opportunity for counseling and education, which may enhance risk awareness and motivate individuals to adopt safer sexual practices. This finding supports the integration of routine HIV testing into youth-friendly and MSM-friendly healthcare services.[17,18]

Similarly, respondents who had not received a sexually transmitted infection (STI) check-up in the past 12 months were less likely to practice HIV prevention. Regular STI screening may reinforce awareness of sexual health risks and encourage individuals to maintain protective behaviors. These findings emphasize the importance of strengthening integrated sexual health services that provide both HIV and STI testing, counseling, and prevention support for YMSM.[19,20,25]

Knowledge was identified as a strong predictor of HIV preventive practices. Participants with a high level of HIV-related knowledge were more than four times more likely to engage in preventive behaviors than those with low knowledge. This highlights the critical role of accurate and comprehensive HIV education in promoting safer sexual practices. Many YMSM, particularly

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those from rural or conservative backgrounds, may have limited exposure to appropriate sexual health information, which may increase vulnerability to misinformation and risky behaviors.[21,22] Attitude toward HIV prevention was also significantly associated with preventive practices. Respondents with positive attitudes were more than twice as likely to engage in prevention behaviors compared with those with negative attitudes.[23,24] This finding suggests that beyond knowledge, individuals' beliefs, perceptions, and motivations play key roles in shaping health behavior. Interventions that focus on building positive attitudes toward condom use, HIV testing, and PrEP uptake may therefore be particularly effective in this population.

Overall, the findings of this study indicate that HIV prevention among YMSM is influenced by a complex interplay of socio-demographic factors, health-service utilization, knowledge, and attitudes. Although awareness of HIV may be relatively high, gaps remain in translating knowledge into consistent preventive practices. Tailored, youth-friendly, and culturally sensitive interventions are urgently needed to address these gaps.[24,25]

Strengthening school- and community-based sexual health education, expanding access to HIV and STI testing, and promoting positive attitudes toward HIV prevention strategies, such as condom use and PrEP, could substantially improve preventive behaviors among YMSM.[26,27,28] In addition, healthcare providers should be trained to deliver non-judgmental and inclusive services to ensure that YMSM feel safe and supported when seeking sexual health care.

These findings contribute valuable evidence that can inform the design of targeted HIV prevention programs and support Thailand's national goal of ending AIDS as a public health threat by 2030.

Strengths and Limitations

Strengths: This study has a large sample size and used probability-based sampling, providing robust evidence from an underrepresented region in Northeastern Thailand. Limitations: The cross-sectional design limits causal inference, and self-reported data may be subject to social desirability bias. The single-province setting may restrict generalizability, and structural factors like healthcare accessibility were not directly assessed.

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Recommendation

Based on the findings of this study, several evidence-based recommendations are proposed to strengthen HIV prevention among YMSM in Thailand**.** First, comprehensive and targeted sexual health education programs should be developed for YMSM, particularly those under **20** years of age and with lower educational attainment**.** These programs should emphasize accurate HIV knowledge, consistent condom use, routine HIV and STI testing, and the role of pre-exposure prophylaxis **(**PrEP**).** Second, access to youth-friendly and MSM-friendly healthcare services should be expanded through the provision of confidential, non-discriminatory, and culturally sensitive care**.** Integrated service delivery models that combine HIV testing, STI screening, counseling, and PrEP within a single platform may enhance service uptake and continuity of care**.** Third, routine HIV and STI testing should be actively promoted through community outreach, mobile clinics, and digital health platforms to facilitate early engagement and sustained preventive behaviors**.** Fourth, behavioral and peer-led interventions should be strengthened to foster positive attitudes, reduce stigma, and promote supportive social norms related to HIV prevention**.** Finally, digital health technologies should be leveraged to disseminate prevention information, promote testing, and support adherence to prevention strategies**.**

At the policy level, national HIV prevention strategies should prioritize YMSM as a key population and support integrated sexual health services, inclusive sexuality education, and scalable digital interventions**.** Sustained political commitment and investment are essential to achieving Thailand**'**s goal of ending AIDS by 2030.

Limitations of the study

Limitations: The cross-sectional design limits causal inference, and reliance on self-reported data may introduce recall and social desirability bias. The single-province setting may restrict generalizability, and some subgroups were relatively small. Structural factors such as stigma and healthcare accessibility were not directly assessed.

