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Pre-exposure prophylaxis uptake for HIV infection prevention among young men who have sex with men and transgender women in Bangkok, Thailand

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Abstract

Purpose – The purpose of this study aimed to assess factors associated with the intention to take pre-exposure prophylaxis (PrEP) among Thai young men who have sex with men (YMSM) and transgender women (TGW) in Bangkok.

Design/methodology/approach – The study surveyed 350 sexually active Thai YMSM and TGW aged between 18 and 24 years registered with a nongovernmental organization (NGO) working with the MSM community. Data were collected using snowball sampling from four venues. Participants completed a self-administered questionnaire. Logistic regression was used to evaluate factors associated with the intention to take PrEP daily.

Findings – The results showed that of all those surveyed, $n = 310$ (88%) participated. The median age was 21 years. In all, 18% of participants had heard about PrEP, and 36% correctly identified that PrEP is used for prevention. After receiving information, 31% intended to take daily PrEP and the Voluntary Counseling and Testing (VCT) rate was 35.5%. Factors significantly associated with intention to take daily PrEP were history of HIV testing (adjusted odds ratio (AOR), 2.3, 95% CI, 1.3–4.1), and high perceived behavioral control of PrEP adherence scores (AOR 3.0, 95% CI, 1.8–5.2).

Originality/value – This study showed that intention to take and knowledge of daily PrEP among YMSM and TGW was low. Promoting health education to YMSM and TGW about PrEP and MSM-friendly VCT services are needed to effectively implement PrEP in HIV prevention programs.

Keywords Pre-exposure prophylaxis, MSM, Transgender women, HIV prevention

Paper type Research paper

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Introduction

The World Health Organization (WHO) with cooperation from the international community has implemented measures to prevent HIV transmission including treatment services for people living with HIV/AIDS (PLHIV) and new HIV infections over the past 30 years. These efforts have resulted in reducing the percentage of HIV infection in several regions worldwide [1, 2]. However, among some specific populations such as men who have sex with men (MSM), the incidence of new infections has continued to increase, especially among 18–24-year-old young men who have sex with men (YMSM) who have a tendency toward high-risk behaviors [3, 4]. The factors contributing to these behaviors included in consistent condom use when having sex, having multiple sexual partners at a time and frequently having casual sex. These factors may increase the risk of transmitting HIV. Studies have shown that the annual incidence of HIV infection among YMSM was as high as 9 of 100 in the population [5, 6]. Evidence shows that taking pre-exposure prophylaxis (PrEP) can prevent HIV exposure and reduce HIV incidence among YMSM [7]. However, several studies have reported the rate of adherence and acceptability (willingness) to take PrEP was still low (35–39%) [8, 9] partly due to a lack of awareness about the use of PrEP. As of January 2020, the Thailand Health Security Office (NHSO) piloted free PrEP to at-risk groups in 21 of Thailand's 76 provinces. PrEP was only previously available from MSM-friendly sources [10] despite the incidence of HIV among MSM in the Bangkok Metropolitan Area being ranked the highest in Southeast Asia [5, 11]. No studies have been conducted using the theory of planned behavior [12] in measuring factors associated with intention to use PrEP among YMSM and TGW particularly in the Thai context. This study aimed to investigate factors associated with the intention to use PrEP for HIV among YMSM and TGW in the Bangkok Metropolitan Area.

Methodology

Design and participants

This cross-sectional study was conducted from February to April in 2015 involving 310 participants at four venues including university (1) compound, (2) pubs, bar, massage parlors, (3) spa and sauna public parks and (4) an NGO working with the MSM community in Bangkok, Thailand. The eligibility criteria of the study were male (by birth), aged from 18 to 24 years, HIV negative men and transgender women practicing either insertive or receptive anal sex during the past three months, ability to understand and read Thai, and residing in the Bangkok Metropolitan Area for at least two months. Individuals exhibiting communication problems were excluded from this study.

Sampling and sample size

The sample size was calculated using the Epi Info (centers for disease control and prevention) Sample Size Program requiring a proportion of acceptance of PrEP to prevent HIV of approximately 40% [8], 95% confidence level and 5% tolerance. A total of 350 individuals were recruited but the final analysis included 310 who provided complete data.

