

Factors associated with concurrent sexual partnerships among men who have sex with men in Yangon, Myanmar

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ABSTRACT

Men who have sex with men (MSM) are considered to be one of the groups most at risk of contracting HIV. However, to date, information regarding MSM's sexual behaviors and the risk factors for their concurrent sexual partnerships (CSP) have not been known in Myanmar. This study aimed to identify factors associated with CSP among MSM. A cross-sectional study was conducted from September to October 2011 in Yangon, Myanmar. In total, 353 males who had self-reported sex with men were recruited using respondent-driven sampling method. Descriptive statistics and multivariate logistic regression analysis were performed. In total, 61.0% of the MSM reported having CSP. MSM who practiced sex trading in the past six months (adjusted odds ratio 8.32; 95% confidence interval [CI]: 2.30–30.10), MSM who had diagnosed with STIs/HIV (AOR 6.71; 95% CI: 4.78–9.28), and MSM who engaged in unprotected insertive anal sex (AOR 1.27; 95% CI: 1.02–1.45) were more likely to have CSP. In contrast, MSM who used condoms consistently during the past six months (AOR = 0.27; 95% CI: 0.08–0.94), MSM who had a regular job (AOR = 0.21; 95% CI: 0.06–0.74), and MSM who initiated sexual activities later in their lives (AOR = 0.08; 95% CI: 0.03–0.25) were less likely to have CSP. Concurrent sexual partnerships are common among MSM in Myanmar. Findings suggest that interventions should focus on MSM who diagnosed with STIs/HIV, do not have regular jobs, and initiated their sexual activities at an early age.

Keywords: concurrency, MSM, sexual behavior, HIV, Myanmar

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INTRODUCTION

Men who have sex with men (MSM) have been disproportionately affected by the human immunodeficiency virus (HIV) throughout the world.¹⁾ Sexual contact between men remains one of major drivers of the HIV/AIDS epidemic and sexually transmitted infections (STIs) in Asia, and elsewhere. Recent data also indicate an emerging HIV epidemic among MSM in Myanmar.²⁻³⁾ In 2008, it was estimated that 69,120 MSM were living with HIV/AIDS, accounting for 28.8% of the total number of estimated HIV cases in Myanmar, which was 47 times higher than that of the general population (0.61%).²⁾ In this country, 11.8% of MSM had STI symptoms in the past three months, and only 26.2% of them had ever been diagnosed with STIs.³⁾

Sociodemographic, behavioral, and psychosocial risk factors⁴⁻⁷⁾ for HIV infection and other STIs are well known, but it remains unclear as to how patterns of sexual relationships influence the spread of HIV among MSM. Of the different partnership patterns, “concurrent partnerships” might be the riskiest in terms of contracting STIs. Sexual concurrency is defined as overlapping sexual partnerships, in which sexual relationships with one partner occur between acts of intercourse with another partner. Such partnerships are a significant factor in the spread of HIV amongst MSM.⁸⁾ Concurrent sexual partnerships are associated with an elevated risk of contracting HIV and other STIs among the general population, as well as in MSM.⁹⁻¹¹⁾

However, few studies have assessed the link between concurrent relationships and associated risk factors among MSM. Most of these studies were conducted in developed countries and mainly focused on mathematical models.¹²⁻¹⁵⁾ Within the region of South East Asia, little research been conducted, and most of the studies have mainly focused on the prevalence and impacts of STIs and HIV infections among MSM.¹⁶⁻¹⁷⁾ Disaggregated data are lacking regarding the number, frequency, and gender of the sexual partners of MSM. In Myanmar, most of the interventions targeting MSM focus on promoting condom use in extramarital sex. Interventions often neglect other types of sexual behaviors that carry an elevated risk of contracting HIV. The study of concurrent sexual partnerships is new in Myanmar, and it is a worthwhile topic. In this study, we identified the factors associated with concurrent sexual partnerships among MSM by examining one study area, Yangon, Myanmar, where HIV prevalence among MSM is extremely high compared with to other cities.

