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## Substance use and sexual risk behaviors among Peruvian MSM social media users

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### Abstract

Peru is experiencing a concentrated HIV epidemic among men who have sex with men (MSM). Substance use (alcohol and drug use) has been found to be associated with HIV-related sexual risk behaviors. A recent surge in the number of social media users in Peru has enabled these technologies to be potential tools for reaching HIV at-risk individuals. This study sought to assess the relationship between substance use and sexual risk behaviors among Peruvian MSM who use social media. A total of 556 Peruvian MSM Facebook users (ages 18–59) were recruited to complete a 92-item survey on demographics, sexual risk behaviors, and substance use. We performed a logistic regression of various sexual risk behaviors (e.g. unprotected sex, casual sex) on substance abuse, including alcohol, adjusting for potential covariates. Drinking more than five alcoholic drinks a day in the past three months was associated with an increased odds of having unprotected sex (vaginal and anal) (aOR: 1.52; 95%CL: 1.01, 2.28), casual sex (1.75; 1.17, 2.62) and sex with unknown persons (1.82; 1.23, 2.71). Drug use was not significantly associated with sexual risk behaviors. Among Peruvian MSM social media users, findings suggest that alcohol use was associated with increased HIV-related sexual risk behaviors.

### Keywords

Men who have sex with men (MSM); Peru; HIV; substance use; sexual risk behavior

## Introduction

Peru is experiencing a concentrated HIV epidemic that disproportionately impacts men who have sex with men (MSM) (Curioso & Kurth, 2007; Tabet et al., 2002). It has been estimated that the prevalence of HIV among Peruvian MSM is above 12% (Noriega et al., 2012), and this is particularly salient in large urban areas, such as Lima (Sanchez et al., 2007). Sexual risk behaviors (e.g., unprotected sexual intercourse) are a major mode of HIV transmission among MSM, particularly unprotected anal intercourse (UAI). Studies have shown that MSM are more likely to practice UAI (both insertive and receptive), have more sexual partners, and engage in a greater frequency of transactional sexual encounters in comparison to exclusively heterosexual men (J. L. Clark et al., 2007; J. Clark et al., 2008).

In the United States, an important factor that has been found to be associated with sexual risk behaviors is substance use, including alcohol and drug use. Among MSM, over 60% had an alcohol use disorder (Ludford et al., 2013), and alcohol use was associated with increased odds of having unprotected insertive and receptive intercourse by 20% and 50%, respectively (Celentano et al., 2006). Some studies further suggest that alcohol use is related to increased odds of serodiscordant unprotected anal intercourse (Colfax et al., 2004), and ultimately, HIV seroconversion (Fisher, Bang, & Kapiga, 2007). While drug use is not as common (Ludford et al., 2013), drug use (e.g. marijuana, amphetamines, poppers, and methamphetamines) has been associated with unprotected anal intercourse (receptive and insertive) (Celentano et al., 2006; Ludford et al., 2013; Stueve, O'Donnell, Duran, San Doval, & Geier, 2002), having multiple sexual partners (Ludford et al., 2013), having sex with someone of unknown HIV status (Colfax et al., 2005; Colfax et al., 2004), engaging in sex work (Ludford et al., 2013), and seroconversion (Chesney, Barrett, & Stall, 1998). Although limited research has focused on this topic in Peru, alcohol use is highly prevalent in Peru, especially among men (Gálvez-Buccollini, Paz-Soldán, Herrera, DeLea, & Gilman, 2009).

