

ปัจจัยทำนายความตั้งใจในการใช้ยาป้องกันก่อนการสัมผัสเชื้อเอชไอวี ของกลุ่มเยาวชนชายที่มีเพศสัมพันธ์กับชาย จังหวัดชลบุรี Predictors of the Intention to Use Pre-exposure Prophylaxis among Young Men Who Have Sex with Men in Chonburi Province, Thailand

นิพนธ์ต้นฉบับ

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Original Article

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บทคัดย่อ

วัตถุประสงค์: เพื่อศึกษาความตั้งใจและปัจจัยที่สามารถร่วมกันทำนายความตั้งใจในการใช้ยาป้องกันก่อนการสัมผัสเชื้อเอชไอวี (PrEP) ของเยาวชนชายที่มีเพศสัมพันธ์กับชาย **วิธีการศึกษา:** การศึกษาเชิงทำนายมีกลุ่มตัวอย่างคือ เยาวชนชายอายุ 18 – 24 ปี จังหวัดชลบุรี จำนวน 293 คน สุ่มตัวอย่างแบบสะดวก เป็นลูกโซ่ เครื่องมือที่ใช้เป็นแบบสอบถามที่ตอบด้วยตนเองผ่านระบบออนไลน์ (Google form) ประกอบด้วยข้อมูลส่วนบุคคล ความรู้เกี่ยวกับยา PrEP ทศนคติต่อการใช้ยา PrEP การคล้อยตามกลุ่มอ้างอิงในการใช้ยา PrEP การรับรู้ความสามารถของตนเองในการใช้ยา PrEP และความตั้งใจในการใช้ยา PrEP ทดสอบความสัมพันธ์ด้วยการวิเคราะห์ถดถอยพหุคูณแบบขั้นตอน **ผลการศึกษา:** เยาวชนชายที่มีเพศสัมพันธ์กับชายมีความตั้งใจในการใช้ยา PrEP โดยรวมในระดับสูง (คะแนนเฉลี่ย = 21.0 ± 6.30 จาก 30 คะแนน) พบว่าการใช้ถุงยางอนามัย ($\beta = -0.218$) การรับรู้ความสามารถของตนเอง ($\beta = 0.149$) จำนวนคู่นอน ($\beta = 0.173$) และทัศนคติต่อการใช้ยา PrEP ($\beta = 0.130$) ร่วมกันทำนายความตั้งใจในการใช้ยา PrEP ได้ร้อยละ 11.6 (adjusted $R^2 = 0.116$) อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.05 **สรุป:** การใช้ถุงยางอนามัย การรับรู้ความสามารถของตนเอง จำนวนคู่นอน และทัศนคติต่อการใช้ยา PrEP ร่วมกันทำนายความตั้งใจในการใช้ยา PrEP ผลการศึกษาอาจใช้เป็นแนวทางพัฒนาโปรแกรมส่งเสริมการใช้ยา PrEP ในกลุ่มเยาวชนชายที่มีเพศสัมพันธ์กับชาย ที่เน้นการสร้างทัศนคติที่ดีและการรับรู้ความสามารถของตนเอง และเน้นกลุ่มที่ใช้ถุงยางอนามัย

คำสำคัญ: ชายที่มีเพศสัมพันธ์กับชาย; ความตั้งใจในการใช้ยา PrEP; การรับรู้ความสามารถของตนเอง; ทัศนคติ: ยาป้องกันก่อนการสัมผัสเชื้อเอชไอวี

