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Drug Use and Sexual Behaviors Among MSM in China

Eric J. Nehl¹, Na He^{1,2}, Lavinia Lin¹, Tony Zheng³, Jessica A. Harnisch¹, Yingying Ding², Frank Y. Wong^{1,4}

¹Department of Behavioral Sciences & Health Education, Rollins School of Public Health, Emory University, Atlanta, Georgia, USA;

²Department of Epidemiology, School of Public Health, Fudan University, Shanghai, China;

³Shanghai Piaoxue, Shanghai, China;

⁴Hubert Department of Global Health, Rollins School of Public Health, Emory University, Atlanta, Georgia, USA

Abstract

Background: This study explores patterns of drug use and related correlates among a sample of men who have sex with men (MSM) and men who sell sex to other men (aka “money boys”) in China.

Objectives: Data were collected from MSM and money boys (MBs) in Shanghai, China using a Community Popular Opinion Leader (CPOL) research design with a self-administered cross-sectional survey to: (1) describe drug use and drug use correlates and (2) examine relationships between drug use and sexual behaviors in general MSM and MBs.

Methods: The sample consisted of 402 MSM (203 MBs) who live in Shanghai, China. Descriptive statistics and regression analyses were used to explore associations between drug use and sexual behaviors and make comparisons between MBs and general MSM.

Results: MBs reported using more drugs in the last week, 3 months and ever; sex after using drugs, and unprotected sex after using drugs more frequently than general MSM. Additionally, many MBs reported receiving free drugs from their clients and those who did receive free drugs were very likely to report having unprotected sex.

Conclusions: It is crucial to increase research and include Chinese MSM and their drug use in the Chinese policy conversation. These data suggest that drug use and sexual behaviors after drug use among Chinese MSM differ widely based upon selling sex and separate intervention strategies may be appropriate.

Keywords

Drug use; money boys; MSM; unprotected sex; sexual behaviors; psychosocial variables; CPOL recruitment; China

Address correspondence to Dr. Eric J. Nehl, Assistant Research Professor, Rollins School of Public Health; enehl@emory.edu.

Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

INTRODUCTION

Recent work in this journal correctly pointed out the Chinese governmental response to HIV/AIDS and drugs in China (Zhao & Ling, 2012b). Zhao & Ling illustrated the interaction of multiple systems of prevention, care, and treatment need to be coordinated to halt the spread of HIV/AIDS and drug use in this the world's most populous country. However, the struggle to control the HIV/AIDS epidemic and growing drug problem in China is further compounded by the stigma that surrounds same-sex sexual behaviors and the difficulty in comprehensive programming. China has made great strides in their responses to the HIV/AIDS epidemic (Lau, Lin, Hao, Wu, & Gu, 2011; Wu, Sullivan, Wang, Rotheram-Borus, & Detels, 2007) and has taken steps to modernize its approach to drug use and HIV/AIDS (Li, Ha, Zhang, & Liu, 2010), but the strong connection between drug use, HIV/AIDS, as well as same-sex sexual behavior support further integration of these efforts. The Chinese government has recognized that neglecting the connections between drug use, same-sex behavior, and HIV/AIDS ignores the possible syndemic, multiplicative, and reciprocal nature of these public health problems (Singer & Clair, 2003).

The attempts to control drug use in China in the past were similar to and coincided with attempts to control HIV/AIDS. Namely, regulations to keep HIV/AIDS out of the country, regulations to keep drugs out of the country and out of the hands of the Chinese people, and compulsory treatment and isolation for both (Wu et al., 2007; Zhao & Ling, 2012b). These "zero tolerance" policies proved ineffective and in the past few years the Chinese government has made significant progress in advancing a science-based agenda for their prevention and control. Official policy for drugs now include methadone and/or buprenorphine treatment and harm reduction methods, and has begun to change from the old system of mandatory incarceration and punishment as treatment (Li et al., 2010; Wu et al., 2007; Zhao & Ling, 2012b). For HIV/AIDS, the government has introduced the "Four Free and One Care policy" and is even strengthening this approach. The policy includes free antiretroviral drugs to AIDS patients, free voluntary counseling and testing, free drugs to HIV-infected women, free schooling for orphans resulting from parental AIDS deaths, and care and economic assistance to households with people living with HIV/AIDS (Ministry of Health the People's Republic China, 2012).

In 2008 China's National Center for AIDS/STD Prevention launched the world's largest (N = 47,231) cross-sectional study of men who have sex with men (MSM) to establish baseline HIV prevalence and behavioral profiles for these men. The national HIV prevalence among MSM is estimated to be 4.9% though with regional and local variations (Lau et al., 2011; Wu et al., 2013). The Chinese government confirms that MSM have the highest HIV/AIDS infection rate in China, make up at least 17.4% of the total cases, and have a growing incidence (Ministry of Health the People's Republic China, 2012; Wu et al., 2013). These national reports show that the current HIV/AIDS epidemic in China can be characterized by several factors including a severe epidemic in certain areas of the country, a decrease in transmission by injection drug use, sexual transmission emerging as the primary mode of transmission, and an increase in same-sex sexual transmission (Ministry of Health the People's Republic China, 2012).

Among MSM in China, research affirms high levels of multiple and concurrent sexual partners, unprotected anal intercourse, and sex with both male and female sex workers (Cai et al., 2010; Choi, Hudes, & Steward, 2008; Ruan et al., 2008; Ruan et al., 2009; Tao et al., 2008; Wong et al., 2008a; Zhang et al., 2007; Zheng, Xu, & Zhang, 2005). In addition, an emerging body of literature is finding that many Chinese MSM have sex with marital and non-marital female partners, (Choi, Gibson, Han, & Guo, 2004; Feng et al., 2010; He et al., 2006; He et al., 2009; Lau et al., 2008; Li et al., 2009; Liu, Liu, Cai, Rhodes, & Hong, 2009; Ruan et al., 2009; Wei, Guadamuz, Stall, & Wong, 2009; Xiao et al., 2010; Ying-Jun, Juan, & Hong-Bo, 2005; B. Zhang et al., 2007) which raises concerns that MSM with female partners may be acting as a bridge population for HIV infection from MSM across sexual networks (Qun He et al., 2006; He et al., 2009; Ministry of Health of the People's Republic of China, 2010). Additionally, although national reports have indicated quite high levels of last year HIV testing among MSM, a recent study of MSM has shown that less than half had ever tested, had continued high levels of risk behaviors, and face many barriers to HIV testing (Huang et al., 2012). HIV/AIDS education and behavioral interventions have the potential to tip the scales of this growing epidemic. These research findings have further increased interest for prevention and testing programming among MSM in China (Guo, Li, & Stanton, 2011; Wong et al., 2008a; Wong et al., 2009).