Data collection

The questionnaire used to collect data in this study was modified from two studies [8, 9], and consisted of nine parts: (part 1) socio-demographic characteristics (age, education and sexual orientation), (part 2) perceived risk of HIV transmission (knowing of PrEP as a new way to prevent HIV infection), (part 3) knowledge of PrEP (information about the perceived effectiveness of PrEP), (part 4) sexual behaviors (history of narcotic intake and intoxication, frequency of visiting sexual servicing establishments, Internet searching partner, (part 5) history of HIV testing and history of sexually transmitted infections (STIs), (part 6,7,8) construct of the theory of planned behavior composed of attitudes toward PrEP, subjective

norms to influence taking PrEP and perceived behavioral control of PrEP adherence and (part 9) intention to take PrEP (frequency of intention to take medicine (Truvada) daily).

The questionnaires were validated by pretesting in this study. The Cronbach's alpha coefficient of the questionnaire for knowledge, attitudes, subjective norms and perceived behavioral control for taking daily PrEP equaled 0.806, 0.721, 0.847 and 0.699, respectively. The duration for completing the questionnaire was 20–30 min for each participant in a private room at the respective sites.

Variables

The variables were as follows: socio-demographic characteristics, perceived risk for HIV transmission, information about PrEP, knowledge regarding the effectiveness of PrEP, sexual behaviors, attitudes toward PrEP, subjective norms about taking PrEP and perceived behavioral control in taking daily PrEP. The dependent variable was the intention to take PrEP among YMSM and TGW. The definitions of these variables are listed below [13–15].

(1) Socio-demographic characteristics refer to age, education (no schooling, primary and secondary school level, diploma and bachelor's degree level or higher) and sexual orientation (YMSM and TGW with hormone use and without hormone use).

(2) The perceived risk of HIV transmission refers to the interval scale of the awareness of HIV risks and issues of stigma in society.

(3) PrEP awareness refers to the knowledge of PrEP as a new way to prevent HIV infection for people at risk who do not have HIV infection.

(4) Knowledge of PrEP to prevent HIVcovers the interval scale information about the perceived effectiveness of PrEP.

(5) Sexual behaviors were defined as a history of narcotic intake and intoxication; e.g. methamphetamine, amphetamine, ecstasy, etc., frequency of visiting sexual servicing establishments in the past three months, Internet searching partner and history of HIV testing and diagnosis of STIs in the past six months.

(6) Attitudes toward PrEP for HIV transmission refers to the interval scale of personal feelings and opinions expressed concerning the effectiveness of PrEP in preventing HIV, safety, side effects, convenience and efficiency of PrEP to prevent HIV, and being stigmatized by society about taking PrEP.

(7) Subjective norms to influence taking PrEP refers to the interval scale of family members (couples, father, mother, siblings), friends, doctors or nurses that influence individuals to take daily PrEP to prevent HIV.

(8) Perceived behavioral control of PrEP adherence refers to the interval scale of the confidence among the participants to take antiviral drugs daily to prevent HIV transmission from their sexual partner.

(9) Intention to take PrEP to prevent HIV was defined as the frequency of intention to take medicine (Truvada) daily to prevent HIV.

Data analysis

Descriptive analysis (number, percentage, mean and standard deviation) was used to describe the demographic data of the participants and analytical statistics (chi-square test, binary logistic regression, odds ratio and 95% confidence interval) were used to draw

conclusions about the specific sample data. The investigators analyzed factors associated with the intention to take PrEP among YMSM and TGW and assumed that participants were HIV negative or were HIV status unknown. Prior to the survey, the participants were informed that PrEP should be taken daily to maximize the benefit of HIV PrEP even though PrEP taken at least four days per week may be as effective as daily PrEP [16]. Intention to take PrEP was assessed by dichotomizing the responses to the questions "If daily use of PrEP was proved to be effective to prevent HIV infection and safe to use, how frequently do you think you would take the drug on aweekly basis?" Response options were "Not at all", "daily", "1–3 days weekly" or "4–6 days weekly" and only daily was counted as the intention to take PrEP (30.6%, $n = 95$) which was later used for binary regression. The investigators used proportions to describe socio-demographic characteristics and sexual behaviors. Variables associated with intention to take PrEP daily with a $p \leq 0.10$ using univariable logistic regression were included in multivariable analysis. Statistical significance was evaluated using a two-sided $p < 0.05$. All analyses were performed using STATA® (Version 12, 2011; Stata Corp., College Station, TX, USA).

