Factors Predicting Consistent Use of Pre-Exposure Prophylaxis among Men Who Have Sex with Men in Thailand: A Cross-Sectional Study

Chotravee Injumpa, Boonyada Wongpimoln, Sattawas Udonsat*

Abstract: HIV infection among men who have sex with men is increasing, and pre-exposure prophylaxis is an effective preventive strategy. Nevertheless, research on pre-exposure prophylaxis use behavior among men who have sex with men in Thailand is limited. This cross-sectional study aimed to identify factors predicting consistent use of pre-exposure prophylaxis among this group in Northeastern Thailand. The study included 128 men who have sex with men, selected through multistage sampling. Data were collected through an online survey platform using questionnaires, including a Demographic Data form, the Pre-Exposure Prophylaxis on Knowledge Questionnaire, the Attitude Questionnaire, the Stigma Questionnaire, the Perceived HIV Risk Questionnaire, the Self-Efficacy Questionnaire, and the Pre-Exposure Prophylaxis Use Behavior Questionnaire. Data collection was conducted October 2023 to August 2024. Data were analyzed using descriptive statistics, biserial correlation, and binary logistic regression analysis.

The results indicated that 39.8% of the participants reported consistent use of pre-exposure prophylaxis. Variables that were significantly correlated with regular use included attitude, stigma, and perceived HIV risk. The attitude and perceived HIV risk remained significant predictors among men who have sex with men, accounting for 41.8% of the variance. Nurses and other healthcare professionals may apply these findings to develop programs that promote positive attitudes, reduce stigma, and enhance perceived HIV risk, thereby increasing pre-exposure prophylaxis utilization among at-risk men who have sex with men. Future research should also examine additional influences, including media and community campaigns, partner support, accessibility of healthcare services and clinics, and healthcare providers' attitudes toward men who have sex with men, to further advance understanding of pre-exposure prophylaxis utilization.

Keywords: Behavior, HIV infection, Men who have sex with men, Pre-exposure prophylaxis, Pre-exposure prophylaxis use behavior, Predicting factors, Thailand

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Introduction

Human immunodeficiency virus (HIV) infection remains a major global health challenge, with an estimated 4.5 million new cases reported worldwide in 2022.[1] In Thailand, approximately 560,000 people are living with HIV, and 11,000

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AIDS-related deaths occur annually. Men who have sex with men (MSM) represented the majority of new infections, accounting for 68% of the 9,200 newly reported cases, with the highest incidence in the Northeastern region.[2] Despite overall declines in other groups, MSM remain the primary high-risk population.[3] Pre-exposure prophylaxis (PrEP) use means taking antiretroviral medication before possible HIV exposure to reduce the likelihood of HIV infection and has increased fourteen-fold since its introduction in 2016; however, only 18% of MSM had received information about PrEP and 36% had ever used it.[4] In addition, a systematic review and meta-analysis of 50 studies found that 19.3% of MSM had previously used PrEP (95% CI: 13.9-26.2), with an increasing trend in PrEP uptake observed.[5] In Thailand, the proportion of consistent use of PrEP among MSM ranges from 10% to 50%. These analyses began in 2015, coinciding with the introduction of PrEP in the country.[6] Willingness to use PrEP remains low, and limited knowledge, awareness, and uptake highlight continued gaps in HIV prevention among this population.[7,8]

PrEP is an effective and safe HIV prevention strategy, particularly among MSM, with efficacy rates of up to 90% and minimal side effects.[9-11] Since 2014, PrEP has been included in Thailand's national HIV testing, treatment, and prevention guidelines.[12] It is available in two dosing regimens: daily PrEP (one pill per day) and on-demand, both containing Tenofovir disoproxil fumarate (300 mg) and Emtricitabine (200 mg).[13] PrEP is recommended for individuals at sustained high risk, such as those with HIV-positive partners not yet virally suppressed, inconsistent condom use, recent injection drug use, or sexually transmitted infections.[12-14] Although PrEP is a key component of the UNAIDS strategy aimed at achieving zero new HIV infections, zero AIDS-related deaths, and zero discrimination,[15] its effectiveness depends heavily on consistent adherence, as poor compliance reduces protective efficacy and increases the risk of drug resistance.[1,11,16] Although PrEP effectively prevents HIV-infection, its impact on the HIV-epidemic is contingent on uptake among those at highest risk,[17] especially among MSM. However, consistent condom use combined with safe sexual practices remains the most effective HIV prevention strategy.

Previous literature indicates that PrEP use among MSM is influenced by knowledge,[18] attitudes,[4,19] stigma,[18,20] perceived HIV risk,[19] and self-efficacy.[21] These determinants align with the Information-Motivation-Behavioral Skills (IMB) model,[22] which highlights that accurate knowledge, motivation, and behavioral skills are essential for HIV preventive behaviors.[22,23] However, no studies have examined PrEP use behaviors among MSM in Thailand, where the highest incidence of new HIV infections is observed. This knowledge gap hinders understanding of factors influencing PrEP use. Therefore, exploring the factors that influence consistent use of PrEP is useful for health professionals, including nurses, in designing a program based on these factors to inform HIV prevention strategies and promote PrEP utilization among at-risk MSM.

