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ORIGINAL PAPER

Correlates of Sexual Violence Among Men Who Have Sex With Men in Tijuana, Mexico

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Abstract Sexual violence among men who have sex with men (MSM) is prevalent in developing countries and is associated with increased HIV/STI risk. Despite high HIV prevalence (20 %) among MSM in Tijuana, Mexico, little attention has been paid to the occurrence of sexual violence in this high-risk group. The present study used a syndemic conditions framework to examine correlates of sexual violence victimization in a sample of 201 MSM surveyed in Tijuana, Mexico during 2012 and 2013. Participants were recruited through respondent-driven sampling and underwent a 2-h baseline interview and testing for HIV and syphilis. Sexual violence was defined as any incident during the past year in which the participant had been raped, sexually molested, or sexually harassed. The majority of participants self-identified as gay or bisexual, had never married, were employed, and had a high school education or greater. The average age was 29.7 years. Thirty-nine percent reported sexual violence in the past year. A hierarchical multiple linear regression model predicting more experiences of sexual violence was tested. In a final model, a higher number of experiences of sexual violence was associated with a history of childhood sexual abuse, more adult experiences of homophobia, more depression and hostility symptoms, and not living with a spouse or steady partner. The findings from this study support a model of co-occurring psychosocial factors that increase the likelihood of sexual violence experiences among MSM. Multilevel approaches to the prevention of childhood and adult experiences of sexual violence and homophobia are needed to avert the development of adverse mental and physical health outcomes associated with sexual violence victimization.

Keywords Men who have sex with men · Sexual violence · Childhood sexual abuse · Homophobia · Mexico · Sexual orientation

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Introduction

Sexual violence against men who have sex with men (MSM) is pervasive in developed countries and in lower- to middle-income countries (LMIC). Although no consensus exists on how to define sexual violence, the Centers for Disease Control and Prevention defines it as any of a number of different offenses, ranging from forced penetration (completed or attempted), unwanted sexual contact (e.g., touching), and unwanted sexual experiences not involving physical contact (e.g., verbal harassment) (Basile, Smith, Breiding, Black, & Mahendra, 2014, pp. 11–12). In the United States, studies have reported that anywhere from 11.8 to 54 % of gay and bisexual men report a lifetime history of sexual violence (Peterson, Voller, Polusny, & Murdoch, 2011; Rothman, Exner, & Baughman, 2011). Studies of MSM in LMIC have yielded similar lifetime estimates, ranging from 9.5 to 30 % (Aho et al., 2014; Anderson, Ross, Nyoni, & McCurdy, 2015; Dunkle, Jewkes, Murdock, Sikweyiya, & Morrell, 2013a; Guadamuz et al., 2011; Sabido et al., 2015; Sekoni, Ayoola, & Somefun, 2015).

Recent experiences of sexual violence are also prevalent among MSM. Studies conducted in El Salvador and India have documented sexual violence prevalences of 6.5, 18.0, and 40.5 %

in the past year (Newman, Chakrapani, Cook, Shunmugam, & Kakinami, 2008; Shaw et al., 2012; Wheeler, Anfinson, Valvert, & Lungo, 2014). In a study conducted in two different Mexican states (Jalisco and Mexico), approximately 50 % of MSM and 60 % of transgender women (TW) reported ever experiencing sexual violence (Betron, 2009). By comparison, a study of post-traumatic stress disorder (PTSD) in a nationally representative Mexican community sample ($n = 2362$) found that 10 % of the population reported ever experiencing sexual violence (Borges, Benjet, Petukhova, & Medina-Mora, 2014).

To date, little attention has been paid to the role of sexual violence as a contributing factor to HIV infection among MSM in Mexico. Estimates of the prevalence of HIV among MSM in LMIC are high, ranging from 15.8 to 50 % (Hladik et al., 2012; Muraguri, Temmerman, & Geibel, 2012). As in other LMIC, in Mexico MSM have been disproportionately affected by HIV/AIDS (Magis-Rodriguez, Bravo-García, Gayet Serrano, Rivera-Reyes, & De Luca, 2008). The prevalence of HIV among MSM in Mexico has been estimated at 16.9 % (Bautista-Arredondo, Colchero, Romero, Conde-Glez, & Sosa-Rubi, 2013). In Tijuana, which abuts the US border, a recent study among MSM reported a weighted HIV prevalence of 20 % (Pitpitan et al., 2015a). Globally, sexual violence against MSM is linked to increased risk for HIV infection (Pantalone, Horvath, Hart, Valentine, & Kaysen, 2015; Paul, Catania, Pollack, & Stall, 2001; Strathdee et al., 1998).