Ethical consideration

The study protocol was approved by the Ethics Review Committee for Human Research, Faculty of Public Health, Mahidol University (Number MUPH 96/2562).

Results

Table 1 shows that 50% ($n = 155$) of participants were aged 18–20 years; and 50% ($n = 155$) were aged 21–24 years, 60.6% ($n = 188$) had completed upper secondary level of education (Grade 12) and 30.3% ($n = 94$) studied to higher education level. The sexual orientation of participants was 88.4% ($n = 274$) YMSM and 11.6% ($n = 36$) TGW. In the past, only 12.9% ($n = 40$) of participants reported narcotic intake and 32.6% ($n = 101$) occasionally took narcotics and intoxication up to the loss of control. The majority of participants, 60% ($n = 186$), had visited sexual service establishments. Nearly 45% ($n = 138$) of the sample had used the Internet to search for a partner; of those 64.5% ($n = 89$) had found a sexual partner online. Overall, 30.6% ($n = 95$) of participants reported that they would take PrEP daily.

Table 2 shows the majority of participants 74.2% ($n = 230$) had a moderate level of perceived risk of HIV transmission; only 16.1 % ($n = 50$) had a high level while 9.7% ($n = 30$) had a low level. Almost one half of YMSM and TGW in Bangkok 47.4% ($n = 147$) "Didn't know" about the availability of PrEP, followed by those who responded, "not sure" 34.5% ($n = 107$) while the least common were those who knew about information regarding antivirals 18.1% ($n = 56$). Most participants 89.7%) ($n = 278$) had a low level of PrEP knowledge, while the least common 7.1% ($n = 22$) were those having a moderate level and those 3.2% ($n = 56$) having a high level. Almost three-fourths, 71.3% ($n = 221$) of participants had a neutral attitude toward PrEP, while the least common 15.5% ($n = 48$) were those having a positive attitude toward PrEP and 13.2% ($n = 41$) were those having a negative attitude toward PrEP. More than two-thirds of participants ($n = 231$) reported that they expected a moderate amount of support from friends and family in taking PrEP daily. Less common were those who reported that they would have low or no support from family or friends in taking PrEP daily 18.4% ($n = 57$). About two-thirds, 63.5% ($n = 197$) of participants had a moderate level of perceived behavioral control to take PrEP daily while 33.9% ($n = 105$) had a low level.

Table 3 presents the binary regression analysis to identify influencing factors regarding the intention to take PrEP daily among YMSM and TGW in the Bangkok Metropolitan Area. The combination of "Not aware" and "Not sure", the combination of "Low" and "Moderate" level and "Never" was for the reference group in Binary applying the method of "Enter".

Demographic characteristic	Number	Percentage
Age (yrs)		
18–21	155	50
22–24	155	50
Mean(SD) = 21.48(1.8); Median = 21.5; Min = 18; Max = 24		
Education level		
Primary	11	3.5
Secondary	188	60.6
Vocational	17	5.5
Bachelor's degree or higher	94	30.3
Sexual orientation		
YMSM		88.4
TGW		11.6
Hormone use		77.8
No hormone use		22.2
History of narcotic intake		
Never	270	87.1
Yes	40	12.9
Narcotic intake and intoxication up to the loss of control		
Never	144	46.5
Occasionally	101	32.6
Seldom	39	12.6
Often	9	2.9
Regularly	17	5.5
Frequency of visiting sexual servicing establishments		
Never	124	40
Yes	186	60
Every week	60	19.4
Every month	50	16.1
Every 2–3 months	76	24.5
Internet to search for a partner		
Never	172	55.5
Yes	138	44.5
For sex	89	64.5
Not for sex	49	35.5
Intention to take PrEP		
Daily	95	30.6
Not daily (days)	215	69.4
4–6	44	14.2
1–3	46	14.8
Not at all	125	40.3

Table 1.
Socio-demographic characteristics (n = 310)

