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RESEARCH ARTICLE

Factors Associated with Having Multiple Sexual Partners among Men Who Have Sex with Men University Students in Northern Thailand

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Abstract:

Background:

Men who have sex with men (MSM) university students were more likely to be infected with HIV than the general population due to various reasons, including having multiple sexual partners, having anal sex without a condom, and using alcohol and drugs. The objective of this study was to investigate the factors associated with multiple sexual partners among MSM university students in northern Thailand.

Methods:

The participants of this study were 139 MSM university students. The number of sexual partners in the last 12 months was used as the main outcome variable. Information was collected using an online self-administered questionnaire. The number of sexual partners for categories of participants was described as median and interquartile range. Factors that were independently associated with multiple sexual partners were identified using binary logistic regression analysis.

Results:

Findings showed that seeking sexual partners online (AOR = 1.72; 95% CI 3.10 - 44.29), drinking alcohol within the last 12 months (AOR=9.73; 95% CI 1.38 - 68.47), and having a self-perception of HIV risk (AOR=3.63; 95% CI 1.15 - 11.50) were independently associated with having multiple sexual partners.

Conclusion:

Health agencies and universities should develop strategies to promote life skills related to sexual responsibility, appropriate use of online media, and reduction of alcohol consumption among MSM university students.

Keywords: Multiple sexual partners, HIV, Men who have sex with men, University students, Northern Thailand, Adolescent.

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1. INTRODUCTION

Men who have sex with men (MSM) were more likely to be infected with HIV than other populations [1]. From 2017 to 2020, it was estimated that the number of MSM infected with HIV would increase by 57% in Western countries and North America, 41% in Latin America and the Caribbean, and 20% in Eastern Europe [2]. It was estimated recently that about 4.3%

of MSM in Southeast Asian countries were infected with HIV [3]. In 2018, the estimated number of MSM in Thailand was 527,900 of which 11.9% were infected with HIV [4]. This was higher than the proportion of HIV infections in other populations [1, 2, 5, 6].

Adolescent and young adult MSM aged between 18 to 25 had a higher risk of HIV infection compared to adult MSM [7]. In the United States in 2011, it was found that 92.8% of HIV-infected adolescent males aged 13 to 19 had sex with men [7]. Between 2006 and 2012, up to 3.0-6.4% of adolescent MSM in China were infected with HIV [8]. In Thailand, a study from 2006 to 2014 found increasing infection among adolescent

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MSM with an HIV incidence of 7.4 per 100 person-years [9].

MSM tended to have a higher number of sexual partners than heterosexual men and women [4, 10, 11]. In Thailand, young MSM who attended a gay sauna reported 2 different sexual partners for the last 1 month on average [12]. MSM who had multiple sexual partners were 2 times more likely to get infected from HIV, as reported by a Chinese study [13]. Research conducted in the U.S. among MSM with recent HIV infection also found that 56% of their sexual partners had multiple sexual partners [14]. These highlighted the important role multiple sexual partners might play in sustaining the MSM HIV epidemic.

Having multiple sexual partners, on its own, does not pose an increased risk of HIV and other sexually transmitted diseases (STIs) infection as long as condoms are used consistently. However, many studies found that having multiple sexual partners was associated with having unsafe sex among MSM [4, 15, 16]. A longitudinal study among university students in the US also found that participants who tended to have multiple sexual partners over time are at increased risk for having sex without protection [17]. The fact that some MSM did not disclose their HIV-positive status to their sexual partners increased the likelihood of transmission of HIV and other STIs. A study found that people who frequently changed sexual partners and had more than 2 sexual partners were more likely to acquire HIV or transmit HIV to others [18]. Therefore, having multiple sexual partners has been cited as an important risk factor of HIV infection among young MSM [15, 16]. The 2009 Centers for Disease Control and Prevention (CDC) Compendium of Evidence-Based HIV Prevention Interventions also considered the reduction of partner number as an important endpoint of HIV prevention programs [19].