MATERIALS AND METHODS

Study settings and participants

We conducted this cross-sectional study in Yangon, located in lower Myanmar at the convergence of the Yangon and Bago Rivers. Yangon is the former capital city of Myanmar, and continues to be the country’s largest city and the most important commercial center. It is divided into four districts, which include a total of 45 townships (a township is usually composed of towns in urban areas and village tracts in rural areas in Myanmar). The total population was approximately 5.56 million in 2010.²⁾ HIV prevalence among MSM is 23.5% in Yangon.^{2,18)} We carried out this study during between September and October 2011. We collected the data from 353 MSM who had lived in Yangon for at least three months prior to the interview date. To be eligible, participants had to fulfill the following criteria: be of the male gender, be at least 18 years of age, and self-report having sex with men. After a participant provided informed consent for participation in the study, we interviewed them for 30 to 45 minutes using a pre-tested questionnaire. The questionnaire was translated from English to Myanmar language and pre-tested among MSM population outside the study sites in September 2011 by researchers.

Back translation of the instrument from the Myanmar language to English was done before and after the pretest to ensure semantic equivalence. Also, the questionnaire was modified based on the results of the pre-test to make it more understandable and easier to answer for participants. Also, a diagram to explain about concurrent sexual partnership was developed after the pre-test to help MSM understand the concept better. The questionnaire consisted of four sections: i) sociodemographic characteristics, ii) sexual behaviors, iii) knowledge of STIs and HIV/AIDS, and iv) STI and HIV testing and health-seeking behavior.

Data collection procedure

We selected the participants by respondent-driven sampling (RDS), which is used to recruit hard-to-reach and hidden populations.¹⁹⁾ First, we selected seven locations (one or two in each of the four districts in Yangon) where MSM networks exist. Second, we recruited a “leader” MSM in each location as the main seeds (the first study participants recruited) for the RDS. Third, the main seeds were interviewed and then asked to recruit three MSM friends to take part in this study, according to the RDS recruitment procedure. Likewise, those MSM who were recruited by the main seeds each recruited three MSM friends after completing their interviews. All participants received remuneration (\$2.30 USD) for their time, and transportation directly following their interviews. Each participant was eligible to receive a secondary incentive (three packs of condoms and one lubricant) only after the MSM they recruited had participated in the study.

Before conducting each interview, we clearly explained to the participants the objective of this study and the pertinent study procedures. If participants fully understood and decided to participate in this study, they indicated their consent by signing an informed consent form. They were also informed that they could skip answering any question that they did not want to answer, and that they could withdraw from participation at any time during or after the interview without penalty. We translated the questionnaire from English to the Myanmar language. Subsequently, another researcher, fluent both in English and the Myanmar language, back translated the instrument before the pre-test to ensure semantic equivalence. We then conducted a pretest with 30 MSM, who were resident outside the study sites in September 2011. Based on the pretest results, we modified the questionnaire to make it more comprehensible and easier for the participants to answer. In the light of the pretest, we also developed a diagram to aid in explaining the concept of concurrent sexual partnerships.

We hired five supervisors (coupon managers) and nine MSM peer interviewers who were familiar with the target population. We gave one day of training to each, prior to the survey, on the study objectives and procedures, and on the importance of maintaining the confidentiality of the participants’ information. The training was carried out using a field manual, which we developed in the Myanmar language. We divided the research team into several groups. The groups visited nightclubs, bars, work places, and beauty salons at the study sites, and interviewed MSM participants. A field supervisor accompanied each group to the study sites, and supervised the fieldwork to assure interview quality.

We collected data using a standardized, pre-coded questionnaire based on the Behavioral Surveillance Survey questionnaire developed by the WHO/MOH, Myanmar.²⁰⁾ The reliability of the test, and the validity of the questionnaire have been previously established among MSM in Myanmar.²¹⁾ We assessed concurrent sexual partnerships based on the definition proposed by UNAIDS: “overlapping sexual partnerships where sexual intercourse with one partner occurs between two acts of intercourse with another partner”.²²⁾ In order to judge whether a participant had engaged in concurrent sexual partnerships, we asked a combination of questions addressing the number and timing of his sexual partners over the past six months. If the participant could

not easily understand the concept of concurrent sexual partnerships, we used a diagram to assist in his understanding.

We collected data on several sociodemographic variables: age, marital status, current living status, educational background, ethnic group, and occupation. We assessed substance use in terms of alcohol, injecting drugs, and non-injecting drugs. We also asked questions related to sexual behaviors in colloquial language, using explicit wording to describe sexual practices, including receptive and insertive anal sex. These questions included the age of sexual initiation, gender of first sexual partner, number of sexual partners, type of sexual partners, consistency of condom use, and types of sexual intercourse experienced during the past six months.