Conceptual Framework

This study employed the Information-Motivation-Behavioral Skills (IMB) model by Fisher and Fisher,[22] which has been effectively and appropriately adapted to examine HIV prevention behaviors among MSM in various contexts.[18] According to this model, HIV preventive behavior is determined by three key components, including: 1) Information, which refers to the acquisition of knowledge that is specific and personally relevant to the individual, and information helps to fill knowledge gaps related to HIV transmission and prevention. It is not merely general information, but rather targeted content that can directly influence the adoption of HIV preventive behaviors when appropriately communicated; 2) Motivation refers to the appropriate internal drive that fosters the intention to engage in HIV preventive behaviors. Strong and

sustained intentionality increases the likelihood that individuals will adopt such behaviors. Motivation is delineated into two distinct but complementary dimensions: first, personal motivation, encompassing an individual's attitudes and perceptions regarding HIV preventive behaviors. Specifically, more favorable attitudes toward prevention and heightened personal risk perception enhance individuals' internal drive to engage in such behaviors. Moreover, second, social motivation, reflecting the influence of external social factors such as encouragement from sexual partners, family, or broader social networks that support and reinforce the practice of HIV preventive behaviors. Together, these motivational constructs interact with relevant information and behavioral skills to foster successful adoption of HIV preventive actions; and 3) behavioral skills. Although knowledge and motivation are effective in enabling individuals to engage in HIV prevention behaviors, behavioral skills constitute another essential element that facilitates the effective adoption of such behaviors. Behavioral skills can generally be categorized as follows: firstly, an individual's objective ability: the actual capacity of an individual to perform preventive behaviors. Secondly, perceived self-efficacy: the individual's belief in their ability to control and carry out HIV-prevention behaviors. When individuals possess confidence in their ability to regulate their actions, they are more likely to decide to engage in, and subsequently perform, HIV prevention behaviors. The IMB model posits that information and motivation can directly influence HIV preventive behavior. However, the development of HIV preventive behavioral skills arises from both information and motivation. These two components contribute to the development of behavioral skills, which, in turn, lead to the adoption of HIV-preventive behaviors.[21,24,25]

In this study, consistent use of PrEP refers to actions resulting from MSM's decisions regarding adherence to PrEP; the key components of the IMB model were applied.[22] Firstly, information relates to knowledge about PrEP use. Based on the IMB model, it was posited that even if individuals are highly motivated to engage in HIV preventive behaviors, without specific and relevant information to fill existing knowledge gaps, MSM may still be unable to perform appropriate and effective HIV preventive behaviors.[18] Conversely, when MSM possess accurate knowledge about HIV and its prevention, they tend to engage in appropriate HIV preventive behaviors directly. Secondly, motivation includes PrEP attitudes, PrEP stigma, and perceived HIV risk. These three factors are considered forms of personal motivation. When MSM hold positive attitudes toward HIV preventive behaviors, they are more motivated to and determined to engage in such behaviors successfully.[18,19,23] Additionally, low levels of stigma from others regarding PrEP use can further support the successful adoption of HIV preventive behaviors. Moreover, when MSM perceive themselves to be at high risk of HIV infection, this perception can enhance their motivation to engage in preventive actions in order to avoid becoming infected. Lastly, behavioral skills refer to perceived self-efficacy in using PrEP. When MSM believe in their capacity to manage their behavior effectively to prevent HIV infection, they are more inclined to make decisions and engage in preventive actions accordingly. Based on the review of relevant literature, this variable was incorporated into the present study.

Study Aim

This study aimed to examine consistent use of PrEP and to determine whether knowledge, attitudes, stigma, perceived HIV risk, and self-efficacy can predict consistent use of PrEP among Thai MSM.

Methods

Study Design: This study used a descriptive, cross-sectional design. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) standards were used to guide this report.

Sample and Setting: The study population comprised MSM aged 18-60 years who accessed MSM-specific services as either new or returning clients at clinics in the three provinces of Northeastern Thailand. These clinics offer comprehensive sexual health services, encompassing sexual health counseling, HIV and STDs testing, as well as access to PrEP. This study employed a multi-stage sampling approach. In the first stage, one province was purposively selected from each of the three Northeastern subregions, characterized by MSM populations shaped by labor migration, high HIV prevalence with low testing uptake, and pervasive sociocultural stigma, with participants recruited from provinces with the highest density of MSM-serving health centers,[26] where structural barriers were likely to constrain access to HIV prevention services and consistent PrEP use: Province A, Province B, and Province C. In the second stage, one community-based organization or health center that provided MSM-specific sexual health services was randomly selected from each province. Finally, participants were recruited from the selected centers using purposive sampling, an appropriate method given the hidden nature of MSM populations and the need for the inclusion criteria as follows: 1) having used PrEP at least once in their lifetime, 2) an HIV-negative or unknown HIV test result, 3) ability to read and comprehend the Thai language, and 4) ownership of, and ability to use a smartphone or tablet. Exclusion criteria included having a history of being HIV-positive.

Sample Size: Using G*Power 3.1.9.2,[27] we performed a power analysis to calculate the sample size. The statistical test chosen was linear multiple regression: a fixed-effects model R2 deviating from zero, with an effect size set to medium (0.15), derived from a literature review on predictors of attitudes toward PrEP.[18] The confidence level was set at 0.05, and the power of the test was set at 0.90. Based on these parameters, the initial sample size was 116 participants. An additional 10% was added to the sample size to account for potential variability in the data.[28] Therefore, the sample size for this study was 128 participants. To ensure proportional representation, the probability proportional to size (PPS) method was applied using client volume data.[28] The final sample included 40 MSM from Province A, 34 from Province B, and 54 from Province C, for a total of 128 participants.

Ethical Considerations: This study was approved by the Human Research Ethics Committee of Roi Et Rajabhat University (Approval No. 087/2566 (August 2023-2024)). After approval was granted, the primary investigator (PI) obtained the clinic director's permission to identify eligible participants. Regarding the participant recruitment, the research assistants (RAs) provided and explained the study information to participants. Participants were free to choose whether to participate in the study on their own and could decline or leave at any time without facing any consequences. After being informed about the study's objectives, potential benefits, and their rights, participants completed an online questionnaire using Google Forms. They could skip sensitive questions or withdraw at any time without consequence. All data was kept confidential and reported in aggregate to ensure anonymity and prevent any harm to participants.