Abstract

Objective: To identify level of the intention to use PrEP and associations with its influencing factors among Thai young men who have sex with men (MSM). **Method:** In this predictive research, participants were 293 Thai young MSM aged 18 - 24 years old in Chon Buri province. Respondent driven sampling technique was used to draw the sample. The research instrument was a self-report e-questionnaire on Google form. The questionnaires consisted of personal information, knowledge of PrEP, attitudes towards PrEP, normative beliefs of PrEP, and PrEP self-efficacy. The associations were tested using stepwise multiple regression analysis. **Results:** The intention to use PrEP was at a high level (mean score = 21.0 ± 6.30 out of 30 points). The predictors of intention to use PrEP were condom use ($\beta = -0.218$), PrEP self-efficacy ($\beta = 0.149$), number of sexual partners ($\beta = .173$) and attitudes towards PrEP ($\beta = .130$). Those factors explained 11.6% of the variance of the intention to use PrEP (adjusted $R^2 = 0.116$, P-value < 0.05). **Conclusion:** The intention to use PrEP were associated with condom use, PrEP self-efficacy, number of sexual partners, and attitudes towards PrEP The results serve as a guideline for developing programs to promote the use of PrEP among young MSM focusing on enhancing attitudes towards PrEP and PrEP self-efficacy, and those who used condom.

Keywords: men who have sex with men, intention to use PrEP, self-efficacy; attitude; pre-exposure prophylaxis drugs

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Introduction

According to the 2021 World Health Organization (WHO) report on HIV infection and AIDS, of the 38.4 million individuals infected, 1.5 million individuals were newly infected. Of these newly infected, the majority were men who have sex with men (MSM).¹ In Thailand, young people especially those 15 – 24 years of age have an increasing risk of HIV infection. In 2021, 3,205 newly infected cases were reported.² MSM had a higher risk of HIV infection compared with other high-risk

groups accounting for 62% of the newly infected cases in 2021.² The proactive measures to prevent and control HIV infection and AIDS among MSM are of great importance.

There have been policies and plans to halt HIV newly infected cases which are consistent with the national strategies to end AIDS (2017 – 2030). The first strategy was to provide an effective program for all high-risk populations with the concept of access or reaching out, recruitment for test

and treatment, and the retention of the infected individuals in the program known as the Reach-Recruit-Test-Treat-Retain (RRTTR) initiative. The goals of 95% of infected individuals realizing their HIV status, 95% of the infected individuals receiving the treatment, and 95% of the treated individuals achieving HIV control were expected to achieve in 2030.³

Despite a progress in providing care to high-risk groups including MSM, transgenders, sex industry freelancers, and intravenous drug users, the goals of 95-95-95 might not be achieved. The national AIDS prevention committee issued the use of anti-retroviral drugs for the prevention of HIV infection known as Pre-Exposure Prophylaxis (PrEP) as an effective preventive measure for high-risk populations nationwide. The regimen of tenofovir disoproxil fumarate (TDF) 300 mg and emtricitabine (FTC) 200 mg in a combination pill, 1 tablet once daily could prevent sexually transmitted HIV infection by 90%.⁴

The target groups of PrEP include MSM as the highest risk of sexual transmission followed by transgenders, partners of the infected individuals with no condom use, individuals with PrEP regular use, male and female sex workers, individuals with sexually transmitted disease in the last 6 months, and IVDUs. MSM is the most concerned group since they have the riskiest sexual behavior for HIV infection.³ Despite the availability of PrEP nationwide, the success of the provision depends largely on the intention of the young MSM to use which warrants a thorough understanding.

Understanding the intention to use PrEP among young MSM is crucial for the promotion of HIV infection; however, studies on the issue have been scarce.⁵⁻¹⁹ Two studies in Thai population were in MSM not specific to young men and only determined level of the intention to use PrEP not the associations between the intention and related factors. Thus, there is a need for more understanding on the intention to use PrEP among young MSM.

This present study aimed to determine the intention to use PrEP among young MSM with a risk of HIV infection. The intention to carry out a given behavior indicates the readiness to cultivate the behavior. There has been evidence suggesting that the intention is the best predictor of the behavior. The Integrative Model of Behavioral Prediction (IMBP) was used as the conceptual framework.²⁰ A set of comprehensive predictive factors include predisposing factors (i.e., education, number of partners, sexually transmitted diseases acquired, condom use, and PrEP knowledge), and attitude factors

influencing PrEP use (i.e., subjective norms and self-efficacy in PrEP use). The results help better understand the intention to use PrEP and the association between the intention and various factors. In the future, a program to promote the primary prevention of HIV infection could be developed for young MSM. Specifically, this study aimed to determine the level of the intention to use PrEP and the associations of the intention with its predicting factors among Thai young MSM.