We assessed participants' knowledge on topics relating to STIs and HIV/AIDS, which included self-perception of HIV risk and knowledge of HIV/AIDS and other STIs. The total score for HIV knowledge ranged from 0 to 10, with one point awarded for each correct response. We created binary variables for each of these responses, coding "correct" and "incorrect" responses. The measurement of HIV knowledge had adequate internal consistency for this sample (Cronbach's $\alpha = 0.87$). We measured perceived risk of HIV infection using a single question asking participants about their perception of the possibility of acquiring HIV themselves. We measured condom use by asking participants about their condom use with each type of sexual partner during each sexual encounter over the last six months. We defined consistent condom use as "using condoms in every act of sexual intercourse in the past six months" and inconsistent condom use as "not using condoms for every act of sexual intercourse in the past six months".²³⁾ The STI and HIV section of the questionnaire included items about experience with common STI symptoms, HIV testing frequency, place of HIV testing, motivational factors for HIV testing, and knowledge of the HIV test result.

Statistical analysis

We used the Statistical Package of the Social Sciences (SPSS) 18.0 software (SPSS Inc., Chicago, Illinois, USA) for data entry and statistical analyses. We calculated descriptive statistics for sociodemographic, health and sexual behaviors, STI/HIV knowledge, and health-seeking behaviors. We performed comparisons between groups using chi-square tests. In all analyses, the level of significance was set at $p < 0.05$ (two-tailed). To determine which factors were most strongly associated with concurrent relationships among MSM, we tested a multivariate logistic regression model. We estimated odds ratios (ORs) to assess the strength of the associations, and used 95% confidence intervals (CIs) for significance testing. We entered all the covariates into the multiple regression models simultaneously. We fitted the logistic regression model by considering whether the MSM had concurrent sexual partners as a dependent variable, which was dichotomized by assigning "1" if the respondent had concurrent partners and "0" otherwise. We checked for multicollinearity, finding the variable "regular partners in the past six months" to be collinear with both the "number of partners in the past six months" and the "casual partners in the past six months." Therefore, we excluded the "regular partners in the past six months" variable from the multivariate analysis.

Ethical considerations

Before the interviews, we obtained written informed consent from the participants regarding their willingness to participate in the study. To assure confidentiality, we used RDS coupon numbers instead of personal identifying information, such as name, address, or national registration number. The Research Ethics Committee of the University of Tokyo, Tokyo, Japan approved the study protocol, and the Preventive and Social Medicine Society, Myanmar Medical Association, Myanmar, also assisted in protocol review.

RESULTS

Descriptive statistics

Out of 353 MSM, 61.0% (n = 215) had concurrent sexual partnerships, 51.0% (n = 180) were aged 27 years or below, and 76.8% (n = 271) were single/divorced or separated (Table 1). Among the entire participant group, 66.6% (n = 235) completed higher education and 79.6% (n = 281) belonged to the Bamar ethnicity. Regarding occupation, 73.9% of the total sample had

Table 1 Socio demographic characteristics of the study participants (N = 353)

Variable	Total N (%)	Had concurrent sexual partner		P-value
		Yes n (%)	No n (%)	
Age, years				
≤27	180 (51.0)	120 (55.8)	60 (43.5)	
>27	173 (49.0)	95 (44.2)	178 (56.5)	0.002
Marital status				
Single/divorce/separated	271 (76.8)	168 (78.1)	103 (74.5)	
Married	82 (23.2)	47 (21.9)	35 (25.5)	0.447
Currently living with				
Alone/friends	100 (28.3)	71 (33.0)	29 (21.0)	
Wife/sexual partner/husband	60 (17.0)	35 (16.3)	25 (18.1)	
Parents/relative	193 (54.7)	109 (50.7)	84 (60.9)	0.049
Education				
Never/primary/secondary	118 (33.4)	76 (35.3)	42 (30.4)	
High school and above	235 (66.6)	139 (64.7)	96 (69.6)	0.340
Ethnicity				
Bamar	281 (79.6)	165 (76.7)	116 (84.1)	
Other	72 (20.4)	50 (23.3)	22 (15.9)	0.096
Employment status				
Non-regular job	92 (26.1)	72 (33.5)	20 (14.5)	
Regular job	261 (73.9)	143 (66.5)	118 (85.5)	<0.001
STIs knowledge				
No	43 (12.2)	25 (11.6)	23 (16.7)	
Yes	310 (87.8)	190 (88.4)	115 (83.3)	0.178
HIV knowledge scores				
≤7	178 (50.4)	108 (50.2)	70 (50.7)	
>7	175 (49.6)	107 (49.8)	68 (49.3)	0.928
Perceived HIV risk				
No risk	94 (26.6)	61 (28.4)	33 (23.9)	
Having risk	259 (73.4)	154 (71.6)	105 (76.1)	0.355
Ever had HIV test				
No	47 (13.3)	27 (12.6)	25 (18.1)	
Yes	306 (86.7)	188 (87.4)	113 (81.9)	0.151
Diagnosed with an STI/HIV in the past six months				
No	135 (38.2)	50 (23.3)	85 (61.6)	
Yes	218 (61.8)	165 (76.7)	53 (38.4)	<0.001
Total	353(100.0)	215 (100.0)	138 (100.0)	