The selected variables for regression analysis included PrEP awareness, subjective norms to influence taking PrEP, perceived control of PrEP adherence, Internet searching partner, history of HIV testing and diagnosis of STIs during the past six months. The chi-square test indicated all these variables correlated with the intention to take PrEP daily among YMSM and TGW in the Bangkok Metropolitan Area ($p < 0.05$). Three factors (PrEP awareness, subjective norms to influence taking PrEP and Internet searching partner) found a collinearity of more than 0.8 and "PrEP awareness" was found to be most powerful. Binary logistic regression analysis showed two factors were associated with the intention to take

Factor	Number	Percentage
Perceived risk of HIV transmission		
High level (23–29 score)	50	16.1
Moderate level (16–22 score)	230	74.2
Low (9–15 score)	30	9.7
PrEP awareness		
Not aware	147	47.4
Not sure	107	34.5
Aware	56	18.1
Knowledge of PrEP to prevent HIV		
Good level (5–6 score)	10	3.2
Moderate level (4 scores)	22	−7.1
Low level (0–3 score)	278	89.7
Attitude toward PrEP for HIV transmission		
Positive attitude (33–41 score)	48	15.5
A neutral attitude (25–32 score)	221	71.3
Negative attitude (18–24 score)	41	13.2
Subjective norms to influence taking PrEP		
High support (1–25 score)	22	7.1
Moderate support (12–18 score)	231	74.5
Low support (5–11 score)	57	18.4
Perceived control of PrEP adherence		
High level (34–45 score)	8	2.6
Moderate level (22–33 score)	197	63.5
Low level (11–21 score)	105	33.9

Note(s): *Grouping used Max–Min/Range

Table 2. Perceived risk, knowledge, attitude, subjective norms and perceived behavioral

PrEP daily among YMSM and TGW in the Bangkok Metropolitan Area. The first was a history of HIV testing and the second was perceived control of PrEP adherence. The study found that YMSM and TGW having a history of HIV testing had a 2.3 times higher chance of developing their intention to take PrEP daily compared with those who never took the test (95% CI = 1.3–4.1). When possible confounding factors were adjusted and stabilized (PrEP awareness, knowledge of PrEP and subjective norms of PrEP), YMSM and TGW with a high level of perceived behavioral control of PrEP adherence would have a three times higher chance of developing the intention to take PrEP daily compared with those who had a low level of perceived behavioral control (95% CI = 1.8–5.2).

Discussion

In this study, low intention to take PrEP daily was revealed among participants (30.6%), whereas 40.3% reported "never" taking PrEP. Similarly, studies reported that male YMSM in Bangkok had the intention to take antiviral drugs at 39% [8] and 35% [9]. Both studies recruited participants aged 18 years and older and reported that age was a factor associated with HIV transmission. A study from the US conducted the year after PrEP approval found that only 1% of participants reported using PrEP despite 27% being aware of it [17]. Although not widely available, a 2018 study of PrEP uptake in Hong Kong found that 1% of participants had used PrEP. After being briefed about some facts of PrEP, the prevalence of willingness to use oral PrEP daily was 7.7% [16]. However, Gamarel and Golub [18] found that awareness did grow each year after PrEP approval in the US, including 56.7% of participants more likely to take PrEP in 2014. The study conducted by Dubov *et al.* [19]

Predicting factor	Intention to take PrEP number (%) $n = 95$	Bivariable analysis odds ratio (95% CI)	Multivariable analysis odds ratio (95% CI)
PrEP awareness			
Aware	27 (48.2)	2.8 (1.5–5.2) *	1.6 (0.9–3.1)
Not aware/Not sure (Rf)	68 (26.8)	1	1
Subjective norms to influence taking PrEP			
High Support	31 (54.4)	3.2 (1.5–6.6) ‡	Not included
Low-moderate support (Rf)	64 (25.3)	1	
Perceived behavioral to take PrEP daily			
High level	51 (48.6)	4.3 (1.5–12.3) ‡	3.0 (1.8–5.2) ‡
Low-moderate level (Rf)	44 (39.9)	1	1
Internet searching partner			
Yes	50 (36.2)	1.6 (1.0–2.6) *	Not included
Never (Rf)	45 (26.2)	1	
History of HIV testing			
Yes	58(43.9)	3 (1.8–4.9) ‡	2.3 (1.3–4.1) †
Never (Rf)	37(20.8)	1	1
Diagnosis of STIs in 6 months			
Yes	17 (48.6)	2.4 (1.2–4.9) †	1.4 (0.6–3.1)
Never	78 (28.4)	1	1