Research Instruments: This study employed seven research instruments. All instruments, except the Demographic, Perceived HIV Risk, and PrEP Use Behaviors Questionnaires, were translated into Thai using a standardized back-translation method,[29] with permission from the original authors. The scale translation process consisted of two independent forward translations conducted by native translators, followed by synthesis of the translated versions. Subsequently, a back-translation was performed by a fluent translator with cultural familiarity with the original instrument. The back-translation was reviewed by an expert panel, after which the researchers conducted a final evaluation of the translated version. To ensure content validity, a panel of three experts, including a nursing instructor specializing in research

on MSM, a behavioral science instructor, and a nursing instructor specializing in infection control and HIV, was assembled. The S-CVI reliability type and value (both in the pilot study with 128 participants and in the actual study), along with an example of items, are shown in **Table 1.**

Table 1. Content validity index, reliability, and examples of items of the instruments

Instruments	CVI	Reliability		Example of items
	S-CVI	Pilot study	Main study	
PrEP knowledge	0.92	0.82[b]	0.86[b]	"You should not use PrEP if you don't know your HIV status."
PrEP attitudes	1.00	0.92[a]	0.98[a]	"Taking PrEP is safe."
PrEP stigma	1.00	0.84[a]	0.86[a]	"People who take PrEP are promiscuous."
Perceived HIV risk	0.98	0.92[a]	0.96[a]	"Having multiple sexual partners increases the risk of HIV infection."
PrEP self-efficacy	1.00	0.86[a]	0.94[a]	"How difficult would it be for you to visit a doctor who can provide PrEP?"
PrEP use behaviors	1.00	0.92[a]	0.94[a]	"You use PrEP in combination with condom use during sexual intercourse."

Note. [a] = Cronbach's alpha; [b] = KR-20, CVI = Content validity index, S-CVI = Scale-content validity index, PrEP = Pre-exposure prophylaxis, HIV = Human immunodeficiency virus

The Demographic Questionnaire was developed by the PI to record background data, including age, sexual orientation, education level, occupation, monthly income, health insurance status, sexual partner, and history of PrEP use.

The PrEP Knowledge Questionnaire: This instrument was originally developed by Walsh.[18] We translated into Thai and modified some items to better fit with Thai MSM, with permission from the developers. Knowledge was assessed using ten items, with a total score ranging from 0 to 10. Participants had three response options: True, False, or Do not Know. Items were scored as correct (1) or incorrect/do not know (0); higher scores indicated more knowledge of PrEP. The scores can be classified into high (≥ 80%), moderate (60-79.9%), and low (< 60%).[18]

The PrEP Attitudes Questionnaire: This instrument was originally developed by Walsh.[18] We translated it into Thai and modified some items to better fit with Thai MSM, with permission from the developers. Attitudes were assessed with five items. All items are positively worded questions. Total scores range from 5 to 25. Responses are on a 5-point scale from strongly disagree (1) to strongly agree (5), with higher scores indicating more attitudes toward PrEP. The scores can be classified into high (≥ 80% or ≥ 20 points), moderate (60-79% or 15-19 points), and low (< 60% or < 15 points).[18]

The PrEP Stigma Questionnaire: This instrument was originally developed by Walsh.[18] We translated it into Thai and modified some items to better suit the Thai MSM with permission from the developers, and it has a Cronbach's alpha of 1. It comprises five items with a total score ranging from 5 to 25. All items are negatively worded questions. Responses are on a 5-point scale from strongly disagree (1) to strongly agree (5), with higher scores indicating more stigma. The scores can be classified into high (≥ 80% or ≥ 20 points), moderate (60-79% or 15-19 points), and low (< 60% or < 15 points) based on the method postulated by Walsh.[18]

The Perceived HIV Risk Questionnaire was developed by the PI based on a literature review, and it has a Cronbach's alpha of 1. It comprises five items

with a total score ranging from 5 to 25. All items are positively worded questions. Responses are on a 5-point scale from strongly disagree (1) to strongly agree (5), with higher scores indicating more perceived HIV risk. The scores can be classified into high (≥ 80% or ≥ 20 points), moderate (60-79% or 15-19 points), and low (< 60% or < 15 points).[30]

The PrEP Self-Efficacy Questionnaire, developed by Walsh,[18] has a Cronbach's alpha of 1, and was assessed with five items. The total score ranges from 5 to 25. All items are positively worded questions. Responses are on a 5-point scale from strongly disagree (1) to strongly agree (5), with a higher score indicating greater self-efficacy. The scores can be classified into high (≥ 80% or ≥ 20 points), moderate (60-79% or 15-19 points), and low (< 60% or < 15 points).[18]

The PrEP Use Behaviors Questionnaire was developed by the PI based on a literature review, with a Cronbach's alpha of 1. It comprises four items with a total score ranging from 4 to 16. All items are positively worded questions. Responses are on a 4-point scale from use once in a while (1) to use regularly (4), with higher scores indicating consistent use of PrEP behaviors. The scores can be classified into consistently using PrEP (≥ 80% or ≥13 points) and inconsistently using PrEP (< 80% or ≤ 12 points).[30]

Data Collection: The PI recruited three research assistants (RAs) from three research settings based on the following criteria: (1) current employment as a consultant or nursing staff, (2) a minimum of one year of experience working with MSM, and (3) possession of a bachelor's degree or higher. The RAs were responsible for participant recruitment, obtaining informed consent, and data collection. Before data collection, the PI provided training to the RAs on study objectives, eligibility criteria, data collection procedures, and participants' rights. If participants agreed to join in the research, then informed consent was obtained via an online survey platform. Participants accessed the questionnaire by scanning a QR code using a mobile phone, tablet, or computer. The initial page displayed the informed consent form; those who declined were given the option to exit the platform without proceeding to the questionnaire. The RAs were available to support participants in completing the questionnaire as needed. The online questionnaire required approximately 15-30 minutes to complete and was administered in a consultation room or health education room at each study site.