A subpopulation of MSM in China who sell sex to other men are known as “money boys” (MBs) (an indigenous term coined by those who practice the trade). Comparing personal demographic, behavioral, and psychosocial characteristics between MBs and general Chinese MSM has found that MBs tend to be younger (approximately 25 years of age) and earn a higher income, and are more likely to experience high levels of depression, use alcohol, engage in risky sexual behaviors, contract HIV and/or other sexually transmitted infections (STIs) (Nehl et al., 2012; Nehl, Wong, He, Huang, & Zheng, 2011; Wong et al., 2009). MBs are also more likely to be internal migrants within China who, in traveling to other cities, have less access to social support and health care benefits (Guo et al., 2011). Many of the characteristics and risk factors for disease of MBs are similar to Chinese female sex workers (Chen et al., 2012). Yet, MBs are often ignored in the conversation of sex work in China. For instance, a recent report highlighting sex work in China states that male sex workers were not included in the because of research limitations (Human Rights Watch, 2013). All of these factors have an impact on public health efforts as Chinese MSM and MBs make up a large and increasing portion of Chinese HIV/AIDS, syphilis, HIV/syphilis co-infections, other STIs and both groups are likely to also have female sexual partners (Chen, Peeling, Yin, & Mabey, 2011; Chow, Wilson, & Zhang, 2011; Guo et al., 2011; Liu et al., 2009; Wong et al., 2009; Wu et al., 2013; Zhang et al., 2007).

Although international research consistently documents relationships between drug use, sexual risk-taking, and the transmission of HIV and other STIs (Cary et al., 2009; Mathers et al., 2008; Van Tieu & Koblin, 2009), there is only an emerging body of literature concerning drug use among MSM and MBs in China. First, drug use among MSM and MBs has been found to be more prevalent than use among the general Chinese population; which is quite low (Cheng et al., 2010; Hao et al., 2004). A recent meta-analysis of HIV/syphilis and related behaviors among MSM and MBs in China found that MBs were more likely (14.8%) than general MSM (8.3%) to have ever used drugs (Chow, Iu, Fu, Wilson, & Zhang, 2012).

This finding has been relatively consistent, with MBs using drugs at nearly double the rate of general MSM (Nehl et al., 2012; Wong et al., 2010). Specific single-study articles do provide more insight into the type, distribution, and frequency of drug use. For instance, research since 2005 has found that although both hard drug use among MBs and general MSM is unusual, MBs are more likely to report the use of soft drugs (e.g., ecstasy, poppers) that are often supplied by their customers (He, Wong, Huang, Thompson, & Fu, 2007). Wong et al. (2010) found 8% lifetime use of hard (e.g., cocaine) and 10% lifetime use of soft (e.g., ecstasy) drugs among MBs and very little use among general MSM (Wong et al., 2010). More recently, the lifetime rates of drug use have been documented to be 21.0%; with most commonly used drugs being ice/methamphetamine (9.4%), ecstasy (7.9%) and other stimulants (7.0%) (Nehl et al., 2012). Mi et al. (2007) and Liu et al. (2009) also found relatively high rates of drug use among MBs, with 44% and 21% of male sex workers, respectively, reporting to have ever used drugs.

Meanwhile, little research has been conducted into drug use, sexual behaviors following substance use, and their demographic, behavioral, and psychosocial correlates among MSM in China. Therefore, the aims of this study were to (1) describe drug use, source of drugs among MBs, and drug use correlates and (2) examine relationships between drug use and sexual behaviors in general MSM and MBs in Shanghai, China.

METHODS

Study Design and Participants

The current study was part of a larger program of research designed to examine the prevalence and characteristics of HIV and three STIs (gonorrhea, herpes simplex II, and syphilis), sexual risks, related risk factors such as drug use among Chinese MSM in Shanghai. All protocols for the study underwent standard translation and back-translation (Chinese–English–Chinese), and were approved by the appropriate institutional review boards in China and U.S. Data for the current analyses were collected between January 2010 to February 2012 with the use of a pencil-and-paper cross-sectional survey in Chinese, which took between 30 and 45 min for the participant to complete. To be eligible for the study, participants must have: (1) self-identified as a male; (2) been aged 18 and above; (3) been able to give verbal and written (in Mandarin) consent; (4) ever had sex with men (oral, anal, or both); and/or (5) had sex with men in the last 12 months (oral, anal, or both).

Recruitment was done using a Community Popular Opinion Leader (CPOL) approach (Kelly, 2004; Kelly et al., 1991). CPOLs were identified, in consultation with our NGO partner through a staff selection technique (Valente & Pumpuang, 2007), who represented demographic and/or behavioral characteristics anticipated for the participant data collection (i.e., MBs and general MSM). CPOL participants were selected, invited to participate as recruiters for the study, and then trained by our community partners to recruit participants. This process resulted in 20 MB CPOLs and 20 general MSM CPOLs. Similar to other phases of the study, a standardized training was used to train the CPOLs; who were then asked to recruit ten peers each using a snowball technique (Valente & Pumpuang, 2007); each receiving US\$10 for a successful recruit.

Recruited participants were verbally informed of the nature and purpose of the study, survey procedures, the sensitive nature of the questions, confidentiality parameters, and payment for participation (US\$40 for the quantitative survey). While \$40 is sufficient for recruitment, it does not represent an undue amount by participant standards in China and is in line with comparable efforts with these populations (Nehl, Wong, He, Huang, & Zheng, 2012). Participants were also explained the risks and benefits (including referrals for other services needed), and the freedom to cease participation at any time without penalty. Upon agreement, they signed a consent form and were given a copy of the Research Subject's Bill of Rights. All consent and human subject forms and procedures had been reviewed by both of the appropriate academic institutional review boards in the US and China. All eligible participants agreed to take part in the study without any expressed reservations.