regular jobs and 87.8% knew about STIs. Furthermore, a total of 306 MSM (86.7%) had tested for HIV and 218 MSM (61.8%) had diagnosed with STIs/HIV in the last six months (Table 1).

Among the participants, 65.2% (n = 230) used alcohol before sex, 48.2% (n = 170) used non-injecting drugs, and 8.8% (n = 31) used injecting drugs in the past six months (Table 2). A substantial portion of MSM had homosexual orientation (69.7%), 51.6% had more than five sexual partners in the past six months. Regarding specific types of sexual partners in the past six months, 60.6%, 63.2%, 25.5%, and 19.5% had regular, casual, received, and paid partners, respectively. In addition, 51.6% (n = 182) had unprotected receptive anal sex and 52.7% (n = 186) used condoms consistently in the previous six months, and 16.4% reported that they had an experience of forced sex in the past 12 months (Table 2).

The bivariate analyses revealed several significant differences in having concurrent partnerships across different groups (Table 1). Specifically, MSM who were less than 27 years old, living with parents/relatives, and single/divorced or separated were more likely to report having concurrent partnerships than their counterparts. Reports of having concurrent sexual partners were more frequent among MSM who had regular jobs and who had been diagnosed with STIs/HIV in the last six months (Table 1). MSM who used alcohol before sex were more likely to report having concurrent partnerships (Table 2). Among those, MSM who used non-injecting drugs (such as heroin, cocaine, and marijuana) in the past six months (48.2%) had concurrent partnerships.

The rate of concurrent partnerships was higher among homosexual MSM and MSM whose age at sexual initiation was 14 years or younger. In addition, MSM who had regular and casual partners in the past six months were more likely to report having concurrent sexual partners than their counterparts (Table 2). In addition, MSM who had received and paid for sex in the past six months were less likely to report having concurrent sexual partners. MSM who had unprotected insertive and receptive anal sex in the past six months were more likely to report having concurrent sexual partners. Reports of having concurrent partnerships were more frequent among those MSM whose sexual acts took place in a hotel/inn/guest house or in their own home. In addition, MSM who used condoms consistently were less likely to report having concurrent partners than those who did not (Table 2).

Multivariate analysis

Multivariate analysis revealed that MSM who had a regular job (adjusted OR [AOR] = 0.21; 95% CI: 0.06–0.73), initiated sexual activities after the age of 14 years (AOR = 0.08; 95% CI: 0.03–0.25), had sex in hotels or guest houses (AOR = 0.21; 95% CI: 0.08–0.57), and had an experience of forced sex (AOR = 0.27; 95% CI: 0.08–0.89) were less likely to have had concurrent sexual partnerships. In addition, MSM who used condoms consistently during the past six months were less likely to have had concurrent sexual partnerships.

MSM who had sex with more than five partners, with casual partners, with sex-trading partners (exchanged sex for money or drug),²⁴⁾ and with paid partners in the past six months were 6.56, 6.83, 8.32, and 6.41 times more likely, respectively, to have reported concurrent partnerships during the past six months. MSM who had engaged in unprotected insertive anal sex (AOR = 6.41; 95% CI: 1.65–24.92), had been diagnosed with HIV or any other STIs in the past six months (AOR = 6.71; 95% CI: 4.78–9.28), and had ever received an HIV test (AOR = 3.66; 95% CI: 1.57–5.81) were more likely to have had concurrent sexual partnerships. Furthermore, MSM who consumed alcohol before sex (AOR = 2.69; 95% CI: 1.67–8.67), injected drugs in the past six months (AOR = 1.48, 95% CI = 1.31–2.23), and used drugs by a non-injecting route in the past six months (AOR = 1.32, 95% CI = 1.06–1.78; Table 3) were more likely to have had concurrent sexual partnerships (Table 3).