Several factors have been associated with multiple sexual partners among MSM. Wang HY *et al.*, found that alcohol and drug use were associated with having multiple sexual partners and HIV infection among MSM in China [20]. A study from the United States also found that heavy drinking was associated with having more than 5 sexual partners among MSM [21]. Finding sexual partners online through social media, particularly through gay chat applications, was another important factor that was found to be related to having multiple sex partners [21, 27]. Studies showed that the use of social networking to find sexual partners increased the likelihood of having more sexual partners [28 - 30]. Other factors associated with having multiple sexual partners were forced sex, having a night out at pubs or bars, selling or buying sex [22], having group sex, and sexual initiation at a young age [23, 24]. Some psycho-social factors were identified as risk factors for multiple sexual partners in MSM. Intimate partner violence, childhood sexual abuse, alcohol use, drug use, and depression were found to associate with greater odds of being infected with HIV [25].

MSM university students are a large and unique population that is transitioning from late adolescence to early adulthood and who have high sexual drive. For many, this is the first time that they experience the freedom of living on their own in unfamiliar surroundings, while still lacking experience and maturity. These circumstances put them at risk for HIV infection. Information on the number of MSM university

students living with HIV and their sexual risk behaviors is limited.

The objective of this study was to investigate the prevalence of having multiple sexual partners and the factors associated with having multiple sexual partners among MSM university students in northern Thailand. The results of the study will be useful to guide the development of appropriate activities to reduce risky sexual behaviors by reducing the number of sexual partners and promoting consistent condom use behavior among this population.

2. MATERIALS AND METHODS

2.1. Study Design and Study Settings

This was a cross-sectional study. Data was collected from May to August 2018. The study sites were 2 public universities located in the same province in upper-northern Thailand. The first site was a small university offered bachelor's degrees in science and applied science, arts, and education and focused on local development. The second university offered programs in science and applied science, and arts. Most students from both universities came from rural areas with moderate economic backgrounds. Of the total number of 3,712 male students (as of October 31, 2017), the investigators estimated that 297 (8%) students would be MSM [26].

2.2. Population and Sampling

There was no sampling strategy used in this study as the population was hard-to-reach and the true size of this population was unknown. The goal was to recruit as many study participants as possible. The subjects were recruited through a dedicated study website, advertisement boards throughout the universities, and the 12 peer MSM students project volunteers (6 from each university) who invited friends in their MSM networks to participate. The inclusion criteria were enrollment at one of the two specified universities, identifying as MSM or bisexual, and literate in Thai. The exclusion criteria were being a transgender woman, given the difference in gender identity and behaviors of transgender women from MSM. It was estimated that there were 297 MSM students at the 2 study universities at the onset of this study. The minimum number of subjects required for the study was 135 considering 80% of subjects had multiple sexual partners [27], at a 95% confidence interval (CI), and 5% precision [28].

2.3. Data Collection

Each potential participant was given a unique password to access the survey by the peer volunteers. This was to prevent people not associated with the study from accessing the system and to keep sensitive personal information confidential. Once the password was entered, the system would link the participants to the study information sheet, which explained the background and significance of the study, benefits and possible risks of participating in the study, and how long it would take to complete the questionnaire. Once the participants provided consent, the program automatically links them to the self-administered online study questionnaire. The questionnaire was completed either through a mobile phone or a personal computer at the participant's convenience. The questionnaire took approximately 30 minutes to complete.

2.4. Measurements

2.4.1. The Questionnaire Consisted of 3 Parts Part 1: Personal Information and Sexual Behaviors

which included age, religion, household status (living alone, with family members or relatives, with sexual partner, with friend), university (A, B), faculty and year of study, employment (yes, no), being a member of an MSM network (yes, no), sexual preference (insertive only, insertive and receptive, bisexual), disclosure of sexual orientation (yes, no), and a number of sexual partners in the last 12 months. "Having multiple sexual partners" is considered as a primary outcome variable of the study and was defined as having more than one sexual partners in the last 12 months.

2.4.2. Part 2: HIV and Sexual risk Factors

which included drinking alcohol in the last 12 months (yes, no), using drugs or chem sex in the last 12 months (yes, no), seeking sexual partners online (ever, never), ever had a night out looking for a sexual partner (yes, never), ever sell sex (yes, never), ever buy sex (yes, never), ever been raped or sexually abused (yes, never). The questionnaires was adapted from the tool of Bureau of Epidemiology [29].