Social media use is rapidly increasing among Peruvians (Chase, 2013; “New Media and Peru’s Youth and Young Adults,” 2009). In the United States, these technologies have been shown to facilitate both sexual risk (Sean D. Young, Szekeres, & Coates, 2013), as well as to provide the ability for HIV prevention interventions to reach a large number of HIV at-risk individuals (S. Young et al., 2013). In Peru, 76% of youth (young adults, ages 15 to 29) and 60% of adults report using social media in the past month (“New Media and Peru’s Youth and Young Adults,” 2009). In 2011, there were more than 8 million Peruvian Facebook users, and the penetration rate was 28.1% (“Social Networking,” 2013). Because social media sites allow users to communicate with each other without face-to-face contact, these technologies might be especially useful methods for reaching MSM heavily affected by stigma who do not visit physical (in-person) health centers. Studying the newly growing group of Peruvian social media users at high-risk for HIV would help to improve understanding of HIV epidemiology in Peru and develop interventions that are better tailored to the needs of this growing group. However, no known work has studied the epidemiological profiles (including sexual and drug-related risk behaviors) among Peruvian MSM social media users to better understand their needs and associated risks. The aim of

this study was to assess the relationship between substance use and sexual risk behaviors among Peruvian MSM social media users.

## Materials and Methods

Participants completed consent online and over the phone to join in the study. The study coordinator assisted participants during the consent process by being available to answer study-related questions on the phone and/or by email, and well as documenting consent after participants consented. Written consent was not obtained as this study was designed to use online recruitment methods to maximize reach and reduce barriers associated with in-person recruitment visits (e.g., reduce participant time spent travelling to the clinic, stigmatization associated with face-to-face involvement in an HIV-related study, etc). Institutional review boards (IRBs) at Epicentro (Lima, Peru) and the University of California, Los Angeles, reviewed and approved the study protocol, including the consent procedure.

### Study Population and Participants

A total of 556 MSM ages 18–59 who use social media (Facebook) were recruited online. We recruited participants who: 1) were male, 2) reported having had sex with a man in the past 12 months, 3) were 18 years of age or older, 4) reported living in the Lima Metropolitan area, and 5) had a social media account.

### Recruitment, Informed Consent and Enrollment

From January to June 2012, participants were recruited via the internet (e.g., website banner advertisements, email, Facebook) to complete an online anonymous survey. We used banner ads to recruit participants on three of the major Peruvian gay websites: gayperu.com, peruesgay.com and perugay.com, as well as Facebook. Banner ads redirected participants to a form, in which they provided an email address and a phone number. Next, a study staff member contacted the potential participant to explain the study objectives, procedures, and consent process. Interested participants were sent an email with a link to an online informed consent form where they were asked to read and complete to confirm their study participation. Next, participants were required to connect to a Facebook “fan page” created for the study before receiving the baseline survey. The creation of a fan page allowed us to increase data quality: All participant profiles were checked as an attempt to ensure they were unique Facebook profiles, for example, by checking for no duplications in names and checking the number of friends in an attempt to see whether they had created a fake profile for study participation. These methods have been recommended in previous research guidelines on using social media for HIV prevention (Sean D Young, 2012). Participants received a baseline survey deployed via an online survey website. Gift cards valued at US \$10 for a local supermarket were provided after completion of the baseline survey.

### Measurements

We collected information on demographics, including area of origin, sex (male or transgender woman), sexual orientation, age, race, current marital/partnership status, current work situation, and income from last month. To assess sexual risk, we adapted items from the SATHCAP HIV study (Shoptaw et al., 2009). Participants were asked if they had had

casual sexual partners, sex with unknown persons, unprotected sex (vaginal, unprotected receptive anal, and unprotected insertive anal sex), and oral sex in the past three months. In addition, participants were asked about their frequency of using alcohol or drugs while having sex (response choices included never, less than half of the time during sex, about half of the time, at almost every sexual encounter, and all the time). Lastly, participants reported their use of alcohol (number of days a week, on average, that they had more than 5 alcoholic drinks), and use of drugs within the past 3 months. The following drugs were included in the study: marijuana, methamphetamines, crack, powder cocaine, heroin, ecstasy, poppers, inhalation drugs, sedatives, opiates, club drugs, and hallucinogens.