Measures

Socio-demographic Characteristics—Participants were asked to report their date of birth, present legal residency status or *hukou* (Shanghai vs. other), ethnicity (Han [the dominant ethnic group] vs. other), education level, and monthly income in Yuan (~US\$1 = 6.3 RMB at the conclusion of the study). They were also asked to disclose their current marital status and sexual orientation (openly gay or bisexual, closeted gay or bisexual, heterosexual, or other).

Drug Use—Use of any drugs *and* four specific types of drugs were assessed: stimulants or poppers, ecstasy, heroin, or white powder, and ice/methamphetamine. Methamphetamine use was measured separately from stimulant use due to linguistic conventions categorizing ice as a drug distinct from general stimulants. Participants also reported their drug use frequency per day in the past three months as “About __ times per day on average” and in the last week as “About __ per day on average.” Lastly, MBs were asked if they had ever received free drugs from their clients. Responses were re-coded into dichotomous categories (0 = No, 1 = Yes) across types to provide results for overall drug use and specific drug type use.

Sexual Behaviors after Drug Use—Sexual behaviors after drug use were assessed using two items derived from the public health literature to represent behaviors that have been found to increase the possibility of transmitting or receiving STIs. Participants were asked about their lifetime, last year and last six month sexual practices: (1) Have you ever had sex after using drugs? and (2) Have you ever had sex without a condom because you were under the influence of drugs? Responses were coded as dichotomous (0 = No, 1 = Yes) and were analyzed separately.

Depression—A modified, short-form version of the Center for Epidemiologic Studies Depression Scale (CESD-12) was used to screen for depressive symptoms (Radloff, 1977). The CES-D short-form consists of 12 self-reported items on a four point scale related to the number of days during the past week during which the participant experienced emotional or behavioral difficulty. The total score range was from 0 to 36, and higher scores indicate more depressive symptoms; scores of 0–11 indicated minimal depressive symptoms, scores of 12–20 indicated somewhat elevated depressive symptoms, and scores of 21–36 indicated very elevated depressive symptoms (Tremblay, Loeber, Gagnon, Charlebois, Larivee et al.,

1991). The CESD-12's reliability among this sample was found to be acceptable overall (Cronbach's alpha = .90) and for both participant groups (MB Cronbach's alpha for MBs = .89, Cronbach's alpha for general MSM = .88).

Attitudes Toward Sex—Sexual attitudes were assessed using 23 items from the Sexual Attitudes Scale (SAS) (Hendrick & Hendrick, 1987). Items included statements such as: (1) “I do not need to be committed to have sex;” and (2) “Sex is best when you let yourself go and focus on your own pleasure.” Participants were instructed to frame their responses based on their current partner, their most recent partner, or what they thought their response would be (if they never had a partner). Response options were modified from the original five-point into a seven-point scale ranging from (1) strongly disagree to (7) strongly agree. Responses to the items were reverse-coded and summed to create an overall score, with lower being generally more sexually permissive and open about sexuality. Reliability was found to be acceptable overall (Cronbach's alpha = .82) and for both participant groups (Cronbach's alpha for MBs = .81, Cronbach's alpha for general MSM = .83).

Gay Identity—Gay identity was assessed using 27 items from the Lesbian and Gay Identity Scale (LGBIS) (Mohr & Fassinger, 2000). This scale was developed to assess unique aspects of the gay experience related to identity and disclosure including statements such as: (1) “I prefer to keep my same-sex romantic relationships private” and (2) “I will never be able to accept my sexual orientation until all of the people in my life have accepted me.” Items were rated on a seven-point scale from (1) disagree strongly to (7) agree strongly and were averaged for an overall LGBIS score. Reliability was found to be acceptable overall (Cronbach's alpha = .82) and for both participant groups (Cronbach's alpha for MBs = .82, Cronbach's alpha for general MSM = .83).

Data Analysis

The primary aims of this study were to (1) describe drug use and (2) examine concurrent sexual behaviors and sexual behaviors after drug use among general MSM and MBs in Shanghai, China. First, descriptive statistics were used to characterize personal demographic traits, drug use, and substance use before sex patterns in the sample. Second, one-way ANOVAs—with participant type (general MSM or MB) as the between-subjects factor for continuous variables and chi-squares for categorical variables—were used to compare participant groups. Similar analyses were conducted to explore the associations between drug use and substance use before sex, demographic traits, and psychosocial scales. Spearman and Pearson correlation coefficients were generated and used to determine which demographic and psychosocial predictors were to be entered into our final analyses. Factors entered into the final models were first assessed to determine their suitability for entry into multivariate analysis, use a selection criterion of $p < .05$. The final models were used to explore the demographic, behavioral, and psychosocial variables associated with drug use at each time period when sufficient numbers allowed. Lastly, logistic regressions were used to explore associations between drug use, psychosocial variables, and sex after drug use.

RESULTS

Preliminary Analysis

Examining demographics of the sample by type of CPOL recruiter revealed very little cross-group recruitment. That is, MBs recruited other MBs into the study and general MSM recruited other general MSM into the study. There were only four participants recruited across these characteristics (one general MSM recruited by a MB, three MBs recruited by general MSM). Of the 40 recruiters in the study the majority recruited the 10 participants they were asked to recruit. One recruited nine participants, one recruited 11, and one recruited 12 resulting in 402 total participants for the study. Examining drug use by recruiter revealed higher concentration of drug use by four MB recruiters; seven (70%) of recruits from one MB recruiter and five (50%) of recruits from three other MB recruiters had used drugs in the past.

As can be seen in Table 1, among the 402 participants the average age was 27.7 years old ($SD = 7.9$), 95.0% were of Han ethnicity, 24.0% reported Shanghai to be their hometown (*hukou*), 66.9% had a high school education or less, 12.4% were married, only 7.7% were openly gay or bisexual, 23.6% had both male and female sexual partners in the past year (27.1% of MBs vs. 20.1% of general MSM), and 9.5% had both male and female sexual partners in the past month (10.8% of MBs vs. 8.0% of general MSM).