Data Analysis: The researcher used SPSS version 26 to analyze the data. The demographic data were analyzed using descriptive statistics, such as frequencies, percentages, means, and standard deviations. Biserial correlation was used to examine relationships among variables, and binary logistic regression was employed to identify predictive factors, with a significance level set at 0.05. All assumptions of multivariate analysis (such as normality, linearity, homoscedasticity, and multicollinearity) were met; binary logistic regression was used to assess the predictive power of the independent variables for consistent PrEP use.

Results

Characteristics of participants

In this study, questionnaires were distributed to 128 participants, with a 100% response rate and no missing data. The participants had an average age of 27.70 years (SD = 6.42) and mostly identified as gay (88.29%). The majority held a bachelor's degree (68.80%), and almost half (44.50%) were civil servants. The average monthly income ranged from 10,001 to 15,000 baht (317.49- 476.19 USD). Nearly half of the participants had a regular sexual partner (49.20%), while 39.10% reported having casual partners. Most participants utilized the Universal Coverage Scheme for healthcare services (52.30%), followed by the Civil Servant Medical Benefit Scheme (24.20%). More than half of the participants had been using PrEP for more than 6 months (54.20%),

as shown in **Table 2.** For PrEP use, fewer than half of participants (39.80%) consistently used PrEP, while the majority (60.20%) reported inconsistent use (see **Table 3**).

Table 2. Descriptive characteristics of the participants (n = 128)

Characteristics	Frequency (n)	Percentage (%)
Age (years) (Range = 18-27, Mean = 27.70, SD = 6.42)		
18-27	63	49.22
28-37	54	42.18
37-46	11	8.60
Sexual orientation		
Gay	113	88.29
Bisexual	10	7.81
Transgender woman	5	3.90
Education level		
Secondary school	12	9.40
Associate degree	18	14.00
Bachelor degree	88	68.80
Master degree	10	7.80
Occupation		
Student	7	5.50
Employee	31	24.20
Private company employees	21	16.40
Civil servant	57	44.50
Business owner	12	9.40
Monthly income		
5,001 to 10,000 baht (158.76-317.46 USD)	28	21.90
10,001 to 15,000 baht (317.49-76.19 USD)	76	59.30
≥ 15,001 baht (≥ 476.22 USD)	24	18.80
Health insurance status		
Universal coverage scheme	67	52.30
Civil servant medical benefit scheme	31	24.20
Social security	27	21.10
Insurance	3	2.30
Sexual partner		
Regular sexual partner	63	49.20
Casual sexual partners	50	39.10
Regular & casual sexual partner	15	11.70
History of pre-exposure prophylaxis use		
Yes	69	54.20
No	59	45.80

Table 3. Range, mean, and standard deviation of study variables

Variables	Possible range	Actual range	Mean	SD	Level
PrEP knowledge	0-10	2-8	5.27	3.30	low
PrEP attitude	5-25	16-24	18.08	2.16	high
PrEP stigma	5-25	9-23	17.42	2.14	moderate
Perceived HIV risk	5-25	10-22	13.09	2.44	moderate
PrEP self-efficacy	5-25	12-22	14.13	3.02	moderate
PrEP use behaviors	4-16	8-14	11.69	1.97	n = 51 (≥ 13) (39.80%) = Consistent n = 77 (≤ 12) (60.20%) = Inconsistent

Note. PrEP = Pre-exposure prophylaxis, HIV = Human immunodeficiency virus

The correlation among all studied variables demonstrated that PrEP attitudes and perceived HIV risk were moderately, positively, and significantly correlated with PrEP use behaviors, whereas PrEP stigma was negatively and significantly correlated with PrEP use behaviors at a moderate level (see **Table 4**).

Table 4. Correlations among the study variables

Variables	1	2	3	4	5	6
1. PrEP knowledge	1.00					
2. PrEP attitude	-0.03	1.00				
3. PrEP stigma	-0.07	0.53**	1.00			
4. Perceived HIV risk	0.04*	0.46**	-0.12**	1.00		
5. PrEP self-efficacy	-0.22*	0.40**	-0.40	0.22	1.00	
6. PrEP use behaviors	-0.02	0.46**	-0.52**	0.68***	-0.01	1.00

Note. *p < 0.05, **p < 0.01, ***p < 0.001, PrEP = Pre-exposure prophylaxis, HIV = Human immunodeficiency virus

Predictors of consistent use of PrEP among MSM: The results of the binary logistic regression analysis revealed that two variables, PrEP attitudes and perceived HIV risk, significantly predicted consistent use of PrEP. This model explained 41.8% of the variance in consistent use of PrEP among MSM (Nagelkerke R2 = 0.418) (see **Table 5**).

Table 5. Binary logistic regression model: Predictors of consistent use of PrEP among MSM (n = 128)

Prediction factor	β	SE	df	p-value	Exp(B)	95% CI	
						lower	upper
PrEP Attitude	0.295	0.130	1	0.023	1.344	1.041	1.734
Perceived HIV risk	0.274	0.127	1	0.031	1.315	1.026	1.685
Constant	-6.639	1.544	1	0.001	0.001		

Note. -2 Log likelihood = 124.843; Nagelkerke R^2 = 0.418, Homer-Lemeshow test: p > 0.05, PrEP = Pre-exposure prophylaxis, HIV = Human immunodeficiency virus

Discussion

The study found that the consistent use of PrEP among MSM was at 39.80, which is in line with a previous study[19] that investigated PrEP taking behavior among MSM in Bangkok. This study reported that the majority of participants (54.20%) had used PrEP for more than six months. This group had some experience with PrEP, which likely increased their awareness of personal health and led to stronger preventive behaviors. Additionally, most participants in this study held a bachelor's degree (68.80%), indicating a higher level of education and better access to reliable health information. However, nearly half of the participants (49.20%) reported having a regular sexual partner, which may have contributed to the moderate level of PrEP use behavior, possibly due to the perception that they were not at high risk because they did not frequently change partners. This finding also suggests that although PrEP has gained some acceptance among this population, its use is not yet high or consistent. The moderate level of consistent PrEP use may reflect discontinuity in usage, as consistent PrEP use is often associated with motivation levels and self-assessment of HIV risk. According to Fisher and Fisher,[22] when MSM do not perceive themselves to be at risk, they may place less importance on using PrEP regularly.