2.4.3. Part 3: Protective factors

which included self-esteem (low, medium, high), social support (low, medium, high), HIV knowledge (low, medium, high), and perceived risk of HIV infection (yes, no). In the original questionnaire, "perceived risk of HIV infection" was asked using a five-level Likert item. For the final variable, "no risk at all" was defined as "no" and the other responses were grouped as "yes". The self-esteem measurement was adapted from Coleman TA, (2014) [30]. The social support questionnaire was modified from the Health and Health Services study questionnaire from the Exploring Health Care Access for Gay, Bisexual, and Other Men Who Have Sex with Men Living In Middlesex County, Ontario [30]. There were 18 items in the *HIV knowledge test battery*, which were adapted from Carey and Schroder (2002) [31] and Bureau of Epidemiology (2012) [29]. The measurement scales were reviewed by content experts and were tested for reliability. The

Cronbach's alphas were 0.71 for the self-esteem measurements, 0.852 for the social support measurement, and 0.758 for the HIV knowledge measurements.

2.5. Statistical Analysis

Data were analyzed using SPSS for Windows 22. Basic characteristics and health-related information were stratified and described using numbers and percentages. The median number of sexual partners in the last 12 months and its interquartile range for each category of all characteristics were shown and compared. A bivariate analysis to find factors associated with multiple sexual partners was conducted. Significant variables from the bivariate analysis were then included in a multivariate logistic regression analysis to identify factors that were independently associated with multiple sexual partners.

3. RESULTS

A total of 139 MSM university students participated in this study. Most were over 18 years (88%) and Buddhist (97%). Thirty-seven percent lived with friends and 36% lived alone. Approximately 3 out of 4 were enrolled at university A and studying in the Faculty of Arts and Education. The number of participants was equally distributed by academic year. Only 13% worked while studying while 12% were members of MSM networks. Sixty-three percent of the participants identified as insertive gay, 18% as bisexual, and 17% as both insertive and receptive. Most participants (87%) had disclosed their sexual orientation to others. When considering the median number of partners in the past 12 months as stratified by different subgroups, it was found that the median number of partners was higher among participants under 18 than among participants over 18 (4 versus 3) and the median number of partners among Christians was higher than among Buddhists (7 versus 3). It is important to note that there were only 4 Christian participants. The median number of partners was higher among participants who lived with others than among those who lived alone (3 versus 2) and the median number of partners was higher among students from university B university than among students from university A (Table 1).

Table 1. Basic characteristics and median number of sexual partners in the last 12 months among MSM university students.

Characteristics (N=139)	n (%)	Median Number of Sexual Partners in the Last 12 Months (Q1,Q3)
Age (years), mean = 20.64, SD = 2.03		
18	17 (12.2)	4 (2,5)
>18	122 (87.8)	3 (2,4)
Religion		
Buddhism	135 (97.1)	3 (2,4)
Christianity	4 (2.9)	7 (2.5,9.5)
Household status		
Live alone	50(36.0)	2 (2,3)
Live with family members or relatives	16(11.5)	3 (2,4)
Live with sexual partner	22(15.8)	3 (2,4)
Live with friend	51(36.7)	3 (2,5)
University		
A	101(72.7)	2 (2-4)
B	38 (27.3)	3 (2-5)

(Table 1) *contd....*

Characteristics (N=139)	n (%)	Median Number of Sexual Partners in the Last 12 Months (Q1,Q3)
Faculty		
Sciences and applied sciences	39 (28.1)	3 (2-6)
Arts and education	100 (71.9)	2.5 (2-3.7)
Year of matriculation		
1	39 (28.1)	2 (1-4)
2	39 (28.1)	3 (2-5)
3	32 (23.0)	3 (2-3)
4	29 (20.9)	3 (2-5.5)
Currently employed		
Yes	18 (12.9)	3 (2-5)
No	121(87.1)	3 (2-4)
Member of gay social group		
Yes	17 (12.2)	3 (2-4.5)
No	122(87.8)	3 (2,4)
Sexual preference		
Insertive only	88(63.3)	3 (2,4)
Insertive and receptive	25(18.0)	2 (2-3.5)
Bisexual	26 (18.7)	3 (1.7-5)
Disclosure of sexual orientation		
Yes	120(86.3)	3 (2-4)
No	19(13.7)	3 (1-5)
Sexual preference		

In the past 12 months, most participants drank alcohol (93%), spent a night out looking for sexual partners (76%), and sought sexual partners online (64%). Only a small proportion sold sex (15%), bought sex (5%), or were raped (10%). All participants had moderate levels of self-esteem, while 91% and 75% had moderate levels of social support and HIV knowledge, respectively. As for HIV risk perception, it was

found that 55% of the students perceived themselves to be at risk of HIV infection. The median number of partners during the last 12 months was higher among participants who: drank alcohol (3 versus 1.5), searched for sexual partners online (3 versus 2), had a night out looking for sexual partners (3 versus 2), sold sex (4 versus 2), bought sex (4 versus 3), and perceived themselves to be at risk of HIV infection (3 versus 2) (Table 2).