Although often found to be quite different groups based upon occupation and other demographic characteristics (Nehl et al., 2012), Table 1 confirms that in this study MBs were younger, had their first sexual experience with a male at an earlier age, unmarried, and were more likely to be a migrant to Shanghai (*hukou* variable). MBs were also found to be less educated but were also less likely to have their sexual orientation closeted and tended to make more money than their general MSM counterparts. The psychosocial constructs of depression and gay identity were also statistically different between groups, with MBs reporting higher levels of depression and more likely to endorse themselves as having a positive gay identity.

Correlations revealed that age, age at first male sexual experience, monthly income, and participant type (MB vs. general MSM) were significantly and consistently correlated to lifetime and three-month drug use. *Hukou* was not included in the main analyses because of high multicollinearity with the MB/general MSM status (MBs were very likely to be migrants).

Drug Use

One of the primary aims of this study was to describe drug use among the sample. As can be seen in Table 2a, 16.7% of participants reported ever using drugs in their lifetime. The most commonly used drug was stimulants (13.9%), followed by ice/methamphetamine (4.5%), ecstasy (1.0%), and heroin (0.2%). MBs were found to be statistically more likely to have ever used drugs (26.6% vs. 6.5%), used drugs within the past three months (22.2% vs. 4.0%), and used drugs in the past week (10.8% vs. 2.5%) relative to general MSM. MBs also reported greater lifetime use of stimulants (21.7% vs. 6.0%) and ice/methamphetamine (7.9% vs. 1.0%). They also were marginally more likely to use ice in the past week (2.0%

vs. 0%). Stimulants were the drug-of-choice among both groups. Overall, heroin use was scarce regardless of time period concerned (lifetime, three months, or in the past week). Lifetime use of ecstasy and heroin was relatively equal for MBs and general MSM. Last, 42 (20.7%) of the MBs in this study reported that they had ever received free drugs from their clients. Put another way, 88.1% who had ever used any drugs (76.2% ever stimulants), 85.7% who had used any drugs in the past three months (71.4% three month stimulants), and 47.6% MBs who had used any drugs in the past week (35.7% stimulants in the past week) had received free drugs from their clients (Table 2b). These descriptors indicate a significant source of drug supply and risk for MBs.

Although we assume that the drug use comparisons between MBs and general MSM would be most helpful to understanding our research questions we also sought to explore drug use by other categorizing characteristics. First, we found a statistically significant difference for overall lifetime drug use by hukou, with those from outside Shanghai having more overall drug use than those with Shanghai hukou (20.1% vs. 6.3%; $\chi^2(1) = 9.99, p < .01$). This also held for ever stimulant use ($p < .05$) and ice use ever ($p < .05$), drug use in the past three months ($p < .001$) and stimulant use in the past three months ($p < .01$). For sexual orientation, those closeted were less likely (14.5%) to report ever using drugs vs. those openly gay/bisexual (25.8%) and heterosexual/other (28.2%) ($\chi^2(2) = 9.06, p < .05$). This held for both ice ecstasy ($p < .01$) and ice ever ($p < .01$), overall drug use at three months ($p < .05$), stimulants ($p < .05$) and ice in the past three months ($p < .001$), and ice in the past week ($p < .05$), with those closeted being less likely to report ever using. By ethnicity, those of Han ethnicity (3.7%) were less likely than other ethnicities (20.0%) to report ever using ice ($\chi^2(1) = 11.73, p < .01$) and use ice in the past 3 months ($p < .01$). For education, those with middle school (19.2%) or high school educations (24.0%) were more likely than those illiterate/primary school (6.7%) and college or above (7.5%) to use drugs ever ($\chi^2(3) = 15.39, p < .01$), stimulants ever ($p < .05$), ice ever ($p < .001$), drugs in the past three months ($p < .01$), and stimulants in the past three months ($p < .05$). Those with the highest incomes 5,000 RMB per month (26.3%) were more likely than those who made less RMB to use drugs ever ($\chi^2(3) = 11.37, p < .05$), use ecstasy ever ($p < .01$), use ice ever ($p < .001$), and to use ice in the past three months ($p < .01$). By age, those younger ($M = 25.6, SD = 6.33$) were more likely to have ever used drugs than older men ($M = 28.11, SD = 8.17$) ($F = 5.85, p < .05$) use drugs in the past three months than older men ($p < .05$), and to have used stimulants in the past three months than older men ($p < .05$). Similarly, those who had sex with other men at a younger age ($M = 17.22, SD = 3.77$) were more likely to ever use drugs than older men ($M = 19.23, SD = 5.71$) ($F = 7.57, p < .01$), to ever use stimulants ($p < .05$), to use drugs in the past three months ($p < .05$), to use stimulants in the past three months ($p < .05$), to use drugs in the past week ($p < .05$), and to use stimulants in the past week than older men ($p < .01$). Last, those with higher levels of depression ($M = 14.44, SD = 7.12$) were more likely to ever use ice than those with lower levels of depression ($M = 10.01, SD = 7.20$) ($F = 6.55, p < .05$) and those with higher levels of depression and to use ice in the past three months than those with lower levels of depression ($p < .01$).

Sexual Behaviors After Drug Use

The second aim of the study was to examine the relationship between sexual behaviors and drug use among the sample. We found that 12.5% of participants ever had engaged in sex after drug use and 16.9% reported sex without using a condom because of drug use. MBs (21.3%) were more likely than general MSM (3.6%) to have ever engaged in sex after drug use ($\chi^2(1) = 28.62, p < .001$) and were more likely to have sex without a condom because of drug use (27.5% vs. 6.1%; $\chi^2(1) = 16.36, p < .001$). Sex after drug use was much lower in the past year and six months, with less than 1% of both MBs and general MSM reporting both behaviors. Even more troubling, the overwhelming largest percentage of MBs who had sex after using drugs (80.5%) and having sex without a condom because of drug use (55.3%) reported receiving free drugs from their clients.