The findings of this study indicated that perceived HIV risk was a significant predictor of consistent use of PrEP behavior. One possible explanation is that participants demonstrated a moderate level of perceived HIV infection risk, which may have contributed to the statistical significance of the results. These findings suggest that individuals who perceive themselves to be at higher risk of HIV infection are more likely to decide to use PrEP compared with those who perceive themselves to be at lower risk. This aligns with the IMB Model,[22] which states that perceiving oneself to be at high risk, such as having multiple sexual partners, not using condoms, or engaging in other risky behaviors, serves as a form of personal motivation that influences the intention to use PrEP for self-protection. Accurate risk perception enables MSM to recognize the necessity of HIV prevention, thereby stimulating positive health behavior.[31] Furthermore, in the context of MSM in northeastern Thailand, where stigma related to sexual behavior still persists, perceiving oneself as engaging in risky behavior may serve as a driving force that fosters awareness and encourages self-protective measures such as the use of PrEP.[26] However, even though individuals with high-risk perception are more likely to use PrEP, the absence of other components, such as knowledge, access to services, and social support, may still hinder the actual adoption of PrEP use.[32] Additionally, PrEP attitudes were identified as a statistically significant predictor of consistent use of PrEP. This may be attributable to more positive attitudes, which were associated with higher levels of PrEP use. This indicates that positive attitudes play a crucial role in encouraging MSM to use PrEP for HIV prevention. This finding can be explained by the IMB Model, which views personal motivation, such as a positive attitude toward HIV prevention, as a key factor in stimulating the adoption of appropriate preventive behaviors.[33] MSM who hold positive PrEP attitudes are more likely to recognize its value and benefits, viewing PrEP as an effective method for HIV prevention. Similarly, a previous study found that MSM who believed in the high effectiveness of PrEP in preventing HIV infection were more likely to use it compared to those who were skeptical about its efficacy.[34]

The variables that were not significant predictors of consistent use of PrEP included PrEP knowledge, PrEP stigma, and PrEP self-efficacy. The finding that the PrEP knowledge level could not significantly predict consistent use of PrEP may reflect that knowledge alone is insufficient to drive desirable health behaviors. In addition, the participants demonstrated a low level of knowledge about PrEP, despite the majority

holding a bachelor's degree and being employed in stable occupations. This finding may be explained by limited awareness and exposure to PrEP-specific information, suggesting that general educational attainment does not necessarily translate into adequate knowledge of HIV prevention strategies such as PrEP. This is consistent with the IMB model, which states that "knowledge is a necessary but not sufficient condition for the adoption of health-related preventive behaviors ([22,p.466])." Without adequate motivation or behavioral skills, the desired behavior may not occur.[33] Additionally, the primary obstacles to the initiation of PrEP were limited accessibility and insufficient knowledge.[35]

PrEP stigma was not found to be a statistically significant predictor of consistent use of PrEP. This may suggest that, in certain MSM contexts, the influence of stigma may be less prominent compared to other factors such as belief in the effectiveness of PrEP, perceived HIV risk, or support from peers and the community. Despite exhibiting a notable association with PrEP use behaviors at the bivariate level, stigma did not retain statistical significance in the multivariable analysis. This pattern suggests that stigma may have influenced PrEP use indirectly by overlapping with perceived HIV risk, thereby reducing its unique contribution when both factors were considered simultaneously. In addition, the inclusion of participants from MSM-affirming health care settings may have lessened the detrimental effects of stigma by fostering access to supportive and nonjudgmental services. Although previous studies have identified stigma as a major barrier to accessing and using PrEP,[36] in some settings, particularly where individuals receive accurate information, have confidence in using PrEP, and do not feel concerned about social judgment, stigma may not be a strong enough influence to deter PrEP use behavior. Moreover, while internalized stigma may influence PrEP utilization, the degree to which they encounter logistical obstacles in receiving PrEP (such as health care coverage and transportation to the clinic) is more significant.[37] Consistent with this perspective, participants in this study were recruited from sexual health service settings, where exposure to nonjudgmental care and peer support may have reduced internalized stigma and mitigated its impact on consistent use of PrEP.

Perceived self-efficacy in using PrEP was not found to be a statistically significant predictor of consistent use of PrEP. This may suggest that self-perceived ability alone is insufficient to drive actual PrEP use behavior, particularly in the context of Northeastern Thailand, sociocultural norms, persistent stigma, the limited presence of MSM-friendly health services, and structural barriers to accessing PrEP in this region may diminish the influence of individual self-efficacy on PrEP uptake. In this context, PrEP utilization may be driven more by external determinants, such as the availability and accessibility of healthcare services and community-level support, than by individual confidence alone.[35] Similar findings found that even when MSM exhibited high self-efficacy, a lack of support systems or limited access to services hindered the translation of intention into action.[38] In addition, although self-efficacy is a critical concept in health behaviors, it does not always translate directly into action. In this particular context, the mere perception of being capable of utilizing PrEP was insufficient to ensure that an individual would actually do so.[39] This aligns with the IMB model, which asserts that self-efficacy alone is not enough; motivation and accurate, relevant information are also essential to facilitate behavior change.[22]

Limitations and Strengths

This study had some limitations. The participants were MSMs selected through purposive sampling in three provinces in the northeast of Thailand, which may limit the generalizability of the findings to MSMs in other areas of Thailand. Additionally, the study does not adequately reflect the theoretical structure of

the IMB model, in which self-efficacy was modeled independently rather than as a mediating variable. This likely led to non-significant findings, undermining the study's explanatory power.