Table 2 Health and sexual behaviors of the study participants (N = 353)

Variable	Total N (%)	Had concurrent sexual partners		P-value
		Yes n (%)	No n (%)	
Alcohol use before sex				
No	123 (34.8)	69 (29.3)	60 (43.5)	
Yes	230 (65.2)	152 (70.7)	78 (56.5)	0.006
Non-injecting drug use in the past six months				
No	183 (51.8)	69 (32.1)	114 (82.6)	
Yes	170 (48.2)	146 (67.9)	24 (17.4)	<0.001
Injecting drug use in the past six months				
No	322 (91.2)	119 (86.2)	203(94.4)	
Yes	31 (8.8)	19 (13.8)	12 (5.6)	0.008
Sexual orientation				
Homosexual	246 (69.7)	138 (64.2)	108 (78.3)	
Bisexual	107 (30.3)	77 (35.8)	30 (21.7)	0.005
Age of first sexual initiation, years				
≤14	169 (47.9)	134 (62.3)	35 (25.4)	
>14	184 (52.1)	81 (37.7)	103 (74.6)	<0.001
Number of partners in the past six months				
≤5	171 (48.4)	53 (24.7)	118 (85.5)	
>5	182 (51.6)	162 (75.3)	20 (14.5)	<0.001
Regular partner in the past six months				
No	139 (39.4)	86 (40.0)	53 (38.4)	
Yes	214 (60.6)	129 (66.0)	85 (61.6)	0.765
Casual partners in the past six months				
No	130 (36.8)	48 (22.3)	82 (50.7)	
Yes	223 (63.2)	167 (77.7)	56 (40.6)	<0.001
Sex-trading partners in the past six months				
No	263 (74.5)	135 (62.8)	128 (92.8)	
Yes	90 (25.5)	80 (37.2)	10 (7.2)	<0.001
Paid partners in the past six months				
No	284 (80.5)	156 (72.6)	128 (92.8)	
Yes	69 (19.5)	59 (27.4)	10 (7.2)	<0.001
Unprotected insertive anal sex in the past six months				
No	98 (27.8)	72 (33.5)	26 (18.8)	
Yes	255 (72.2)	143 (66.5)	112 (81.2)	0.003
Unprotected receptive anal sex in the past six months				
No	171 (48.4)	93 (43.3)	78 (56.5)	
Yes	182 (51.6)	122 (56.7)	60 (43.5)	0.015
Location of sexual act				
Public place/Outside	124 (35.1)	85 (39.5)	39 (28.3)	
Hotel/Inn/Guest house/House	229 (64.9)	130 (60.5)	99 (71.7)	0.030
Forced sex in the past 12 months				
No	295 (83.6)	117 (82.3)	113 (81.9)	
Yes	58 (16.4)	38 (17.7)	25 (18.1)	0.916
Consistent condom use in the past six months				
No	167 (47.3)	118 (54.9)	49 (35.5)	
Yes	186 (52.7)	97 (45.1)	89 (64.5)	<0.001
Total	353(100.0)	215 (100.0)	138 (100.0)	

Table 3 Multivariable analysis of factors associated with concurrent sexual partners (N = 353)