Table 2. Health risk behaviors, psycho-social, HIV related characteristics and median number of sexual partners in the last 12 months among MSM university students.

Characteristics (N=139)	n (%)	Median Number of Sexual Partners in the Last 12 Months (Q1,Q3)
Drunk alcohol in the last 12 months		
Yes	129(92.8)	3 (2-4)
No	10 (7.2)	1.5 (1-4)
Used drugs or chem sex in the last 12 months		
Yes	10 (7.2)	3 (2-5)
No	129(92.8)	3 (2-4)
Sought sexual partners online		
Yes	84 (60.4)	3 (2-5)
Never	55 (39.6)	2 (1-3)
Night out seeking sexual partners		
Yes	105(75.5)	3 (2-5)
Never	34(24.5)	2 (1-3)
Sold sex		
Yes	21 (15.1)	4 (3-10)
Never	118(84.9)	2 (2-4)
Bought sex		
Yes	7 (5.0)	4(2-5)

(Table 2) contd....

Characteristics (N=139)	n (%)	Median Number of Sexual Partners in the Last 12 Months (Q1,Q3)
Never	132 (95.0)	3 (2-4)
Been Raped or sexually abused		
Yes	14 (10.1)	2.5 (2-6.5)
Never	125(89.9)	3 (2-4)
Self-esteem		
Low	0 (0.00)	0
Medium	126 (90.6)	3 (2-4)
High	13 (9.4)	3 (2-4)
Social support		
Low	13 (9.4)	3 (2-6.5)
Medium	104(74.8)	3 (2-4)
High	22(15.8)	2.5 (1.7-5)
HIV knowledge		
Low	43 (30.9)	3 (2-4)
Medium	67 (48.2)	3 (2-4)
High	29 (20.9)	3 (1.5-5)
Perceived risk of HIV infection		
Yes	76 (54.7)	3 (2-5)
No	63 (45.3)	2 (1-3)

3.1. Factors Associated with Multiple Sexual Partners

After adjusting for the variables that were statistically significant in the bivariate analysis, the multivariate logistic regression model showed that seeking sexual partners online

(AOR=11.72; 95% CI 3.10 – 44.29), drinking alcohol before having sex (AOR=9.73; 95% CI 1.38 - 68.47) and perceived risk of HIV infection (AOR=3.63; 95% CI 1.15 – 11.50) were independently associated with having multiple sexual partners (Table 3).

Table 3. Proportion and factors associated with having multiple sexual partners among MSM university students.

Characteristics (N=139)	n/N (%)	OR (95%CI)	AOR (95%CI)
Age (years), mean±SD 20.64 (2.03)			
18	14/17 (82.4)	Reference	-
>18	102/122 (83.6)	1.09 (0.29-4.16)	-
Religion			
Buddhism	114/135 (83.47)	Reference	-
Christianity	3/4 (75.0)	1.71 (0.17-17.2)	-
Household situation			
Live alone	39/50 (78.0)	Reference	-
Live with family members or relatives	14/16 (87.35)	0.41 (0.30-1.97)	-
Live with sexual partner	20/22 (90.9)	0.20 (0.60-2.872)	-
Live with friend	45/51 (88.2)	0.42 (0.72- 1.52)	-
University			
A	82/101 (81.2)	Reference	-
B	34/38 (89.5)	1.90 (0.62-6.22)	-
Faculty			
Sciences and applied sciences	79/100 (79.0)	Reference	Reference
Arts and education	37/39 (94.9)	4.92 (1.10-22.09)*	7.00 (0.97 – 50.66)
Year of matriculation			
1	32/39 (82.1)	Reference	-
2	34/39 (87.2)	2.35 (0.72-7.65)	-
3	28/32 (87.5)	2.41 (0.68-8.60)	-
4	25/29 (86.2)	2.16 (0.60-7.73)	-
Currently employed			
Yes	15/18 (83.3)	Reference	-
No	101/121 (83.5)	1.01 (0.27-3.82)	-