Conceptually, the framework was developed as suggested by the Integrative model of behavioral prediction (IMBP)²⁰ and literature review to acknowledge both direct and indirect influencing factors of the intention to use PrEP. These factors include the individuals' intention to perform a given behavior depends on attitudes towards behaviors, the perceived outcomes/benefits of performing the behavior, subjective norms which is the influence of the role model persons whether the individuals should or should not perform the behavior, and self-efficacy which is the individual's belief in their ability to carry out the behavior. Hence, for the intention to use PrEP, the direct factors included attitudes towards behaviors, subjective norms and self-efficacy, and predisposing factors which were the indirect ones included education, knowledge about PrEP, number of partners, sexually transmitted disease status, and condom use among Thai young MSM.

Methods

In this predictive research, study population was Thai men aged 18 – 24 years who had sex with men only, acting masculine, having oral and/or anal sex, and resided in Chonburi province, Thailand. The study sample was 352 individuals in the study population who met the eligibility criteria. To be eligible, the individuals had to have sex with men in the last 6 months, have a self-reported HIV negative status, never have HIV test or have the test with negative result or have no known HIV status, and have mobile phone with the function to fill the questionnaire on the Google Form. Those who had PrEP were excluded.

The sample size was estimated using the software program G*POWER. The sampling error of 0.05 and a power of test of 0.95 were set. The effect size was set at 0.08 since most nursing studies were usually with a low effect size (i.e., 0.02 – 0.13).²¹ For the eight independent variables, a sample

size of 293 participants was needed. To compensate for 20% incomplete data²², 352 participants were needed.

With unique characteristics of and the difficult access to the participants, respondent driven sampling (RDS) was used for recruitment.²³ The first batch of 14 participants was recruited from places in Chonburi province where MEM met. Each of these 14 participants was asked to introduce 5 new young MSM. This first round of sample recruitment propagation resulted in accumulating another 70 participants. Each of the 70 participants was asked to introduce to 4 participants resulting in another 268 participants. Therefore, a total of 352 participants were recruited and the online survey was stopped. The limited number of introducing not more than 5 new prospective participants was to prevent biased sampling of participants with characteristics too close to each other. Once the target number of participants was reached, no participants could access the online survey.

Research instruments

The questionnaire contained 7 parts. The **first part** collected demographic characteristics including age, education, education, and income. The **second part** assessed sexual behavior including number of sexual partners, type of present sexual partner, and history of sexually transmitted disease. In addition, a single question asked about regularity of condom use in the past six months with a visual analog scale of ten 10-point intervals from 0 – 10% to 91 – 100%. The score of 1 to 10 points was rewarded.

The **third part** assessed the knowledge about PrEP in MSM including how to use, indication, contra-indication, mechanism of action, and side effects. The 18 questions were developed by the researchers. The response was true, false and not sure. A score of 1 point was rewarded for correct answer and 0 for incorrect one and not sure. With the possible total score of 0 – 18 points, higher scores indicate higher level of knowledge about PrEP.

The **fourth part** asked about the attitude toward PrEP use. The 13 questions of positive and negative feelings, thoughts, beliefs and opinions towards PrEP in young MSM were modified from the questionnaire of Wang.²⁴ The response was a 4-point Likert-type scale ranging from 1-strongly disagree, to 2-disagree, 3-agree, and 4-strongly agree for positive statements. Scores of negative statements were reversed.

With the possible total score of 13 – 52 points, higher scores indicate more positive attitude toward PrEP use.

The **fifth part** evaluated the subjective norms for PrEP use. The questions rated how much the young MSM perceived support in using PrEP significant ones including family members, partners/lovers, and close friends. The three questions were developed by researchers. The response was a 4-point Likert-type rating scale ranging from 1-the least supportive, to 2-less supportive, somewhat supportive, and 4-the most supportive. With the possible total score of 3 – 12 points, higher scores indicate higher level of subjective norms.