### Statistical Analysis

We performed a logistic regression of various sexual risk behaviors on alcohol consumption and drug use adjusting for age, education, income, and race. Alcohol consumption was defined as having more than 5 whole (i.e., an 8-ounce glass of wine, a 12-ounce glass of beer, or a 1-ounce shot) alcoholic drinks. Sexual risk behaviors (binary) included insertive unprotected anal sex, receptive unprotected anal sex, casual sex, oral sex, sex with unknown persons, and sex while being buzzed on alcohol. Crude and adjusted odds ratios were used to estimate the association between substance abuse and sexual risk behaviors among MSM. Analyses were conducted using SAS software version 9.3 (SAS Institute Inc. Cary, NC) and the PROC LOGISTIC procedure.

## Results

### Demographics (Table 1)

Most participants originated from South America (99%) and all resided in Lima, Peru. Participants were relatively young, with a median age of 27 (IQR: 23–33). 99% identified as male, 77% described their sexual orientation as Gay, and 20% described themselves as bisexual. About 37% of the participants went to an institute or specialized school and 27% had some college education. About 58% had a full time job and 38% had an income lower than \$286 US. Eighty percent of the sample were never married.

### Substance Abuse (Table 2)

The prevalence of drug use and marijuana use in the past three months was respectively 16% and 10%. Half of the sample reported drinking more than five whole alcoholic drinks a day at least once a week.

### Sexual Risk Behaviors (Table 3)

Over 60% percent of participants reported having had casual sex in the past three months, while 57% reported having had sex with unknown persons. The prevalence of unprotected sex (anal and vaginal) was approximately 50%. Ninety percent had oral sex in the past three months. Thirty six percent reported having had unprotected insertive anal sex and 36% also reported having had unprotected receptive anal sex. Over 20% reported having had sex while buzzed on alcohol and 7% reported having had sex while high on drugs. About 13% of the sample had been told by a care provider that they were HIV positive.

### Sexual Risk Behaviors and Substance Abuse (Table 4)

Drinking more than five whole alcoholic drink a day was associated with an increased odds of having receptive unprotected anal sex, casual sex, sex with unknown persons, unprotected sex, and having sex while buzzed on alcohol in both the crude and adjusted models, while alcohol use was associated with insertive unprotected anal sex and oral sex in the crude model online. Using drugs in the past three months was not associated with an increased likelihood of sexual risk behaviors.

### Discussion

To the best of our knowledge, this is the first study to assess the association between drug and alcohol use (substance use) and sexual risk behaviors among Peruvian MSM social media users. Similar to the high rates of alcohol use among MSM found in other studies, half of the participants in the sample reported averaging more than 5 drinks a day at least once a week (Ludford et al., 2013). We found that drinking more than five whole alcoholic drinks in a day was associated with 52%, 75%, and 82% increased odds for unprotected sex, casual sex, and sex with unknown persons, respectively. Therefore, similar to other studies in Peru and the United States, we found that excessive alcohol intake was associated with heightened risk of HIV (Celentano et al., 2006; Colfax et al., 2004; Ludford et al., 2013). However, unlike a study outside of Peru (Fisher et al., 2007), we did not find associations between alcohol use and being HIV positive among this Peruvian sample. In the United States, drug use has been found to be associated with unprotected insertive or receptive anal intercourse, being HIV positive, engaging in sex work, sex with multiple partners, and sex with people with unknown status (Celentano et al., 2006; Chesney et al., 1998; Ludford et al., 2013; Stueve et al., 2002). Among this Peruvian sample, we did not observe associations between drug use and sexual risk behaviors.

There are a few limitations to the study. This study is cross-sectional, limiting the ability to determine causality. Second, the proportion of participants using different types of drugs was low (<5%), with the exception of marijuana use (approximately 10%). To overcome this problem, we combined all drug use into one dichotomized measure (general drug use in the past three months), making us unable to distinguish effects of different drugs on sexual risk behaviors, such as injection drugs, sex-enhancing drugs and inhalants. These factors might account for the null findings between drug use and sexual risk behaviors. Finally, the study did not assess the frequency or the quantity of drug use that might reveal a dose-response relationship with sexual risk behaviors (Colfax et al., 2005).