Multivariate Analysis

Table 3 shows results from sequential logistic regressions using multiple correlates of drug use to predict drug use among the sample. Not all demographic factors were included in the final model due to high correlations among the factors. Specifically, the associations between drug use, demographics, and psychosocial scales were assessed prior to being entered into the final model. For several drug use categories and time periods there was insufficient drug use to allow for multivariate analyses. The prevalence of lifetime drug use was 4.66 times greater among MBs than among general MSM. Participants who earned between 1,000 and 2,999 RMB per month had a 0.35 times lower odds of lifetime drug use and participants who earned from 3,000 to 4,999 RMB per month had a 0.44 times lower odds of lifetime drug use relative to participants who earned 5,000 RMB or greater per month. MBs were also 3.52 times more likely than general MSM to have report lifetime stimulant use. Those who earned between 1,000 and 2,999 RMB per month had a 0.25 times lower odds of lifetime ice use and participants who earned from 3,000 to 4,999 RMB per month had a 0.48 times lower odds of lifetime ice use relative to participants who earned 5,000 RMB or greater per month. For three-month reports, MBs were 4.95 times more likely to have used drugs and 6.45 times more likely to have use stimulants in the past 3 months than MSM. Similarly, MBs were 3.61 times more likely to report using any drugs and 3.80 times more likely to have used stimulants in the past week. Other factors did not contribute to explaining drug use in this sample. None of the three psychosocial variables analyzed in this study, including depression, sexual attitudes and gay identity were significantly associated with drug use. However, an effect modification of being a MB or general MSM may exist: bivariate analyses showed statistically significant differences between drug use categories and MB vs. general MSM for several variables and it may be that these differences were not significant in the regressions due to small sample sizes in each group.

Sequential logistic regressions were also used to predict sexual behaviors after drug use. The prevalence of lifetime sex after drug use was 7.24 times greater (95%CI 2.73, 19.24; $p < .001$) among MBs than among general MSM. Participants who earned between 1,000 and 2,999 RMB per month had a 0.19 (95%CI 0.12, 0.48; $p < .01$) times lower odds of lifetime drug use and participants who earned from 3,000 to 4,999 RMB per month had a 0.32 (95%CI 0.15, 0.67; $p < .01$) times lower odds of lifetime sex after drug use relative to participants who earned 5,000 RMB or greater per month. MBs were also 4.65 (95%CI 1.49,

14.53; $p < .01$) times more likely than general MSM to have report lifetime unprotected sex because of drug use. Similar to drug use, none of the three psychosocial variables were significantly associated with sexual behaviors after drug use.

DISCUSSION

The primary aims of this study were to describe drug use and examine sexual behaviors after drug use among general MSM and MBs in Shanghai, China. We also aimed to explore demographic, behavioral, and psychosocial correlates of sex drug use. These questions were posed to a sample of participants who were recruited using CPOL sampling. This is considered to be an exploratory analysis of substance use and psychosocial scales for the money boy and MSM population in Shanghai. These results reveal the details of drug use of this under-researched and undertreated population.

As with other studies among Chinese MSM, we found drug use to be higher among Chinese general MSM and MBs than among the general population (Cheng et al., 2010; Hao et al., 2004). The current results did show less lifetime drug use than were reported in data collected from Shanghai in 2009 (Nehl et al., 2012), but still higher than drug use collected in 2006 (Wong et al., 2010; Wong et al., 2008b). Similar to the findings of Wong et al. (2010) and Nehl et al (2012), greater monthly income appeared to increase the odds of a participant engaging in lifetime drug use (Wong et al., 2010).

The current study also showed that drug use among the MB subgroup can be considered substantial, with over 25% reporting lifetime use and MBs exceeding use among general MSM by over 20%. Further, the prevalence of drug use among MBs was reported to be nearly double that of general MSM (ever, in the past three months, and in the past week) and was somewhat consistent with a report among MBs in Shanghai (Nehl et al., 2012). The current findings also seem to fit in the midrange of similar samples of male sex workers in Beijing/Qingdao City (44% had ever used drugs) and Shenzhen (21% had ever used drugs) (Liu et al., 2009; Mi et al., 2007).

One important feature of this study is the inclusion of three-month and past-week drug use. Few studies of general MSM and MBs in China have reported anything other than lifetime estimates of use. A large proportion of the men who reported lifetime use also reported use in the past three months and approximately half of the lifetime users reported using in the past week. This suggests a stable core of drug use over time, especially among MBs. Results from this study also indicated very low levels of drug use other than stimulants and our overall “drugs” category. Lifetime reports of ice/methamphetamine, ecstasy, and heroin were all under 5% for general MSM and under 10% for MBs. Compared to previous research in this population, lifetime overall drug use and ecstasy were found to be quite low (Guo, Li, & Stanton, 2011; Nehl et al., 2012). However, lifetime, three-month, and past-week stimulant use was found to be higher in this sample than found previously (Nehl et al., 2012). Conversely, three-month rates of ecstasy and ice use were shown to be much lower than previous research, past week reports of ice use were also lower than found before, and past week ecstasy and heroin use were similar and nonexistent respectively (Nehl et al., 2012).

This sample indicated a relatively small distribution of drug use type, with most reporting across time periods that the drug that they used was a stimulant. This is quite different than previous findings in which ice and ecstasy were the most commonly used drugs (Nehl et al., 2012). Although a novel finding for MSM and MBs in Shanghai, high rates of stimulant use has often been associated with MSM; specifically high risk sexual behavior and HIV seroconversion among MSM in international research (Carey et al., 2009; Colfax et al., 2010; Mimiaga et al., 2010; Plankey et al., 2007). Reasons that MSM have listed for stimulant use include sexual enhancement (including better sex, more sex, and more anal sex specifically), to increase overall energy levels, enhance social connections, to help cope with stress, and to increase productivity at work (Díaz, Heckert, & Sánchez, 2005). Research in China has also shown that the use of stimulants (amphetamines, methamphetamine) is increasing to epidemic levels (Commission). Recent studies have also linked stimulant use to Chinese female sex workers, HIV/STIs, and sex risks in China (Bao et al., 2012; Commission; Hong & Li, 2008; Kang et al., 2011; Liao et al., 2011; Liao et al., 2013). It is not clear if the current findings represent a trend of increasing stimulant use specific to Chinese MSM, if stimulant use in China is related to selling sex, or reflect the increases seen throughout China. Future research and programmatic efforts through NGOs and AIDS service organizations is warranted to examine these findings.