This study employed a theoretical framework of syndemic conditions (Singer & Snipes, 1992; Stall et al., 2003). The framework suggests that psychosocial and health problems tend to co-occur in vulnerable and disadvantaged populations, including MSM (Herrick et al., 2013). Previous research has identified a variety of problems associated with sexual violence perpetrated against MSM. These include various forms of child maltreatment; adult psychosocial factors such as homophobia and depression; substance use; sexual risk behaviors; and personal and social characteristics such as age and education (Anderson et al., 2015; Dragowski, Halkitis, Grossman, & D'Augelli, 2011; Hequembourg, Parks, Collins, & Hughes, 2015; Rusow, Fletcher, Le, & Reback, 2014; Shaw et al., 2012). We hypothesized that these factors represent syndemic conditions for sexual violence among MSM in an LMIC.

Child maltreatment figures prominently in the sexual violence literature. MSM report higher rates of childhood sexual and physical abuse compared to men in the general population (Lenderking et al., 1997; Lloyd & Operario, 2012; Pantalone et al., 2015; Paul et al., 2001; Rothman et al., 2011). MSM who report childhood sexual abuse are more likely to report adult experiences of sexual violence compared to MSM who do not report childhood sexual abuse (Pantalone et al., 2015).

A number of adulthood psychosocial factors have been linked to sexual violence among MSM. They include experiences of homophobia, psychological distress, and sexual compulsivity. Adult experiences of homophobia and of discrimination are common among MSM and have been associated with sexual violence in several studies (Anderson et al., 2015; Finneran, Chard, Sineath, Sullivan, & Stephenson, 2012; Sabido et al., 2015). In one study, participants' perceptions that they were being discriminated against due to their sexual orientation had the strongest association with ever having experienced sexual violence (Sabido et al., 2015). Sexual violence also has a strong association with psychological distress. In particular, sexual violence experienced by MSM has been positively associated with depressive and PTSD symptoms (Anderson et al., 2015; Choudhary, Coben, & Bossarte, 2010; Heidt, Marx, & Gold, 2005; Rusow et al., 2014). Rusow et al. also found an association among MSM between a history of sexual violence victimization and hostility symptoms. Other studies have found an association between sexual compulsivity and lifetime history of sexual violence victimization, including childhood sexual abuse and intimate partner violence (Herrick et al., 2013; Parsons, Grov, & Golub, 2012; Parsons et al., 2008).

Experiences of sexual violence have also been found to have a strong relationship with sexual risk behaviors. Among MSM, ever having experienced sexual violence has been associated with having multiple sex partners and more unprotected anal sex, with buying sex, and with having sex while under the influence of drugs and alcohol (Guadamuz et al., 2011; Senn, Carey, & Vanable, 2008; Shaw et al., 2012; Strathdee et al., 1998).

The association between sexual violence and substance use has also been well documented (Draucker & Mazurczyk, 2013). Studies have shown increased risk for illicit drug use among MSM who report having ever experienced sexual violence (mainly perpetrated by a stranger or intimate partner) (Rusow et al., 2014; Semple, Strathdee, Zians, McQuaid, & Patterson, 2011). Other studies of MSM have reported an association between a history of sexual violence victimization and increased rates of alcohol use and problem drinking (Hequembourg et al., 2015; Rusow et al., 2014; Sabido et al., 2015; Sekoni et al., 2015).

Finally, personal and social factors that have been associated with sexual as well as physical violence include HIV-positive serostatus (Anderson et al., 2015; Phillips et al., 2014), sex worker identity (Senn et al., 2008; Wheeler et al., 2014), younger age (Lampinen et al., 2008; Rusow et al., 2014; Sekoni et al., 2015; Shaw et al., 2012; Strathdee et al., 1998), gay, bisexual, MSM or transgender identification (Anderson et al., 2015; Guadamuz et al., 2011; Sabido et al., 2015), having an intimate partner (Schraiber, D'Oliveira, França-Junior, & Grupo de Estudos em População Sexualidade e Aids, 2008; Welles, Corbin, Rich, Reed, & Raj, 2011), lower educational attainment (Sekoni et al., 2015), and housing instability, which is an indicator of financial hardship (Rusow et al., 2014).