(Table 3) *contd....*

Characteristics (N=139)	n/N (%)	OR (95%CI)	AOR (95%CI)
Member of gay social group			
Yes	14/17 (82.4)	Reference	-
No	102/122(83.6)	1.09 (0.29- 4.16)	-
Sexual orientation			
Insertive and receptive	22/25 (88.0)	Reference	-
Insertive only	74/88 (84.1)	0.72 (0.19- 2.74)	-
Bisexual	20/26 (76.69)	0.46 (0.10- 2.06)	-
Disclosure of sexual orientation			
Yes	103/120 (85.5)	2.80 (0.94 - 8.36)	-
No	13/19 (68.4)	Reference	-
Drunk alcohol in the last 12 months			
Yes	111/129 (86.0)	6.17 (1.62 - 23.45)*	9.73 (1.38 - 68.47)*
No	5/10 (50.0)	Reference	Reference
Used drugs or chem sex during the last 12 months			
Yes	9/10 (90.0)	1.85 (0.22- 15.36)	-
No	107/129 (82.9)	Reference	-
Sought sexual partners online			
Yes	81/84 (96.4)	15.43 (4.30 – 55.30)*	11.72 (3.10 – 44.29)*
Never	35/55 (63.6)	Reference	Reference
Night out seeking sexual partners			
Yes	91/105 (86.7)	2.34 (0.91-6.33)	-
Never	25/34 (73.5)	Reference	-
Sold sex			
Yes	20/21 (95.2)	4.58 (0.58 -36.00)	-
Never	96/118 (81.4)	Reference	-
Bought sex			
Yes	6/7 (85.7)	1.20 (0.14-10.47)	-
Never	110/132 (83.3)	Reference	-
Been raped or sexually abused			
Yes	13/14 (92.9)	2.78 (0.35 - 22.35)	-
Never	103/125 (82.4)	Reference	-
Self-esteem			
Low	0 (0.00)	-	-
Medium	104/126 (82.5)	0.39 (0.05-3.19)	-
High	12/13 (92.3)	Reference	-
Social support			
Low	11/13 (84.6)	1.62 (0.27-9.85)	-
Medium	88/104 (84.6)	1.62 (0.52-5.01)	-
High	17/22 (77.3)	Reference	-
HIV knowledge			
Low	38/43 (84.4)	2.42 (0.69 - 8.54)	-
Medium	56/67 (83.6)	1.62 (0.56 - 4.71)	-
High	22/29 (75.9)	Reference	-
Perceived at risk of HIV infection			
Yes	70/76 (92.1)	4.31 (1.58-11.75)*	3.63 (1.15 – 11.50)*
No	46/63 (73.0)	Reference	Reference

*statistically significance.

4. DISCUSSION

This is the first study to examine factors associated with having multiple sexual partners among MSM university students in Thailand. Having multiple sexual partners among young MSM is a significant public health issue as it has been associated with unprotected sex and is the driver of increased

risk of HIV infection and other STIs [17, 22 - 24, 29, 32]. The results showed that the study participants had an average of 3 sexual partners in the past 12 months. This was consistent with several studies which found that most young MSM had more than 2 sexual partners [6, 11, 17, 33 - 36].

Our study found that seeking sexual partners online was

the strongest predictor of having multiple sex partners among MSM university students (AOR = 13.2). This is in line with a study conducted in Vietnam which found that MSM university students who used the Internet to find sexual partners were 2.5 times more likely to have multiple sexual partners than those who did not use the Internet. A review of 11 studies in China also found that 53.5% of MSM used the Internet to find sexual partners, and that this behavior was more common in larger than smaller cities [37 - 39]. A recent study among young MSM in China categorized 4 types of online sexual partners with different levels of HIV risk [40]. To alleviate the consequences of seeking partner online behavior, an article suggested online behavioral interventions that address unprotected anal intercourse and promote frequent HIV testing [41].