An unexpected but nevertheless very important finding in this study was the degree to which MBs reported receiving free drugs from their clients. There are strict supply-side regulations in place in China for distribution of illegal drugs. However, MBs still reported receiving drugs from their clients at a particularly high rate. Although this has been reported this before in a previous study (Nehl et al., 2012), we further explored drug supply from clients and found that this is the dominant form of drug supply among MBs. A quarter of the MBs in this study reported ever using drugs. An almost equal number reported receiving drugs for free from their clients. Although we cannot determine if drugs received free from clients were the only source for those MBs, it is nonetheless see a significant source of drug supply. Research from an earlier qualitative study revealed that clients who provided drugs were more likely to be foreign nationals (He et al., 2007). Anecdotal evidence from community partners and conversations with individual MBs also indicates that clients who supply drugs are often foreign nationals, typically from Japan and Taiwan. It will be important that future studies further examine our findings of drugs being supplied by the clients of MBs. For instance, it is not clear if the provision of drugs was given as part of the encounter (e.g., such as to increase desire or pleasure) or possibly as payment in exchange for sex. Research should also examine the contexts in which the drug / sex interactions occur and the underlying reasons for this type of behavior. As China continues to open to outside countries and the global economy this source of drug and sex trade will likely play a role in exposure to drugs and sexual HIV/STI risks.

Our study did not find an association between drug use and the psychosocial variables measured in this study. Specifically, the individual-level constructs of depression, sexual attitudes, and gay identity, were not predictive of lifetime drug use. Some previous research has shown these factors to be pertinent to drug, alcohol and tobacco use behaviors among Chinese MSM in Shanghai (Berg et al., 2011; Nehl et al., 2011; Wong et al., 2010; Yu et al., 2013). However, the most recent study among Chinese MSM and MBs also did not find

psychosocial associations with drug use (Nehl et al., 2012). One possible explanation is that it is possible that the drug use in this sample was more related to sex acts or experimentation. The current study did not assess drug dependence and in-depth motivations for drug use. It is important that future studies probe into these issues.

The participant recruitment mechanism in studies of Chinese MSM may be very important to consider. Earlier research using respondent-driven sampling (RDS) found quite higher rates of drug use (Nehl et al., 2012). RDS was designed for, and has a reputation for recruiting hard-to-reach groups (Heckathorn, 1997, 2002; Magnani, Sabin, Sidel, & Heckathorn, 2005; McCreesh et al., 2012). The success of both of these methods often depends on the recruitment seeds selected and the instructions that are given to them in the training phase of recruitment (i.e., recruit others based upon certain characteristics). Although RDS and CPOL methods are under the same umbrella of snowball sampling, CPOL recruiters may be more closely aligned with community organization, community improvement, or public health efforts. Hence, they are known as community public opinion leaders. An important line of future research will be to determine the relative merits of both RDS and CPOL recruitment methods, in addition to other methods used to recruit within specific high-risk groups.

Despite the promising findings presented here, several limitations must be acknowledged. First, this study relied on self-reported behaviors, which no doubt yielded some bias in the results. Future studies should attempt to use objective and multiple measures of behavior when possible. Second, detection of significant statistical differences could be due to the small sample size. Third, this study was based upon data gathered in Shanghai, an advanced urban city with roughly 20 million residents. It is likely that drug use varies across China due to the diversity both within society and across different MSM communities (e.g., nascent vs. well-established) in China. Therefore, future studies should be extended other setting such as rural and smaller city settings. Fourth, the recruitment analysis in this study was limited to the linkages among study participants, their recruiter, and descriptions of drug use by these groups. Future efforts should consider a more diverse selection of CPOL recruiters, the interconnections and behaviors within these recruitment groups, and any relationships within and across these recruitment groups. Finally, the study's cross-sectional approach was appropriate given its exploratory nature. Future studies should include repeated measurements to predict drug use behavior over time.

IMPLICATIONS

The Chinese government has not paid sufficient attention to drug use and HIV risks among MSM and MBs. Stimulant use is relatively high among Chinese MBs and, to a lesser extent, among general MSM. A large portion of the current sample received drugs from their clients and those MBs were also more likely to report sex after drug use. The current findings emphasize that Chinese MSM and MBs are a high risk group and should be considered in public health drug and HIV/STI prevention/interventions. In comparison to high risk MSM in the United States, 34% of Black American MSM have reported using stimulants during sex on a monthly basis over the last year, and were 2.61 times more at odds of having unprotected male sex with a casual male partner (Mimiaga et al., 2010). Similarly, Latino

gay men in San Francisco reported using stimulants to have better sex, and more anal sex (Diaz, Heckert, & Sanchez, 2005). As described by Diaz et al. (2005), methamphetamine users are more likely to be HIV positive. As many studies have indicated, there is a need for increased incorporation of stimulant use prevention programs targeted toward men who are at risk of contracting HIV, or are already HIV positive (Díaz et al., 2005; Hirshfield, Remien, Humberstone, Walavalkar, & Chiasson, 2004; Metzger & Navaline, 2003; Mimiaga et al., 2010; Plankey et al., 2007).

This study found that sexual behaviors after drug use were common among both MBs and general MSM. Sexual contact among MSM is currently the primary means of HIV transmission in China and MSM make up the largest percentage of those who are responsible for both types of transmission (Wong et al., 2009), which has led to consistent calls for increased individual screenings and surveillance among MSM (Wu et al., 2007). Given that both general MSM and MBs often are married and /or have concurrent sexual relationships with women, the potential for “bridging” transmission is quite high. These findings highlight the importance of considering the influences of multiple health behaviors and situations within the same study.

While China has attempted to control illicit drug use in the country through laws, like “The Anti-drug Law of the People’s Republic of China,” and compulsory detoxification programs after initial detection of drug use, its focus on drug use prevention and sexual behavior education programs has been lacking (Zhao & Ling, 2012a). A cross sectional study in the Anhui province of China assessed the effects of frequent admissions to detoxification treatment centers among men and women. Liu et. al (2006) found that these treatments did not result in change of their risky drug use or sexual behavior. They suggested behavioral interventions and substitution maintenance be integrated with detoxification programs (Liu, Grusky, Zhu, & Li, 2006). Clearly, the interrelated concepts of substance use, sexual risk behaviors, multiple sexual partnerships, and health outcomes remain significant public health concepts in China. Researchers and public health officials must recognize that effective prevention programs must address all of these elements simultaneously in order for interventions to work effectively.