Despite the noted limitations, this study has several important strengths. First, it is one of the few theory-driven investigations to use the framework to predict consistent PrEP use among MSM. Second, the study employed validated instruments with acceptable internal consistency and theoretical alignment, ensuring the reliability and relevance of the measured constructs.

Conclusions and Implications for Nursing Practice and Future Research

The findings indicate that attitudes toward PrEP and perceived HIV risk are significant predictors of consistent PrEP use among MSM. Nursing interventions should strengthen perceptions of HIV risk and promote positive attitudes toward PrEP to motivate and support MSM and improve their access to health information. Encouraging social engagement and peer connection may also facilitate consistent PrEP use. As the variables in this study explained 41.8% of the variance in consistent PrEP use, future research should examine additional factors, such as media and community campaigns, partner support, service accessibility, and healthcare providers' attitudes toward MSM, to clarify determinants of PrEP utilization further.

Author Contributions

Conceptualization, Method and design: C.I., B.W., S.U.
Data collection, Drafting the manuscript: B.W., C.I.
Data analysis and interpretation: C.I., B.W.
Editing the manuscript: B.W., C.I.
Revising the manuscript: C.I., B.W.
Final approval of the manuscript: C.I., B.W., S.U.

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References

1. World Health Organization. Global health sector strategies on, respectively, HIV, viral hepatitis and sexually transmitted infections for the period 2022-2030 [Internet]. 2022 July 18 [cited 2025 Aug 27]. Available from: https://www.who.int/publications-detail-redirect/9789240053779
2. Division of AIDS and STIs, Department of Disease Control, Ministry of Public Health. HIV situation in Thailand, 2023 [Internet]. Nonthaburi: Department of Disease Control; 2023 [cited 2025 Aug 30]. Available from: https://hivhub.ddc.moph.go.th/officer/Download/RRTTR/HIV_Factsheet2023_TH_Final_021067.pdf (in Thai).
3. Yang Z, Wei L, Xu Z, Li S, Xing Y, Zhang Y, et al. HIV risk and influence factors among MSM who sought sexual partners in core venues: a continuous sentinel surveillance from 2010 to 2022. Front Public Health. 2024;12:1476642. doi: 10.3389/fpubh.2024.1476642.
4. Auemaneekul N, Lertpruek S, Satitvipawee P, Tuah NA. Pre-exposure prophylaxis uptake for HIV infection prevention among young men who have sex with men and transgender women in Bangkok, Thailand. J Health Res. 2021;35(5):434-43. doi: 10.1108/JHR-10-2019-0242.
5. Zhao Y, Li H, Huang Y, Zhou Z, He Z, Agins B, et al. HIV pre-exposure prophylaxis (PrEP) use among PrEP-eligible men who have sex with men: a systematic review and meta-analysis. Int J Infect Dis. 2025;154:107874. doi: 10.1016/j.ijid.2025.107874.
6. Versteegh L, Amatavete S, Chinbunchorn T, Thammasiha N, Mukherjee S, Popping S, et al. The epidemiological impact and cost-effectiveness of key population-led PrEP delivery to prevent HIV among men who have sex with men in Thailand: a modelling study. Lancet Reg Health Southeast Asia. 2022;7:100097. doi: 10.1016/j.lansea.2022.100097.

7. Sun Y, Lu H, Ye J, Li D, Li G. Awareness and use of HIV pre-exposure prophylaxis and factors associated with awareness among MSM in Beijing, China. Sci Rep. 2023;13(1):554. doi: 10.1038/s41598-023-27485-8.
8. Zhang G, Yang X, Kang W, Liu T, Cheng L, Qu M, et al. Pre-exposure prophylaxis uptake for high-risk men who have sex with men in China: a multi-city cross-sectional survey. AIDS Res Ther. 2023;20(1):32. doi: 10.1186/s12981-023-00528-w.
9. Ramautarsing RA, Meksena R, Sungsing T, Chinbunchorn T, Sangprasert T, Fungfoosri O, et al. Evaluation of a pre-exposure prophylaxis programme for men who have sex with men and transgender women in Thailand: learning through the HIV prevention cascade lens. J Int AIDS Soc. 2020;23(Suppl 3):e25540. doi: 10.1002/jia2.25540.
10. Stansfield SE, Moore M, Boily MC, Hughes JP, Donnell DJ, Dimitrov DT. Estimating benefits of using on-demand oral PrEP by MSM: a comparative modeling study of the US and Thailand. EClinicalMedicine. 2022;56:101776. doi:10.1016/j.eclinm.2022.101776.
11. World Health Organization. Guidance on pre-exposure oral prophylaxis (PrEP) for serodiscordant couples, men and transgender women who have sex with men at high risk of HIV: recommendations for use in the context of demonstration projects [Internet]. Geneva: World Health Organization; 2012 July 1 [cited 2025 Aug 27]. Available from: https://apps.who.int/iris/handle/10665/75191
12. Division of AIDS and STIs, Department of Disease Control, Ministry of Public Health. Thailand national guideline on pre-exposure prophylaxis: HIV-PrEP 2018. Nonthaburi: Department of Disease Control; 2018.
13. Patel RR, Crane JS, López J, Chan PA, Liu AY, Tooba R, et al. Pre-exposure prophylaxis for HIV prevention preferences among young adult African American men who have sex with men. PLoS One. 2018;13(12):e0209484. doi: 10.1371/journal.pone.0209484.
14. Tangpatomwong N. Familiarity, trust, and health behavior values: tendency of choosing PrEP and use or non-use condom by key population at risk of HIV acquisition at the modern time. Thai AIDS J. 2020;32(3):79-93. doi: 10.14456/taj.2020.7 (in Thai).
15. UNAIDS. UNAIDS and Global Fund sign a new strategic framework for their collaboration to end AIDS [Internet]. Geneva: UNAIDS; 2024 June 24 [cited 2025 Aug 28]. Available from: https://www.unaids.org/en/resources/presscentre/pressreleaseandstatementarchive/2024/june/20240624_global-fund
16. Department of Disease Control. Thailand national guidelines on HIV/AIDS diagnosis, treatment and prevention 2020/2021 [Internet]. Nonthaburi: Department of Disease Control; 2020 [cited 2025 Aug 30]. Available from: https://www.thaiaidssociety.org/wp-content/uploads/2022/02/Thailand-National-Guidelines-on-HIV-AIDS-Diagnosis-Treatment-and-Prevention-2020-2021.pdf (in Thai).
17. Rodriguez K, Kelvin EA, Grov C, Meyers K, Nash D, Wyka K. Exploration of the complex relationships among multilevel predictors of PrEP use among men who have sex with men in the United States. AIDS Behav. 2021;25(3):798-808. doi: 10.1007/s10461-020-03039-1.
18. Walsh JL. Applying the Information-Motivation-Behavioral Skills model to understand PrEP intentions and use among men who have sex with men. AIDS Behav. 2019;23(7):1904-16. doi: 10.1007/s10461-018-2371-3.
19. Chakrabath N, Auemaneekul N, Powwattana A. Predicting factors for pre-exposure prophylaxis PrEP taking-behaviors among men who have sex with men in Bangkok Metropolis. Royal Thai Navy Med J. 2021;48(3):611-30. Available from: https://he01.tci-thaijo.org/index.php/nmdjournal/article/view/248116 (in Thai).
20. Eaton LA, Kalichman SC, Price D, Finneran S, Allen A, Maksut J. Stigma and conspiracy beliefs related to pre-exposure prophylaxis (PrEP) and interest in using PrEP among black and white men and transgender women who have sex with men. AIDS Behav. 2017; 21(5):1236-46. doi: 10.1007/s10461-017-1690-0.
21. Knox J, Kutner BA, Shiau S, Winterhalter FS, Wu Y, Hirsch-Moverman Y, et al. Assessing the Information-Motivation-Behavioral Skills Model to predict pre-exposure prophylaxis adherence among black men who have sex with men and transgender women in a community setting in New York city. AIDS Behav. 2022;26(7):2494-502. doi: 10.1007/s10461-022-03588-7.