This study builds upon the extant literature by examining correlates of sexual violence against MSM in Tijuana, Mexico. Consistent with our syndemic conditions framework, we hypothesized that recent experiences of sexual violence (in the past 12 months) among MSM would be associated with a number of

co-occurring conditions, including childhood maltreatment factors, adult experiences of psychosocial problems, drug and alcohol use, sexual risk behaviors, and personal and social impoverishment. As has been done in earlier studies that showed a strong association between adult psychosocial factors and sexual violence victimization, we hypothesized that adult psychosocial factors would predict greater experiences of sexual violence than would childhood maltreatment factors and personal and social characteristics. Understanding the correlates of sexual violence against MSM has the potential to inform the development of HIV prevention programs and treatment services for this high-risk population in Mexico and other LMIC.

Method

Participants

Analyses used baseline data gathered from a sample of 201 MSM in Tijuana, Mexico who were recruited for a study of HIV prevalence and related risk factors. Data were gathered between August 2012 and May 2013. Participants were biologically male, over the age of 18, residents of Tijuana, and reported having had anal or oral sex with a male partner in the past year. Transgender individuals were not included in the sample.

Respondent-driven sampling (RDS) was used to recruit the participants. RDS is a chain-referral recruitment approach that been widely used in HIV research (Heckathorn, 1997, 2011; Magnani, Sabin, Saidel, & Heckathorn, 2005). Respondents are asked to report the size of their social network, after which they are trained to recruit their peers using coded coupons that enable the researchers to keep track of who recruited whom. RDS uses a dual incentive structure according to which participants receive compensation both for completing their own study procedures and for referring peers who enroll in the study. Six seeds were selected to initiate recruitment. All seeds identified as MSM and were diverse with respect to age, ethnicity, socioeconomic status, and self-identified sexual orientation. Four more seeds were added later to bolster recruitment (Pitpitan et al., 2015a).

Participants were paid $20 for a 2-h face-to-face interview (range 1–3 h) conducted by bilingual male interviewers at the offices of the Agencia Familiar Binacional, a community-based AIDS service organization located in central Tijuana. Topics included sociodemographics; drug and alcohol use; mood; sexual risk behavior; STI history; HIV/STI knowledge; experiences of stigma, homophobia, and discrimination as MSM; and childhood experiences of maltreatment. Participants also underwent rapid testing for HIV and syphilis, with pre- and post-test counseling and point-of-care treatment for syphilis. A positive HIV test was confirmed through a blood sample that was assayed at the San Diego County Public Health Laboratories. Finally, each participant, including seeds, received three coupons to recruit other MSM, and each successful referral earned $5 US for the referring participant. The research protocol was reviewed and approved by the UCSD Human Research Protections Program and the Ethics Committee of Universidad Autónoma de Baja California.

Measures

Sexual Violence

Our measure of sexual violence was developed by Ortiz-Hernandez & Granados-Cosme (2006) for a study of violence against bisexuals, gays, and lesbians in Mexico City. Participants were asked the following three questions pertaining to sexual violence victimization: In the past year, how often were you (a) raped, (b) sexually molested, and (c) the victim of sexual harassment? Interviewers provided examples and were trained to clarify differences between each type of violence: sexual molestation (e.g., fondling, touching, stimulation of genitals), rape (i.e., nonconsensual, forced penetration), and sexual harassment (e.g., suggestive comments or gestures, direct sexual propositioning). Scale items were scored 1 = never, 2 = once in a while, 3 = sometimes, and 4 = most of the time. To enhance interpretability of the summary variable, items were recoded (1 = 0), (2 = 1), (3 = 2), (4 = 3). A summary variable was calculated with scores ranging from 0 to 9. A follow-up question to each type of sexual violence queried the relationship(s) to the respondent of the perpetrator(s). Sexual violence in the past 12 months committed by any perpetrator against the respondent was defined as our dependent variable (DV). Because the distribution of the DV was positively skewed, a log-10 transformed version of the sexual violence variable was used in the analyses.

Personal and Social Characteristics

These included age, education, marital status, sexual orientation, employment status, income, living situation, HIV serostatus, and self-identification as a sex worker. The latter was determined by an affirmative response to the following question: “Do you consider yourself to be a sex worker?”

Alcohol Use

Alcohol use during the last year was measured by the Alcohol Use Disorders Test (AUDIT-10) (Conigrave, Hall, & Saunders, 1995; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993). The AUDIT-10 is made up of ten items that measure frequency and quantity of alcohol consumption, binge drinking, dependence symptoms, and harmful effects of alcohol use in the past year (Saunders et al., 1993). The measure has been validated in Mexico (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001; Villamil Salcedo, Valencia Collazos, Medina-Mora Icaza, & Juarez Garcia, 2009).

Drug Use

Participants were presented with a list of 13 drugs including marijuana, cocaine, heroin, and methamphetamine, and they were asked how often they had used each drug in the past month. A summary variable was calculated to represent the total number of drugs used in the past month.