A framework that could be applied to a multifaceted intervention that aims to reduce substance use, while also reducing the incidence and transmission of HIV among Chinese MSM is the Community Coalition Action Theory (CCAT) (Butterfoss & Kegler, 2002; Kegler & Swan, 2011). The researchers of this study have developed a lead agency and have gained the support of CPOL members, participating members of the MSM and MB community, support staff and leadership from Shanghai Piaoxue Cultural Media Limited, and possess a contextual understanding of community norms and values. Consequently, a community coalition could be formed to develop a multifaceted intervention that aims to reduce risky sexual behavior and substance use that prevents further transmission of HIV among MSM and MBs in Shanghai, China. Tailoring substance use prevention and sexual behavior education programs to effectively account for the environmental, professional, and psychosocial realities of everyday life of men who sell sex to other men is an essential first step to better the health outcomes of the MSM community in Shanghai, China.

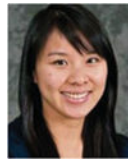
Biographies



Eric J. Nehl, PhD, He is an Assistant Research Professor in the Department of Behavioral Sciences and Health Education at the Emory University Rollins School of Public Health. His research interests center around health behavior research, health education, and substance use prevention.



Na He, MD, PhD, He is a professor of Epidemiology and Co-Dean of Fudan University's School of Public Health; and also holds an appointment as an adjunct professor in the Department of Behavioral Sciences and Health Education at Emory University's Rollins School of Public Health. In addition to investigating HIV risks among MSM, he also has ongoing research funded by the Chinese federal government focusing on HIV/AIDS treatment and care.



Lavinia Lin, MPH, She is a senior research project coordinator in the Department of Behavioral Sciences and Health Education, Emory University Rollins School of Public Health in Atlanta, Georgia, USA. She received her MPH from Emory University and BSc in Nutritional Sciences from the University of Toronto. Her primary research interests include preventive health behaviors among minorities and underserved populations, specifically STI/HIV research.



Tony Zheng is the general manager of Shanghai Piaoxue, an NGO providing sexual health prevention and intervention to sexual minorities and commercial sex workers.



Jessica A. Harnisch, MPH, She is a recent graduate of the Emory University Rollins School of Public Health, and previously received her B.S. in Neuroscience from UCLA. Her master's thesis was written on the psychosocial correlates that exist among men who have sex with men and money boys in Shanghai, China.



Yingying Ding, PhD, He is a Lecturer in the Department of Epidemiology at the Fudan University's School of Public Health. His research interests are on new type drug use and HIV risks in China as well as HIV infection and aging among Chinese.



Frank Y. Wong, PhD, He is an Associate Professor in the Department of Behavioral Sciences and Health Education with a joint appointment in the Hubert Department of Global Health at the Emory University's Rollins School of Public Health. His domestic and international research focuses on sexual risks among sexual minorities, especially among men who have sex with men.

GLOSSARY

Community Popular Opinion Leader (CPOL) recruitment

A form of participant recruitment that utilizes existing community leaders to recruit members of the community into a study or program.

Depression

A mood that causes a person to display a set of symptoms that affect their appetite, relationships with others, motivation, attention span, emotions, and behavior.

Drug use

Use of any drugs and four specific types of drugs were assessed: stimulants or poppers, ecstasy, heroin or white powder, and ice/methamphetamine.

Ecstasy

The common name for, 3,4-methylenedioxy-*N*-methylamphetamine (MDMA). Gay identity: As assessment of an individual's sexual orientation, acceptance of their sexual preference, view of other's sexual identity, and disclosure to of their sexual orientation.

Heroin/“white powder”

An opioid analgesic found in the opium poppy (*Papaver somniferum*). White powder is the street name for heroin in Shanghai.

HIV

Human immunodeficiency virus, the virus that causes acquired immunodeficiency syndrome (AIDS).

Methamphetamine/“ice”

A psychostimulant that is commonly known as “ice” in Shanghai. Men who have sex with men: A population of men that have sex with other men, but do not necessarily identify as homosexual or bisexual.

Money boys

A subpopulation of MSM in China who sell sex to other men are known as “money boys,” which is an indigenous term coined by those who practice the trade.

Sexual attitudes

A participant’s attitude toward sex with a partner, assessed by their permissiveness, attitude toward who holds the responsibility for birth control, communion in the relationship, and instrumentality of sex.

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TABLE 1. Personal demographic characteristics and scale scores among money boys and general MSM

Variable	Overall (N = 402)	Money Boys (n = 203)	General MSM (n = 199)	Significance
	M(SD)	M(SD)	M(SD)	
Age	27.7 (7.9)	24.7 (4.9)	30.7 (9.2)	$F = 66.08, p < .001$
Age at 1st MSM experience	18.9 (5.5)	17.4(4.0)	20.4 (6.3)	$F = 33.80, p < .001$
<i>Hukou</i>	n (%)	n (%)	n (%)	
Shanghai	96 (24.0)	5 (2.5)	91 (45.7)	$\chi^2 (1) = 102.51, p < .001$
Other	304 (76.0)	196 (97.5)	108 (54.3)	
Sexual Orientation				
Openly Gay / Bisexual	31 (7.7)	13 (6.4)	18(9.0)	$\chi^2 (2) = 34.22, p < .001$
Closeted Gay / Bisexual	332 (82.6)	153 (75.4)	179 (89.9)	
Heterosexual or Other	39 (9.7)	37 (18.2)	2(1.0)	
Ethnicity				
Han	379 (95.0)	191 (94.6)	188 (95.4)	$\chi^2 (1) = 0.16, p = .69$
Other ethnicity	20 (5.0)	11 (5.4)	9 (4.6)	
Education				
Illiterate / Primary school	15 (3.7)	13 (6.4)	2(1.0)	$\chi^2 (3) = 150.11, p < .001$
Middle School	104 (25.9)	79 (38.9)	25 (12.6)	
High School or Equal	150 (37.3)	101 (49.8)	49 (24.6)	
College or Above	133 (33.1)	10 (4.9)	123 (61.8)	
Marital Status				
Never Married	328 (83.0)	179 (90.9)	149 (75.3)	$\chi^2 (2) = 18.11, p < .001$
Currently Married	49 (12.4)	15 (7.6)	34(17.2)	
Divorced / Widowed	18 (4.6)	3(1.5)	15 (7.6)	
Income				
<1000	29 (7.3)	2(1.0)	27 (13.6)	$\chi^2 (3) = 25.69, p = .001$
1000–2999	112(28.0)	60 (29.7)	52 (26.3)	
3000–4999	164 (41.0)	94 (46.5)	70 (35.4)	
> = 5000	95 (23.8)	46 (22.8)	49 (24.7)	