In order to successfully and effectively tailor HIV interventions for substance users, research is needed to further understand the social and psychological context and predictors of substance use. For example, personality traits, such as sensation seeking, have been found to influence the link between substance use and sexual risk behaviors (Kalichman, Heckman, & Kelly, 1996; Newcomb, Clerkin, & Mustanski, 2011). Moreover, in some studies, MSM have described substance use as a coping mechanism for dealing with institutional and individual-level HIV and gay-related discrimination (Celentano et al., 2006). For example, studies have shown heterosexual-identified men often live a double life between their girlfriends/wives and casual sexual encounters with other men (Caceres, 2002), and might

seek substance to achieve dis-inhibition or sexual pleasure (Celentano et al., 2006; Gálvez-Buccollini et al., 2009). Given the dire consequences of substance use, it is vital for future HIV programs targeting Peruvian MSM to take these individual and social factors into consideration when addressing the intertwining epidemics of substance use and HIV.

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**Table 1**

Socio-demographic characteristics among a sample of Peruvian MSM social media users, Greater Lima, Peru (n=556)

	<b>Total</b>	
	<b>n</b>	<b>%</b>
<b>Area of origin</b>		
Latin America	551	99.10
Europe	4	0.72
Asia	1	0.18
<b>Age</b>		
18–29	339	61.52
30–39	150	27.22
40–49	54	9.80
50–59	8	1.45
<b>Gender</b>		
Male	552	99.28
Trans woman	4	0.72
<b>Sexual orientation</b>		
Gay	424	77.09
Bisexual	106	19.27
Heterosexual	6	1.09
I am asking myself	14	2.55
<b>Race/Ethnicity</b>		
Indigenous	6	1.13
White	104	19.62
Black	12	2.26
Mixed race (mestizo)	370	69.81
Asian	9	1.70
Other	29	5.47
<b>Education completed</b>		
Up to high school	42	7.55
University/Technical non-graduates	251	45.15
University/Technical graduates	263	47.30
<b>Current marital/partnership status</b>		
Single (never married)	443	79.68
Married/Domestic partnership	9	1.62
Living with a partner	44	7.91
Separated	4	0.72
Divorced	2	0.36
Other/dating	54	9.71
<b>Current work situation</b>		
Handicapped	2	0.37

	<b>Total</b>	
	<b>n</b>	<b>%</b>
Unemployed	39	7.18
I take care of my home	9	1.66
Part time job	100	18.42
Full time job	312	57.46
Student	80	14.73
Retired	1	0.18
<i>Income in the last month (US dollars)</i>		
Less than US\$ 286	195	38.09
US\$ 286 – 573	183	35.74
US \$ 573 – 1145	86	16.80
US\$ 1145 – 1908	35	6.84
More than US\$ 1908	13	2.54

**Table 2**

Substance abuse and Alcohol consumption among Peruvian MSM (n=556)

	<b>Total*</b>	
	<b>n</b>	<b>%</b>
<b><i>Drugs (in the past 3 months)</i></b>		
Marijuana	55	9.89
methamphetamines	1	0.18
crack	0	0.00
powder cocaine	18	3.24
Heroin	0	0.00
Ecstasy	6	1.08
Poppers	23	4.14
Inhalation drugs	0	0.00
sedatives	15	2.70
Club drugs	4	0.72
Opiates	4	0.72
Hallucinogen	5	0.90
None	453	81.47
Refuse to answer	8	1.44
<b><i>Drugs (categorized) in the past 3 months</i></b>		
Any drug	87	16.11
No drugs	453	83.89
<b><i>Drink &gt; 5 whole alcoholic drinks the same day</i></b>		
Yes	283	50.99
No	272	49.01

**Table 3**

Sexual behaviors (in the last three months) among Peruvian MSM (n=556)