Experiences of Childhood Maltreatment

Childhood sexual abuse was determined by two items: (1) Have you ever been forced or coerced to have sex against your will? (2) The first time this happened to you, how old were you? Participants who reported forced or coerced sex before the age of 18 were coded 1; all others were coded 0. A similar variable was calculated for physical abuse (i.e., hit or assaulted) experienced before the age of 18. Childhood experiences of homophobia (i.e., being discriminated against on the basis of sexual orientation or gender non-conformity) were measured by five items, and a mean score was computed ($\alpha = 0.81$) (Diaz, Ayala, Bein, Henne, & Marin, 2001).

Adulthood Psychosocial Factors

The *Sexual Violence Trauma Index* is a 7-item subscale of the Trauma Symptom Checklist (TSC-40) (Briere, 1996; Briere & Runtz, 1989). Scale items assess how often the participant experienced each of the following PTSD symptoms in the past 2 months: sexual problems, flashbacks, nightmares, fear of men, memory problems, bad thoughts or feelings during sex, and feeling that things are "unreal." Items were rated on a scale ranging from 0 (never) to 3 (often) ($\alpha = 0.75$). *Depressed mood* was measured using the 21-item Beck Depression Inventory (BDI), which has undergone extensive reliability and validation testing ($\alpha = 0.81$) (Beck, 1967, 1976). *Hostility symptoms* were measured using a subscale of the Brief Symptom Inventory (BSI) (Derogatis & Melisaratos, 1983). Participants were asked five questions to assess hostility symptoms (e.g., temper outbursts) during the past week ($\alpha = 0.75$). *Sexual compulsivity* was measured using a 10-item scale that assesses "obsessive preoccupations with sexual acts and encounters" ($\alpha = 0.92$) (Kalichman & Rompa, 1995). The six-item *Experiences of Homophobia Scale* was used to measure the frequency of adult experiences of being discriminated against on the basis of sexual orientation or gender non-conformity ($\alpha = 0.71$) (Diaz et al., 2001). Summary scores were computed for adult experiences of homophobia, Beck Depression, and PTSD symptoms. Mean scores were computed for sexual compulsivity and hostility symptoms.

Sexual Risk Behavior

Six indicators of sexual risk behavior engaged in during the past 2 months were examined in relation to sexual violence. They included the total number of sex partners, total number of anal sex acts, and total number of unprotected anal sex acts; whether the participant had one or more regular partners or casual partners (or one night stands); and whether the participant had one or more anonymous partners with whom money, drugs, or other materials goods were not exchanged.

Statistical Analyses

We were first interested in comparing MSM who reported experiences of sexual violence in the past year ($N = 76$) with those who did not ($N = 119$). Six cases were missing sexual violence data. *T* tests and contingency-table analysis were used to examine group differences in continuous and categorical variables, respectively. Five variables with positively skewed distributions, including the dependent variable (sexual violence victimization in the past year, total number of anal sex acts and total number of unprotected anal sex acts in the past 2 months, total number of sex partners in past 2 months, number of drugs used in past month) were log-10 transformed. After identifying correlates of any recent sexual violence, we tested a hierarchical multiple linear regression model predicting greater sexual violence victimization (continuous variable). Variables that were significant at the 5 % level were included in this model. The variables were entered in steps that were ordered with regard to their temporality and logically determined priority, as assessed by the researchers. Unweighted data were used in the multivariate analyses (Gelman, 2007). In a previous article (Pitpitan et al., 2015a), we reported no effect of sampling method (i.e., clustering) on these data. Homophily and clustering by respondent, recruitment chain, geographic area, and common-recruiter cluster levels were evaluated using one-way ANOVA. No significant clustering was identified. The results of this testing procedure (Spiller, 2009) support the use of unweighted data in the present analyses.

Sexual violence was regressed on three blocks of variables: personal and social characteristics and alcohol use (Step 1), childhood experiences of maltreatment (Step 2), and adult psychosocial factors (Step 3). Drug use and sexual risk variables were excluded from the multiple regression based on univariate results.

Results

Sample Characteristics

The majority of participants self-identified as either gay (63.5 %) or bisexual (33.0 %) and had never been married (82.1 %). The average age was 29.7 (SD = 8.7, median = 28, range 18–65), and 48.7 % had a high school education or greater. Most participants were employed (60.3 %); 54.5 % reported an average monthly income of >3500 pesos. Eighteen percent of respondents lived with a male spouse or steady partner. Twenty-four percent reported sex with a woman in the past 2 months. The

majority lived alone or with another person who was not a sex partner (33.7 and 39.2 %, respectively). Fifteen percent self-identified as sex workers. Eighteen percent ($N = 35$) tested HIV-positive at baseline, and 8.0 % ($N = 16$) tested syphilis positive.