Variable	Having concurrent sexual partners		
	AOR	95% CI	P-value
Age (years)			
≤27	1	–	
>27	0.44	0.16–1.22	0.115
Marital status			
Single/divorce/separated	1	–	
Married	1.05	0.20–5.52	0.896
Currently living with			
Alone/friends	1	–	
Wife/sexual partner/husband	0.87	0.11–6.94	
Parents/relatives	0.71	0.23–2.20	0.987
Education			
Never/primary/secondary	1	–	
High school and above	1.53	0.58–4.00	0.392
Ethnicity			
Bamar	1	–	
Other	1.19	0.34–4.11	0.789
Employment status			
Non-regular job	1	–	
Regular job	0.21	0.06–0.73	0.014
Alcohol use before sex			
No	1	–	
Yes	2.69	1.67–8.67	0.035
Non-injecting drug use in the past six months			
No	1	–	
Yes	1.32	1.06–1.78	0.041
Injecting drug use in the past six months			
No	1	–	
Yes	1.48	1.31–2.23	<0.001
Sexual orientation			
Homosexual	1	–	
Bisexual	1.16	0.38–3.50	0.795
Age of sexual initiation (years)			
≤14	1	–	
>14	0.08	0.03–0.25	<0.001
Number of partners in the past six months			
≤5	1	–	
>5	6.56	5.20–12.71	<0.001
Casual partners in the past six months			
No	1	–	
Yes	6.83	2.56–18.22	<0.001
Sex-trading partners in the past six months			
No	1	–	
Yes	8.32	2.30–30.10	0.001
Paid partners in the past six months			
No	1	–	
Yes	6.41	1.65–24.92	0.007

Table 3 continues to next page

Table 3 Continued

Variable	Having concurrent sexual partners		
	AOR	95% CI	P-value
Unprotected insertive anal sex in the past six months			
No	1	–	
Yes	1.27	1.02–1.45	<0.001
Unprotected receptive anal sex in the past six months			
No	1	–	
Yes	0.50	0.15–1.69	0.263
Location of sexual act			
Public place/outside	1	–	
Hotel/inn/guest house/house	0.21	0.08–0.57	0.002
Forced sex in the past 12 months			
No	1	–	
Yes	0.27	0.08–0.89	0.031
Consistent condom use in the past six months			
No	1	–	
Yes	0.27	0.08–0.94	0.039
STIs knowledge			
No	1	–	
Yes	3.79	0.84–17.01	0.082
HIV knowledge			
No	1	–	
Yes	0.94	0.38–2.30	0.889
Perceived HIV risk			
No risk	1	–	
Having risk	0.11	0.03–0.45	0.002
Ever had HIV test			
≤ 7	1	–	
> 7	3.66	1.57–5.81	0.025
Diagnosed with an STI/HIV in the past six months			
No	1	–	
Ye	6.71	4.78–9.28	0.031

Note. AOR = adjusted odds ratio; CI = confidence interval

Adjusted for age, marital status, currently living with, education, ethnicity, employment status, alcohol use before sex, non-injecting drug use in the past six months, injecting drug use in the past six months, sexual orientation, age of sexual initiation, number of partners in the past six months, casual partners in the past six months, sex-trading partners in the past six months, paid partners in the past six months, unprotected insertive anal sex in the past six months, unprotected receptive anal sex in the past six months, location of sexual act, forced sex in the past 12 months, consistent condom use in the past six months, STI knowledge, HIV knowledge, Perceived HIV risk, Ever had HIV test, and diagnosed with an STI/HIV in the last six months.

DISCUSSION

In this study, out of 353 MSM, 61.0% reported that they had concurrent sexual partnerships during the past six months. This high rate of concurrent sexual partnerships is consistent with other studies carried out in developing countries, such as Africa²⁵⁾ and South East Asia.²⁶⁻²⁸⁾ In the present study, increased risks for concurrent sexual partnerships were having more than five partners in the past six months, early sexual initiation, inconsistent condom use, diagnosis of an STI in the past six months, ever having been tested for HIV, alcohol use before sex, having sex outside (e.g., public places, toilets, parks, and streets), and the location where sexual acts tended to take place. Protective factors against concurrent sexual partnerships were having a regular job, delaying sexual initiation, taking part in unprotected receptive anal sex, experiencing forced sex, and having relatively high perceived HIV risk.

In this study, 25.5% of the MSM practiced sex trading in the past six months. This percentage is much higher than that found by a prospective cohort study in Canada, which reported that 16.2% of gay and bisexual men engaged in sex trading.²⁹⁾ Sex trading is one of the behaviors that most increases HIV risk and which can lead to high HIV seroprevalence rates.³⁰⁻³¹⁾ MSM who practiced sex trading were more likely to have a large number of casual partners³²⁾ and to practice unsafe sex with non-trading sex partners,³³⁾ which resulted in an increased risk of STI infection among the respondents themselves, as well as in their sexual partners. In this sense, MSM who take part in concurrent partnerships, and who are practicing sex trading, may fuel the HIV epidemic among this group in Myanmar.