22. Fisher JD, Fisher WA, Shuper PA. The Information-Motivation-Behavioral Skills model of HIV preventive behavior. In: DiClemente RJ, Crosby RA, Kegler MC, editors. Emerging theories in health promotion practice and research. 2nd ed. New York: Jossey-Bass; 2009. pp. 21-63.
23. Dubov A, Altice FL, Fraenkel L. An Information-Motivation-Behavioral Skills model of PrEP uptake. AIDS Behav. 2018;22(11):3603-16. doi: 10.1007/s10461-018-2095-4.
24. Naar S, Outlaw A, MacDonell K, Jones M, White J, Secord E, et al. Information-Motivation-Behavioral Skills model in youth newly starting antiretroviral treatment. AIDS Behav. 2023;27(8):2785-90. doi: 10.1007/s10461-023-04002-6.
25. Lin B, Liu J, Pan H, He W, Zhang H, Zhong X. Longitudinal relationship between pre-exposure prophylaxis motivation and change in adherence among men who have sex with men in Western China. BMC Public Health. 2024;24(1):1271. doi: 10.1186/s12889-024-18729-x.
26. Longkul J, Promthet S, Bradshaw P. Utilisation of voluntary confidential counselling and testing for HIV by men who have sex with men in Northeastern Thailand. J Health Res. 2017;31(1):15-21. doi: 10.14456/jhr.2017.3.
27. Faul F, Erdfelder E, Lang AG, Buchner A. G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behav Res Methods. 2007;39(2):175-91. doi: 10.3758/bf03193146.
28. Lemeshow S, Hosmer Jr DW, Klar J, Lwanga SK. Adequacy of sample size in health studies. Chichester: John Wiley & Sons; 1990.
29. World Health Organization. Process of translation and adaptation of instruments. Geneva, Switzerland: World Health Organization; 2018.
30. Bloom BS. Handbook on formative and summative evaluation of student learning. New York: McGraw-Hill; 1971.
31. Sun S, Yang C, Zaller N, Zhang Z, Zhang H, Operario D. PrEP willingness and adherence self-efficacy among men who have sex with men with recent condomless anal sex in urban China. AIDS Behav. 2021;25(11):3482-93. doi: 10.1007/s10461-021-03274-0.
32. Dubov A, Galbo P, Altice FL, Fraenkel L. Stigma and shame experiences by MSM who take PrEP for HIV prevention: a qualitative study. Am J Mens Health. 2018;12(6):1843-54.doi:10.1177/1557988318797437.
33. Fisher JD, Fisher WA. Changing AIDS-risk behavior. Psychol Bull. 1992;111(3):455-74.doi:10.1037/0033-2909. 111.3.455.
34. Zhang C, Liu Y. Understanding the association between PrEP stigma and PrEP cascade moderated by the intensity of HIV testing. Trop Med Infect Dis. 2022;7(5):74. doi: 10.3390/tropicalmed7050074.
35. Yu YJ, Schieber E, Janamnuaysook R, Wang B, Gunasekar A, MacDonell K, et al. Barriers and facilitators to pre-exposure prophylaxis (PrEP) uptake and adherence among men who have sex with men (MSM) in Thailand: a qualitative study. AIDS Care. 2024;36(8):1126-34. doi:10.1080/09540121.2024.2332443.
36. Eaton LA, Driffin DD, Kegler C, Smith H, Conway-Washington C, White D, et al. The role of stigma and medical mistrust in the routine health care engagement of black men who have sex with men. Am J Public Health. 2015;105(2):e75-82. doi: 10.2105/AJPH.2014.302322.
37. Watson RJ, Chang CJ, Feinstein BA, Moody RL, Caba A, Eaton LA. PrEP stigma and logistical barriers remain significant challenges in curtailing HIV transmission among Black and Hispanic/Latinx cisgender sexual minority men and transgender women in the US. AIDS Care. 2022;34(11):1465-72. doi: 10.1080/09540121.2022.2098908.
38. Maksut JL, Eaton LA, Driver R, Knowles CM, Watson RJ. Factors associated with awareness and use of pre-exposure prophylaxis (PrEP) among black men who have sex with men with a recent STI diagnosis. Behav Med. 2021;47(2):161-9.doi:10.1080/08964289.2019.1692776.
39. Qu D, Zhong X, Lai M, Dai J, Liang H, Huang A. Influencing factors of pre-exposure prophylaxis self-efficacy among men who have sex with men. Am J Mens Health. 2019;13(2):1557988319847088. doi:10.1177/1557988319847088.