	<b>Total*</b>	
	<b>n</b>	<b>%</b>
<b><i>Had casual sexual partners</i></b>		
Yes	309	63.32
No	179	36.68
<b><i>Had sex with unknown persons</i></b>		
Yes	280	57.38
No	208	42.62
<b><i>Had unprotected sex (vaginal or anal)</i></b>		
Yes	246	53.02
No	218	46.98
<b><i>Had oral sex</i></b>		
Yes	428	90.30
No	46	9.70
<b><i>Had anal sex</i></b>		
Insertive unprotected		
Yes	170	36.25
No	299	63.75
Receptive unprotected		
Yes	170	36.25
No	299	63.75
<b><i>High or buzzed on alcohol while having sex?</i></b>		
Never	390	70.78
Less than half of times	132	23.96
About half of times	18	3.27
Almost all the time	10	1.81
Always	1	0.18
<b><i>High or using drugs while having sex?</i></b>		
Never	511	92.57
Less than half of times	29	5.25
About half of times	6	1.09
Almost all the time	6	1.09
<b><i>Ever been told by a care provider that you have HIV/AIDS?</i></b>		
Yes	69	12.90
No	466	87.10
<b><i>Exchange Sex for food, money, drugs, or a place?</i></b>		
Yes	45	9.22
No	443	90.78

**Table 4**  
 Association between substance abuse (in the past 3 months), alcohol consumption, and sexual behaviors among Peruvian MSM

	Alcohol (Yes vs. No)				Drugs (Yes vs. No)							
	* cOR	95% CL	P-value	+ aOR	95% CL	P-value	++ cOR	95% CL	aOR	95% CL	P-value	
<i>Oral sex</i>												
Yes	1.88	1.01, 3.50	0.05	1.78	0.91, 3.50	0.09	0.92	0.41, 2.07	0.85	0.69	0.29, 1.64	0.40
No	1.0	--	--	1.0	--	--	1.0	--	--	1.0	--	--
<i>Insertive unprotected anal sex</i>												
Yes	1.49	1.02, 2.19	0.04	1.45	0.96, 2.20	0.07	0.89	0.53, 1.48	0.65	0.92	0.53, 1.60	0.78
No	1.0	--	--	1.0	--	--	1.0	--	--	1.0	--	--
<i>Receptive unprotected anal sex</i>												
Yes	1.26	0.86, 1.83	0.24	1.34	0.88, 2.03	0.17	1.12	0.68, 1.84	0.65	1.16	0.67, 2.00	0.60
No	1.0	--	--	1.0	--	--	1.0	--	--	1.0	--	--
<i>Casual sex</i>												
Yes	1.7	1.18, 2.47	0.02	1.75	1.17, 2.62	0.01	1.45	0.86, 2.44	0.16	1.66	0.94, 2.96	0.08
No	1.0	--	--	1.0	--	--	1.0	--	--	1.0	--	--
<i>Sex with unknown persons</i>												
Yes	1.63	1.13, 2.33	0.02	1.82	1.23, 2.71	<0.01	0.91	0.56, 1.47	0.70	1.01	0.60, 1.71	0.97
No	1.0	--	--	1.0	--	--	1.0	--	--	1.0	--	--
<i>Unprotected sex</i>												
Yes	1.47	1.02, 2.12	0.04	1.52	1.01, 2.28	0.04	1.12	0.70, 1.81	0.66	1.11	0.65, 1.90	0.71
No	1.0	--	--	1.0	--	--	1.0	--	--	1.0	--	--
<i>Having sex while buzzed on alcohol</i>												
Yes	6.07	3.94, 9.40	<.01	5.95	3.77, 9.97	<.01	--	--	--	--	--	--
No	1.0	--	--	1.0	--	--	--	--	--	--	--	--
<i>HIV status</i>												
Positive	0.55	0.32, 0.92	0.02	0.52	0.31, 0.97	0.04	0.67	0.31, 1.45	0.31	0.81	0.36, 1.83	0.61
Negative	1.0	--	--	1.0	--	--	1.0	--	--	1.0	--	--

\* OR: Odds ratio

+ aOR: adjusted OR. They were generated by the simultaneous entry of covariates (race, age, education, income and drugs/alcohol) in a logistic model

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cOR: Crude OR

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