The **sixth part** assessed self-efficacy in PrEP use. The young MSM were asked to rate how confident they were in using PrEP in obstructive or difficult situations. The 10 questions were modified from the work of Qu.¹⁵ Response was a 4-point Likert-type rating scale ranging from 1-not at all confident, to 2-slightly confident, 3-a lot confident, and 4-the most confident. With the possible total score of 10 – 40 points, higher scores indicate higher level of self-efficacy in PrEP use.

The **seventh part** evaluated the intention to use PrEP. The questions asked about expectation, needs, and intention to use PrEP in the next 6 months. The three questions were modified from the work of Glanz.²⁵ For each question, the intention was rated on a visual scale of 1 to 10 points where 10 indicating highest intention and 1 the least intention with the possible total score of 10 – 30 points.

Instrument quality assurance

Content validity of the questionnaire was examined by five experts in nursing care and psychology. The questions were found to have good content validity with the content validity index for attitude, subjective norms, self-efficacy, intention to use, and knowledge about PrEP of 1.00, 1.00, 1.00, 0.80 and 0.94, respectively. The revised version was tested for internal consistency reliability in 30 individuals with characteristics comparable to the participants. The questions of for attitude, subjective norms, self-efficacy, and intention to use were found to have acceptable to high internal consistency reliability with Cronbach's alpha coefficients of 0.76, 0.94, 0.89, and 0.96, respectively. Questions about knowledge also had acceptable internal consistency reliability with a KR-20 coefficient of 0.75.

Participants ethical protection

The study was approved by the Ethics Committee for Human Study of Burapha University (approval number: G-HS 076/2564; approval date: December 21, 2021). The implied consent was allowed. Upon online access to the survey, the researcher provided information about the objectives, process, and voluntary and confidential nature of the study. Participants could withdraw from the study at any time with no negative consequences in any services.

Data collection procedure

The prospective participants were approached at the Sisters Foundation Center for Transgender, Swing Pattaya Medical Technique Clinic, and gathering places of young MSM. Eligible participants were asked to contract other potential individuals as described previously. Online links were available for survey completion on Google Form™.

Data analysis

Descriptive statistics was used to summarize demographic characteristics and behavioral variables of the participants.

Hence, for the intention to use PrEP, the direct factors included attitudes towards behaviors, subjective norms and self-efficacy, and predisposing factors which were the indirect ones included education, knowledge about PrEP, number of partners, sexually transmitted disease status, and condom use among young MSM. The predictive factors of independent variables on the intention to use PrEP was tested using stepwise multiple regression analysis. The direct factors included attitudes towards behaviors, subjective norms and self-efficacy while predisposing factors (i.e., indirect factors) included education, knowledge about PrEP, number of partners, sexually transmitted disease status, and condom use. All assumptions for multiple regress analysis were met. Statistical significance was set at a type I error of 5%. All statistical analyses were conducted using the software program SPSS 20.

Results

Of the 293 participants, they were 21.3 ± 1.87 years old by average. About half of the participants had bachelor's degree education (48.8%). The majority of participants were students (34.8%) followed by labors (24.2%). The majority had monthly income in the range of 10,001 - 15,000 baht (38.6%)

with the lowest and highest income of 4,000 and 50,000 baht, respectively, and an average income of $14,574.1 \pm 6,913.54$ baht.

The majority of young MSM were active/top sexual preference (40.6%) followed by both (active and passive) (33.6%), and passive/bottom (25.8%). Most had 1 – 3 sexual partners (44.3%), followed by 4 – 6 partners (25.8%). In the past 6 months, they had 1 sexual partner (66.9%). Present sexual partners were lovers (64.5%). Most had no history of sexually transmitted diseases (90.8%). They used condom 91 – 100% of the time of sexual intercourse (28.0%), followed by 91 – 100% (28.0%) and 61 – 70% (13.7%).