In this study, several additional increased risk factors were identified. The MSM who started their sexual activities before 14 years of age were more likely to have concurrent sexual partners. Early sexual initiation can result in larger numbers of sexual partners later in an individual's life,³⁴⁾ and can lead to intercourse outside of marriage,³⁵⁾ and consequently increases the vulnerability of such individuals to STI transmission. Our study also showed that participants who did not have a regular job were more likely to have had concurrent sexual partners.³⁶⁻³⁷⁾ Moreover, MSM who used alcohol before sex were more likely to have concurrent sexual partners. Other studies have also shown that alcohol consumption is associated with increases in risky sexual behaviors, such as having multiple concurrent sexual partners, being involved in unprotected paid sex,³⁸⁾ unprotected casual sex, group sex, and anal sex.³⁹⁾

MSM who used non-injecting drugs in the past six months were more likely to have partnership concurrency. Similarly, the use of drugs by the injection route was positively associated with partnership concurrency. These findings are consistent with prior studies.^{40,41)} We also found that participants who had casual, paid partners, and who had more than five partners in the past six months, were more likely to report partnership concurrency. This finding is consistent with a previous study based in Uganda.²⁵⁾

MSM who practiced unprotected insertive anal sex in the past six months were more likely to report partnership concurrency. This finding is consistent with studies based in the United States.⁴²⁻⁴³⁾ Practicing unprotected insertive anal intercourse is known to be directly associated with an increased risk of STIs, including HIV infection.⁴⁴⁻⁴⁵⁾ Consistent condom use is a critical tool for HIV prevention among MSM to limit the spread of STIs/HIV. The practice of consistent use of condoms by the study group is urgently needed.

MSM who were diagnosed with STIs/HIV during the past six months were 14 times more likely to have partnership concurrency. Having concurrent sexual partners is known to be associated with an increased risk of contracting STIs/HIV infection, as well as of transmitting the disease to other partners.⁴⁶⁻⁴⁷⁾ Our analysis also showed that MSM who used condoms consistently⁴⁸⁻⁴⁹⁾ and had ever been tested for HIV⁵⁰⁾ were less likely to have partnership concurrency.

In this study, MSM who chose hotels/inns/guest houses/houses for their sexual acts were negatively associated with having concurrent sexual partners. This may be because hotels/inns/guest houses are targeted for implementing HIV preventions in Myanmar. In such places, educational materials concerning HIV/AIDS, such as pamphlets, brochures, and free condom boxes, are available, and MSM may receive HIV-related information and free condoms through these programs. This may affect the attitudes of MSM, such that they limit their number of partners and restrict partnership concurrency. This information is particularly useful for designing intervention programs to reach those MSM who choose partnership concurrency.

This study has several limitations. First, as data were based on the participants' self-reports, there was a risk of under-reporting and social desirability bias during data collection.⁵¹⁾ However, to minimize this risk, peers of MSM were hired as interviewers to make participants feel more comfortable. In addition, confidentiality of the participants was carefully maintained throughout the study, with RDS identification codes used in place of participants' names. Second, recall bias might be unavoidable because the participants were asked to report their behaviors during the past six or more months. However, to minimize such bias, we inquired about the details of participants' sexual behaviors, and used validated and reliable instruments to collect data. Finally, this is a cross-sectional study, and does not allow us to prove causality. For instance, we cannot determine a causal relationship between concurrent sexual partnerships and having more than five sexual partners during the last six months. Despite such limitations, our findings have important implications as we have identified uniquely high-risk and protective behaviors of MSM by highlighting concurrent partnerships in Myanmar.

CONCLUSION

In conclusion, the majority of MSM in Myanmar engage in concurrent sexual partnerships and various risky sexual behaviors, such as having different types of sexual partners and engaging in inconsistent condom use with those partners. Behavioral interventions for MSM are urgently needed, especially for MSM who choose partnership concurrency. Our findings are useful for designing effective interventions. In particular, interventions should focus on MSM who use drugs and/or alcohol, do not have regular jobs, and initiated their sexual activities at an early age. Future longitudinal studies are needed to further investigate the long-term changes in partner types, substance use, risky sexual behaviors, and partnership concurrency among MSM in Myanmar.

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COMPETING INTERESTS

The authors declare that no competing interests exist.

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