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Variable	Overall (N = 402)	Money Boys (n = 203)	General MSM (n = 199)	Significance
Depression	10.2(7.2)	12.4(7.5)	8.0 (6.2)	$F = 40.30, p < .001$
Attitudes about Sex	74.1 (17.7)	74.3 (17.2)	74.0 (18.2)	$F = 0.04, p = .85$
Gay Identity	4.1 (.76)	4.2 (.75)	4.0 (.76)	$F = 6.70, p < .05$
Male and Female Sexual Partners				
Last Month	38 (9.5)	22(10.8)	16 (8.0)	$\chi^2 (1) = 0.92, p = 0.34$
Last Year	95 (23.6)	55 (27.1)	40 (20.1)	$\chi^2 (1) = 2.72, p = .10$

Note: N varies based on missing responses.

TABLE 2A.

Drug use among money boys and general MSM

	Overall (N = 402) n (%) yes	Money Boys (N = 203) n (%) yes	General MSM (N = 199) n (%) yes	Significance
Drugs				
-Ever	67 (16.7)	54 (26.6)	13 (6.5)	$\chi^2 (1) = 29.14, p < .001$
-3 months	53 (13.2)	45 (22.2)	8 (4.0)	$\chi^2 (1) = 28.91, p < .001$
-Weekly	27 (6.7)	22(10.8)	5 (2.5)	$\chi^2 (1) = 11.12, p < .01$
Stimulants				
-Ever	56 (13.9)	44 (21.7)	12(6.0)	$\chi^2 (1) = 20.5, p < .001$
-3 months	47 (11.7)	40 (19.7)	7 (3.5)	$\chi^2 (1) = 25.5, p < .001$
-Weekly	21 (5.2)	17 (8.4)	4 (2.0)	$\chi^2 (1) = 8.2, p < .01$
Ecstasy				
-Ever	4(1.0)	3(1.5)	1 (.5)	—
-3 months	1 (.2)	1 (.5)	0(0)	—
-Weekly	1 (.2)	1 (.5)	0(0)	—
Heroin				
-Ever	1 (.2)	0 (.0)	1 (.5)	—
-3 months	0 (.0)	0 (.0)	0 (.0)	—
-Weekly	0 (.0)	0 (.0)	0 (.0)	—
Ice				
-Ever	18 (4.5)	16(7.9)	2(1.0)	—
-3 months	8(2.0)	8 (3.9)	0 (.0)	—
-Weekly	4(1.0)	4 (2.0)	0 (.0)	—

TABLE 2B.

Money boys' attainment of drugs from a client

	Yes: <i>n</i> (%)	Significance
Ever Received Drugs from a Client, if Having Ever Reported Using Drugs	42 (20.7)	—
Money Boys' receipt of drugs from a client		
Drugs		
-Ever	37 (88.1)	$\chi^2 (1) = 102.57, p < .001$
-3 months	36 (85.7)	$\chi^2 (1) = 116.49, p < .001$
-Weekly	20 (47.6)	$\chi^2 (1) = 74.14, p < .001$
Stimulants		
-Ever	32 (76.2)	$\chi^2 (1) = 92.71, p < .001$
-3 months	30 (71.4)	$\chi^2 (1) = 89.55, p < .001$
-Weekly	15 (35.7)	$\chi^2 (1) = 51.59, p < .001$

TABLE 3. CPOL logistic associations between three month, weekly, and lifetime drug use, demographic, behavior, and psychosocial scales

	Adjusted OR (95% CI)						
	3 Month Drug Use	3 Month Stimulant Use	Week Drug Use	Week Stimulant Use	Lifetime Drug Use	Lifetime Stimulant Use	Lifetime Ice Use
Money Boy	4.95 (2.13, 11.52) ^{***}	6.45 (2.43, 17.12) ^{***}	3.61 (1.13, 11.54) [*]	3.80 (1.01, 14.30) [*]	4.66 (2.16, 10.07) ^{***}	3.52 (1.58, 7.83) ^{***}	6.48 (1.20, 34.96) [*]
Income (< 1,000)	.28 (.04, 2.61)	.51 (.06, 4.50)	—	—	.19 (.02, 1.56)	—	—
Income (1,000–2,999)	.38 (.16, .89) [*]	.45 (.18, 1.12)	.25 (.07, .85) [*]	.44 (.12, 1.63)	.35 (.16, .76) ^{**}	.25 (.03, 2.12)	.05 (.01, .36) ^{**}
Income (3,000–4,999)	.64 (.31, 1.29)	.66 (.30, 1.43)	.41 (.16, 1.05)	.55 (.18, 1.69)	.44 (.23, .87) [*]	.48 (.21, 1.10)	.09 (.02, .34) ^{***}
Age	1.00 (.95, 1.06)	1.02 (.96, 1.08)	1.00 (.93, 1.08)	1.02 (.95, 1.11)	1.00 (.95, 1.05)	1.01 (.96, 1.06)	.93 (.82, 1.05)
First Male Sexual Experience	.94 (.88, 1.01)	.94 (.86, 1.02)	.92 (.83, 1.02)	.87 (.77, .97)	.95 (.89, 1.02)	.95 (.88, 1.02)	1.05 (.92, 1.20)
Somewhat Elevated Depressive Symptoms	.85 (.43, 1.70)	.77 (.36, 1.64)	1.53 (.62, 3.78)	1.19 (.43, 3.26)	.95 (.49, 1.83)	.99 (.50, 1.98)	2.23 (.63, 7.82)
Very Elevated Depressive Symptoms	.97 (.36, 2.64)	.70 (.23, 2.14)	.28 (.03, 2.42)	—	1.29 (.51, 3.27)	1.41 (.54, 3.70)	3.67 (.79, 17.06)
Gay Identity	.96 (.63, 1.46)	1.08 (.69, 1.71)	.91 (.50, 1.66)	.88 (.45, 1.71)	.81 (.54, 1.20)	.96 (.64, 1.50)	.74 (.33, 1.66)

^{***} $p < .001$
^{**} $p < .01$
^{*} $p < .05$.