For the behavioral factors, the intention to, attitude toward, subjective norms toward, and self-efficacy in the use of PrEP were at a relatively high level (mean = 21.0 ± 6.30 , 39.7 ± 5.42 , 9.8 ± 1.31 , and 30.6 ± 4.58 points, respectively); while knowledge about PrEP was at a low level (mean = 11.2 ± 3.83 points) (Table 1).

Table 1 Mean scores of the intention to use PrEP and its predictive factors (N = 293).

Factors	Possible range	Actual range	Mean	SD
Knowledge about PrEP	0 - 18	4 - 18	11.2	3.83
Attitude toward PrEP use	13 - 52	25 - 52	39.7	5.42
Subjective norms toward PrEP use	3 - 12	5 - 12	9.8	1.31
Self-efficacy in PrEP use	10 - 40	16 - 40	30.6	4.58
Intention to use PrEP	3 - 30	3 - 30	21.0	6.30

Based on multiple regression analysis, condom use ($\beta = -0.218$), self-efficacy ($\beta = 0.149$), number of partner ($\beta = 0.173$), and attitude toward PrEP use ($\beta = 0.130$) significantly, jointly predicted the intention to use PrEP (P-value < 0.05) with 11.6% of the variance of the intention to use PrEP explained (adjusted $R^2 = 0.116$) (Table 2).

Table 2 Associations between the intention to use PrEP and its predictive factors based on multiple regression analysis (N = 293).

Factors	b	S.E.(b)	β	t	P-value
Condom use	-0.477	0.127	-0.218	-3.765	< 0.001
Self-efficacy in PrEP use	0.205	0.084	0.149	2.451	0.015
Number of partners	2.319	0.742	0.173	3.125	0.002
Attitude toward PrEP use	0.152	0.071	0.130	2.124	0.034
Constant	11.314	3.092	-	3.659	< 0.001

$R^2 = 0.128$, adjusted $R^2 = 0.116$, $F = 4.513$, P-value = 0.034.

Discussions and Conclusion

In this predictive research in Thai young MSM aged 18 – 24 years old, the intention to use PrEP in the next 6 months was at a relatively high level (mean = 21.0 points). This is consistent with studies in MSMs in China where the intention to use PrEP was also high.^{24,26} This could be because more than 60% of the participants were older than 20 years old which is the late teenagers. Individuals of this age are considered to start developing the thinking process, freedom of decision making, understanding, self-confidence, and realization on long-term effects of their own action. They use these recently developed positive traits in deciding to perform the behavior.²⁷ With a more widespread promotion of PrEP in the high-risk population with no expenditure needed, it could be the reason of a high level of the intention to use.

For the predictive factors based on the IMBP theory, condom use, self-efficacy, number of sexual partners, and attitude toward the use of PrEP significantly predicted the intention to use PrEP. Condom use was the most negative influence factor determining PrEP use. The participants who used condom more frequently could be ensured that condom use certainly protected them from sexually transmitted disease especially HIV infection.²⁸ With such positive actual experience with the condom, young MSM using condom regularly were confident in the condom which in turn negatively lower their intention to use PrEP. On the other hand, participants who did not use condom regularly could realize the risk of HIV infection and the need for PrEP. As a result, their intention to use PrEP could be heightened. This finding is consistent with a study showing that gay men with irregular use of condom within the past 6 months had a higher level of the intention to use PrEP when compared with those with regular condom use.²⁹ In addition, gay men with irregular condom use in the last 3 months showed a higher intention to use PrEP than those who used condom regularly.³⁰

Perceived behavioral control was positively predictive of the intention to use PrEP. This is because self-efficacy is the individuals' confidence that they are capable in carrying out the behavior for the expected outcomes before the action. The more confident they are, the more chance they perform the behavior.³¹ Our finding is consistent with previous studies demonstrating that MSMs with self-efficacy in PrEP use had a higher intention to use it than those with a low control.^{18,32}

The number of partners was a significant predictive factor of HIV infection. Young MSM had various kinds of sexual partners, specifically 64.5% were lovers while 35.1% were friends, 29.0% were acquainted people, 25.8% were people meeting in bars, and 10.0% were sex workers. Young MSM with multiple sexual partners could have realized the risk of HIV infection so they could have a higher intention for PrEP use. This finding is consistent with previous studies where young MSM with multiple sexual partners had more intention to use PrEP compared with those with fewer sexual partners.^{30,32}