ปัจจัยทำนายพฤติกรรมการใช้ยาต้านไวรัสก่อนการสัมผัสเชื้อเอชไอวีอย่างสม่ำเสมอของชายที่มีเพศสัมพันธ์กับชายในประเทศไทย : การศึกษาแบบตัดขวาง

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บทคัดย่อ : การติดเชื้อเอชไอวีในกลุ่มชายที่มีเพศสัมพันธ์กับชายมีแนวโน้มเพิ่มขึ้น โดยยาต้านไวรัสก่อนการสัมผัสเชื้อเป็นกลยุทธ์ในการป้องกันที่มีประสิทธิภาพ อย่างไรก็ตาม งานวิจัยที่ศึกษาเกี่ยวกับพฤติกรรมการใช้ยาต้านไวรัสก่อนการสัมผัสเชื้อในกลุ่มดังกล่าวในประเทศไทยยังมีอยู่อย่างจำกัด การศึกษาแบบตัดขวางนี้ มีวัตถุประสงค์เพื่อศึกษาปัจจัยทำนายพฤติกรรมการใช้ยาต้านไวรัสก่อนการสัมผัสเชื้อเอชไอวีของชายที่มีเพศสัมพันธ์กับชายในภาคตะวันออกเฉียงเหนือของไทย กลุ่มตัวอย่างคือ ชายที่มีเพศสัมพันธ์กับชาย จำนวน 128 คน สุ่มกลุ่มตัวอย่างแบบหลายขั้นตอน รวบรวมข้อมูลผ่านระบบออนไลน์ โดยใช้แบบสอบถามเกี่ยวกับการใช้ยาต้านไวรัสก่อนการสัมผัสเชื้อเอชไอวี ได้แก่ แบบวัดข้อมูลส่วนบุคคล แบบวัดความรู้เกี่ยวกับการใช้ยา แบบวัดทัศนคติต่อการใช้ยา แบบวัดการตีตราจากการใช้ยา แบบวัดการรับรู้โอกาสเสี่ยงต่อการติดเชื้อเอชไอวี แบบวัดการรับรู้สมรรถนะแห่งตนในการใช้ยา และแบบวัดพฤติกรรมการใช้ยา เก็บรวบรวมข้อมูลระหว่างเดือน ตุลาคม พ.ศ. 2566 ถึง สิงหาคม พ.ศ. 2567 วิเคราะห์ข้อมูลด้วยสถิติพรรณนา ความสัมพันธ์แบบไบซีเรียล และวิเคราะห์การถดถอยโลจิสติกแบบไบนารี

ผลการวิจัย พบว่ากลุ่มตัวอย่างมีพฤติกรรมการใช้ยาต้านไวรัสก่อนการสัมผัสเชื้อเอชไอวีอย่างสม่ำเสมอร้อยละ 39.80 ตัวแปรที่มีความสัมพันธ์กับพฤติกรรมการใช้ยาต้านไวรัสก่อนการสัมผัสเชื้อเอชไอวีคือ ทัศนคติต่อการใช้ยา การตีตราจากการใช้ยา และการรับรู้โอกาสเสี่ยงต่อการติดเชื้อเอชไอวี มีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติ ตัวแปรทัศนคติต่อการใช้ยา และการรับรู้โอกาสเสี่ยงต่อการติดเชื้อเอชไอวี สามารถร่วมทำนายพฤติกรรมการใช้ยาต้านไวรัสก่อนการสัมผัสเชื้อเอชไอวีอย่างสม่ำเสมอของชายที่มีเพศสัมพันธ์กับชายได้ร้อยละ 41.80 พยาบาลและบุคลากรทางการแพทย์อื่น ๆ อาจนำผลการวิจัยนี้ไปประยุกต์ใช้ในการพัฒนาโปรแกรมที่ส่งเสริมทัศนคติเชิงบวก ลดการตีตรา และเพิ่มการรับรู้ความเสี่ยงต่อการติดเชื้อเอชไอวี ซึ่งจะช่วยเพิ่มการใช้ยาต้านไวรัสก่อนการสัมผัสเชื้อในกลุ่มชายที่มีเพศสัมพันธ์กับชายที่มีความเสี่ยงสูง การวิจัยในอนาคตควรศึกษาปัจจัยอื่น ๆ เพิ่มเติม เช่น สื่อและการรณรงค์ในชุมชน การสนับสนุนจากคู่รัก การเข้าถึงสถานบริการทางการแพทย์ และทัศนคติของผู้ให้บริการทางการแพทย์ต่อกลุ่มนี้ เพื่อให้เข้าใจการใช้ยาต้านไวรัสก่อนการสัมผัสเชื้อได้ดียิ่งขึ้น

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คำสำคัญ : การติดเชื้อเอชไอวี ชายที่มีเพศสัมพันธ์กับชาย ยาต้านไวรัสก่อนการสัมผัสเชื้อเอชไอวี พฤติกรรมการใช้ยาต้านไวรัสก่อนการสัมผัสเชื้อเอชไอวี ปัจจัยทำนาย ประเทศไทย

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