Relevance of the study

This study provides new evidence on HIV prevention knowledge, attitudes, and practices among YMSM in Northeastern Thailand, an underrepresented setting in HIV research**.** It highlights a persistent gap between HIV-related knowledge and actual preventive behaviors, as well as

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identifying the key socio-demographic and behavioral determinants, supporting the need for targeted, youth-friendly, and culturally sensitive HIV prevention strategies.

Conclusion

HIV preventive practices among YMSM in Mahasarakham are suboptimal and influenced by age, education, and health-service utilization. We recommend: Expanding youth-friendly and MSM-friendly healthcare services. Integrating HIV/STI testing with digital health platforms to reach younger populations. Strengthening peer-led interventions to foster positive attitudes toward PrEP and condom use.

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Table 1 Respondents by socio-demographic characteristics (n=650)

Demographic information	Number	Percent
Age (Year old)		
Under 20	140	21.54
20 – 22 years old	350	53.85
Over 23 years old	160	24.62
$\bar{x}$ = 21.52 years, S.D.=2.06, Median= 22, Max.=24, Min.=18		
Education		
University graduate	370	56.92
High school	120	18.46
Secondary school	95	14.62
Primary school	65	10.00
Occupation		
Student	450	69.23
Government Officer	55	8.46
Company/Factory Employee	80	12.31
Self-employed	50	7.69
Seller/Business Owner	15	2.31
Monthly income (Baht)		
0-10,000 Baht	360	55.38
10,001-20,000 Baht	210	32.31
Over 20,000 Baht	80	12.31
$\bar{x}$ =1 1,27800. Baht, S.D.=11140.58, Median=7000, Max.=50000, Min.=0		
Age starting sexual relationship (years old)		
Under 16 years old	200	30.77
16 – 20 years old	310	47.69

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Demographic information	Number	Percent
Over 21 years old	140	21.54
$\bar{x}$ =1 8.19, S.D.=2.78, Median=19, Max.=23, Min.=13		
HIV Screening Test Experience		
Yes	360	55.38
Never	290	44.62
HIV infection prevention		
Using condoms	460	70.77
Using condoms and taking PrEP	110	16.92
Taking PrEP	30	4.62
Never had a sexual relationship	50	7.69

Table 2 Level of HIV/AIDS preventive practices among the respondents in the past six months (n=650)

Level of preventive practices	Number	Percent
Preventive practices	650	
Low practice level	90	13.85
Moderate practice level	340	52.31
High practice level	220	33.85

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Table 3 Binary logistic regression analysis of socio-demographic characteristics associated with HIV/AIDS preventive practices in the past six months

Variables	B	Exp	Crude OR (95% CI)	p-value
Age group				0.006*
Under 20	2.173	0.866	0.17 (0.08-0.64)	
20 – 22 years old	1.832	0.752	0.32 (0.06-0.84)	
Over 23 years old	1.032	0.634	0.43 (0.02-0.18)	
Education				
University graduate (ref :)				0.017*
High school	0.821	0.450	0.54 (0.31-1.03)	
Secondary school	1.034	0.654	0.67 (0.17-0.98)	
Primary school	1.765	0.465	0.29 (0.07-0.54)	
Ever tested for HIV				
Yes (ref :)				0.041*
No	2.045	0.967	0.15 (0.04-0.64)	
HIV infection prevention				
Receiving a sexually transmitted infection check-up in the last 12 months				
Yes (ref :)				
No	-1.564	0.435	0.28 (0.17-0.54)	0.005*

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Table 4 Binary logistic regression analysis of the level of knowledge associated with HIV/AIDS preventive practices in the past six months

Variables	B	Exp	Crude OR (95% CI)	p-value
Level of knowledge				
Low level of knowledge				0.005*
Moderate level of knowledge	0.919	0.480	2.59(1.18-5.70)	0.032
High level of knowledge	1.405	0.456	4.45(2.10-7.97)	0.001

Note. * Correlation is significant at the 0.05 level

Table 5 Binary logistic regression analysis of the level of attitude associated with HIV/AIDS preventive practices in the past six months

Variables	B	Exp	Crude OR (95% CI)	p-value
Level of attitude				
Negative attitude (ref :)				0.016*
Neutral attitude	0.753	0.453	2.23(1.26-3.70)	0.003
Positive attitude	0.875	0.478	2.54(1.19-5.97)	0.016

Note. * Correlation is significant at the 0.05 level

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