Note(s): *$p < 0.05$, †$p < 0.01$, ‡$p < 0.001$, OR = Odds ratios, CI = Confidence interval

Table 3. Factors associated with intention to take PrEP daily for HIV prevention

showed that PrEP uptake was extremely low among key groups. PrEP-related stigma and shaming are potential barriers to uptake. Besides, PrEP stigma significantly impedes PrEP acceptability, uptake, adherence and persistence as, to be named as an at-risk or high-risk group of HIV infection has negative stigma [20]. Therefore, the challenges of poor uptake among HIV-negative YMSM and TGW and possible increased sexual risk behaviors remain a concern.

Secondly, these results indicated that most participants had a moderate level of perceived behavioral control to take antiviral drugs daily (63.5%) and at low level (33.9%) while Intention to take PrEP was at only 30.6% which mean lower level of perceived behavioral control related to lower level of intention to daily PrEP uptake. This was consistent with a study conducted by Sithu Swe [21] who found that the sample group with self-care skills positively correlated with the decision and intention to prevent risky behaviors. Another study among HIV positive children and youths found that perceived behavioral control was related to self-care behaviors among HIV positive children and youths and perceiving the self-control ability to screen HIV positively correlated with the intention of HIV screening [22]. Also, the result from Hu *et al.* [23] indicated that MSM with more positive expectations regarding the efficacy of the drugs showed higher rates of medication. The study was also in line with that of Hu *et al.* [23] revealing that MSM with more positive expectations concerning the efficacy of the drugs showed higher medication rates ($p < 0.0001$), while those who were more worried about side effects had a lower medication rate ($p = 0.0208$). The confidence that the participants would take PrEP daily mattered in terms of increased effectiveness of PrEP to prevent HIV transmission, lower biological transmission and lower acquired risks from a sexual partner.

The current study suggested that the history of blood tests for HIV was significantly associated with the intention to take antiviral drugs. This was in line with the study conducted by Hu *et al.* [23] and studies conducted by Wheelock *et al.* [8] and Yang *et al.* [24] reporting that people with a history of detecting HIV and the frequency of detecting HIV had a high acceptance of antiviral drugs because the participants were aware of the risk of HIV. These factors would benefit health care service providers and those receiving services. Evidence showed that health care providers played an important role in educating risk groups on using PrEP before and after the blood test. Patients need to be aware of the risk of HIV transmission and ways to prevent the risk of HIV. The frequency of sexual intercourse among MSM in the past six months was about 86 and 62% for unprotected anal intercourse [25]. Therefore, promoting male homosexuals to detect HIV early and receive counseling before and after the examination together with taking PrEP to prevent HIV is important to decrease the spread of HIV among at-risk groups.

The main limitations of this study were that the HIV status of participants was not confirmed, an individual's intention to use PrEP may not reflect the actual behavior and the use of the snow ball sampling method. However, snowball sampling may be the most effective method due to the difficulty in approaching the target group. Moreover, using self-report of substance use, particularly regarding loss of control could be a limitation based on the subjective nature of reporting. The current study recommendations to increase daily PrEP uptake among YMSM and TGW include easy access to PrEP including an individual's ability to buy PrEP conveniently from the market and drug store, providing PrEP knowledge, provision of Voluntary Counseling and Testing (VCT) services and providing treatment for STIs. These are considered appropriate for YMSM and TGW to strengthen the effectiveness of HIV prevention and control.

Conclusion

The main findings of our study suggest that the history of taking an HIV test and perceived behavioral control were important predictors for the intention to take PrEP daily among YMSM and TGW in the Bangkok Metropolitan Area. Policymakers and health care professionals could use these findings to plan, implement and evaluate their health education programs and services. Inpractice, encouraging YMSM and TGW to obtain VCT, HIV testing, providing health education about PrEP and organizing PrEP promotional events to increase intention for daily PrEP intake are needed. Future rigorous mixed-method research should focus on how the history of HIV testing and perceived behavioral control and adherence may influence YMSM and TGW. Qualitative in-depth study of these factors for program implementation would be beneficial in order to develop a policy-driven intervention.

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