Drinking alcohol was another factor associated with having multiple sexual partners among this group. Alcohol has been found to reduce shyness, nervousness, and reasoned thinking while increasing self-confidence. This can allow MSM the courage to interact with people they have just met, potentially leading to sexual intercourse and lack of proper protection [42, 43]. The results of this study were consistent with the results of other studies showing that alcohol use among MSM was associated with an increase in the number of sexual partners, an increase in sexual intercourse with both regular and casual sex partners, and a decrease in condom use [11, 23, 34, 43]. A 2014 study by Mutinta in South Africa indicated that male university students who drank alcohol were often influenced by friends and had three times the number of sexual partners compared to those who did not drink [34]. This was also consistent with a 2014 study in China which found that MSM who drank alcohol more than once a week were more likely to use drugs, have unprotected anal sex, or have more than 10 male partners [44]. To date, there has been no proved intervention to reduce alcohol use disorders among MSM. Motivational interviewing and cognitive behavioral therapy were found to have some effects according to a systematic review [45].

MSM university students who perceived themselves at risk of HIV infection had a higher probability of having multiple sexual partners than those who perceived themselves as having no risk of HIV infection. This finding was understandable and self-explanatory. Participants who had multiple sexual partners oftentimes did not know their partners' HIV status increasing their perception of HIV risk. It is interesting to consider whether an awareness of HIV risk reduces engagement in risky behaviors. A study by Garcia, *et al.* found that MSM in Vietnam tended to have more sexual partners even though they already perceived HIV risk [11]. However, a study among young MSM in the US found that those who perceived themselves to be infected with HIV were less likely to have multiple sexual partners [46].

Universities and public health departments should develop a standardized service to prevent HIV and other STIs among MSM university students. The service should be designed in accordance with the Sex-positive framework [47] and Declaration of Sexual Rights [9, 48]. Under these principles, youths' sexual activities are not viewed as bad things or things

that youth need to be abstained from. The initiative should focus on promoting safe sex, sexual well-being and sexual self-efficacy instead of trying to reduce the number of sexual partners. A meta-analysis did not find a positive impact of risk reduction interventions on a number of sexual partners [49]. MSM Students who used alcohol and online dating apps should have access to necessary information and resources. This includes Pre-exposure prophylaxis for HIV (PrEP), Post-exposure prophylaxis for HIV (PEP), HIV testing, distribution of condoms and lubricants, and counseling to reduce risky sexual behaviors. Organizations should also find ways to provide knowledge and understanding about alcohol use and foster skills on the proper use of information technology. Special consideration should be given to the constructive use of existing online dating apps as a platform to educate and counsel MSM university students about sexual health and promote timely access to sexual health services. Among the top priorities is to navigate students who perceive themselves as having risk of HIV infection into HIV counselling and testing service as quickly as possible. These services could be delivered through various channels such as student clubs and existing networks.

The current study had some limitations. The sample size was small, and participants were not randomly selected due to the hard-to-reach nature of the population. There are chances of false negative results (Beta error) due to small sample size. It is also possible that students who were eligible did not participate in the study. Therefore, the study results may not represent the entire target population. While the questionnaire was self-administered through an online system, it is possible that participants were not entirely truthful when answering the questions. The use of single question to assess alcohol drinking and having multiple partners also prevented us from fully understanding the nature of alcohol use and multiple sex partners. Future studies should include qualitative research on the thoughts, beliefs and attitudes related to having multiple partners, with a particular focus on factors associated with using the Internet to seek sexual partners and drinking alcohol before sex.

CONCLUSION

Seeking sexual partners online, drinking alcohol within the last 12 months, and having a self-perception of HIV risk were independently associated with having multiple sexual partners among MSM university students in northern Thailand. Health agencies and universities should develop strategies to promote appropriate use of online media, and reduction of alcohol consumption among this population. In addition, knowledge about HIV and STIs should be provided to raise awareness about negative aspects of sexual risk behaviors.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

This study was approved by the Research Ethics Committee, Faculty of Medicine, Chiang Mai University (Certificate No. 228/2560). The passwords to enter the project's website were distributed to potential MSM student participants through trained MSM peers. Once logged in, the respondents were screened for eligibility. Those who qualified

were referred to the information sheet. Participation was voluntary, and all participants had to provide informed consent through the system. All participant information was confidential as no identifiable personal information was collected, and data was only be accessed by the researchers.

HUMAN AND ANIMAL RIGHTS

No animals were used in this study. All human research procedures were followed in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national), and with the Declaration of Helsinki.

CONSENT FOR PUBLICATION

The authors affirm that human research participants provided informed consent for publication.

AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of the article is available in ‘figshare’ at https://figshare.com/articles/dataset/Data_Thesis_MSM-Access_and_Barriers_2020-04-7_sav/14811372, reference number doi:10.6084/m9.figshare.14811372.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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