The attitude toward PrEP use is the person's positive and negative belief, feeling and opinion influenced by perception and experience. The attitude affected the decision and determination to carry out the behavior.³³ Young MSM with positive attitude, thought and belief that PrEP would benefit them in preventing HIV infection would have an intention to use PrEP. For individual items of the attitude toward PrEP use, more than 45% of young MSM highly agreed that using PrEP would allow them to have safe sex, be responsible to themselves and the partners in preventing HIV infection, alleviate anxiety, and maintain quality of life. However, about 20% of them had a negative attitude toward PrEP use. For example, PrEP use could harm health, have others misunderstood them as improper sexual behaviors or being infected with HIV, and cost more. Our finding is consistent with previous overseas studies where MSMs with positive attitude toward PrEP use and the belief that PrEP is effective in preventing HIV had a high level of intention to use PrEP.^{18,26}

Certain factors could not predict the intention to use PrEP in young MSM including education, PrEP use knowledge, history of sexually transmitted disease, and subjective norms. For education, since most participants were in their undergraduate study years (80.7%), inadequate variability of education might not allow for statistically significant association with the intention.

For knowledge about PrEP use, the average score was relatively low. Knowledge about HIV prevention could be acquired from various sources out of formal education such as the Internet and social media provided by hospitals and clinics, as well as friends. However, information about PrEP might not be widely known among young MSM as seen with a relatively low average

knowledge score. This could result in no difference in the intention to use PrEP regardless of level of knowledge.

History of sexually transmitted disease was not significantly associated with the intention to use PrEP. Since they were young individuals of 18 – 24 years of age, most of them had no history of sexually transmitted disease (90.7%); while those who did had mild diseases. This could result in a low concern for perceived severity of HIV and sexually transmitted disease. For subjective norms, it was found to not have a significant relationship with the intention to use PrEP. The majority were 20 years old or older, had a bachelor's degree, and had job; hence, they had a goal in life, developing identity, and confidence. They thus could make their own judgment regardless of the influence from their significant others on the intention to use PrEP.

This study has certain limitations. With the cross-sectional design, the cause-effect relationship between the intention to use PrEP and various factors could be somewhat limited. Since the participants were drawn from young MSM in Chonburi province, generalization to those nationwide should be cautious.

Our findings could be used for guiding behavioral modifications among Thai young MSM. The most intriguing aspect was about the misunderstanding on PrEP use such as long-term use of PrEP could harm health, make others think they have improper sexual behavior or are infected with HIV, and cost more. Relevant agencies should promote self-efficacy among young MSM through the actual experience of proper use of PrEP, indirect experience through role model, motivation on PrEP use, and consultation for PrEP use. The intervention could help reduce anxiety from PrEP use. The agencies should also pay attention to young MSM who used condom since they were somewhat over-confident they were well protected from HIV infection. In reality, condom does not offer 100% protection if not wearing properly.

For future research, since only the intention to use PrEP was studied, more studies on the actual behavior of PrEP use in young MSM should be conducted. Other high-risk groups, such as sex workers and transgenders should also be studied. In this study, a limited number of factors predicted only 11.6% of the variance of the PrEP use intention. More factors influencing the PrEP use intention including access to PrEP

and PrEP costs should be studied. Lastly, programs to foster the intention to use PrEP should be developed for young MSM. The program could enhance the positive attitude toward PrEP use and develop the skills necessary for strengthening the self-efficacy in PrEP use.

In conclusion, Thai young MSM had a relatively high intention to use PrEP (mean = 21.0 ± 6.30 out of 30 points). The intention to use PrEP was significantly predicted by condom use, self-efficacy to use PrEP, number of sexual partners, and attitude toward PrEP use. The four factors together explained 11.6% of the variance of the intention to use PrEP (adjusted $R^2 = 0.116$, P -value < 0.05).

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