Reported Frequency and Sources of Sexual Violence

Thirty-nine percent of the sample ($N = 76$, out of 195 cases with data) reported sexual violence victimization in the past 12 months, which included (in rank order): sexual molestation (11.9 %), sexual harassment (11.9 %), and forced or coerced sex (1.5 %). The most frequently named perpetrator of adult sexual violence was "a stranger." Childhood sexual abuse (forced or coerced sex) before the age of 18 was reported by 21.0 % ($N = 41$) of the sample. The most frequently named perpetrator of childhood sexual abuse was a male relative, most often a cousin or uncle.

Univariate Analysis

Only one personal or social characteristic was significantly associated with sexual violence (Table 1). Specifically, participants who reported the experience of sexual violence in the past 12 months were less likely to be living with a male spouse or steady partner. With regard to child maltreatment factors (age < 18 years), MSM who experienced recent sexual violence reported higher scores on childhood experiences of homophobia and were significantly more likely to report childhood experiences of both sexual and physical abuse compared to their counterparts who reported no childhood abuse. With regard to adult psychosocial factors, participants who reported a recent experience of sexual violence had significantly higher scores on sexual compulsivity, adult experiences of homophobia, depressive symptoms, hostility, and PTSD symptoms. Alcohol use was also significant: MSM who reported experiences of sexual violence in the past 12 months had significantly higher scores on the AUDIT-10. No group differences in drug use or sexual risk behaviors were observed.

Hierarchical Linear Regression

In Step 1, personal and social characteristics and alcohol use accounted for a significant portion (3.9 %) of the variance in the DV ($R^2\ \Delta = 0.039$, $F = 3.68$, $df = 2, 179$). Living with a spouse or steady partner was marginally significant ($p = 0.06$) and associated with fewer experiences of sexual violence. In Step 2, childhood maltreatment factors contributed an additional 22.0 % of variance ($R^2\ \Delta = 0.220$, $F = 12.32$, $df = 5, 176$). MSM who reported childhood sexual abuse (forced or coerced sex <18 years) had more experiences of sexual violence in the past 12 months. Higher scores on a measure of childhood experiences of homophobia were also associated with more sexual violence in the past year. In the third and final step of the regression, psychosocial factors accounted for an additional 9.7 % of the variance in sexual violence in the past year ($R^2\ \Delta = 0.097$, $F = 9.48$, $df = 10, 171$). MSM who scored higher on a measure of adulthood experiences of homophobia reported more sexual violence in the past year. Further, sexual violence experiences in the past year were associated with higher scores on hostility and depressive symptoms. Childhood sexual abuse and living arrangement remained significant at this step, while childhood experiences of homophobia were no longer significant. Thus, in the final model, more experiences of sexual violence in the past 12 months were independently associated with not living with a spouse or steady partner, having a history of childhood sexual abuse, more adult experiences of homophobia, and higher scores on depression and hostility symptoms (see Table 2). Since previous research has shown differences between MSM and men who have sex with men and women (MSMW) in terms of sexual violence and other psychosocial factors (Davis et al., 2015; Dyer, Regan, Pacek, Acheampong, & Khan, 2015; Wang et al., 2015), we re-ran the hierarchical regression model excluding 48 participants who reported sex with women in the past 2 months. The substantive findings were mostly unchanged. Forced sex before age 18, Beck depression, and adult experiences of homophobia remained significant, while hostility symptoms and living arrangement yielded marginal significance ($p < .10$). Post-traumatic stress symptoms, which had previously been only marginally significant ($p < .10$), yielded significance at $p < .05$.

Discussion

In this study of MSM in Tijuana, Mexico, 39 % of participants reported sexual violence victimization in the past 12 months. Although varying definitions of sexual violence make it difficult to make direct comparisons, this prevalence of sexual violence in the past year is similar to at least one study of MSM in India (Newman et al., 2008). These findings point to the dangerous and oppressive situation that exists for MSM in Mexico and other LMIC where same-sex relationships remain socially and culturally unacceptable (Steffens, Jonas, & Denger, 2015; Verduzco, 2014). Several factors that were hypothesized to have an association with sexual violence emerged as significant, including history of childhood sexual abuse, adult experiences of homophobia, depression, hostility symptoms, and living arrangement. The frequent occurrence of sexual violence among MSM in Tijuana should be considered an urgent public health issue given the relationship between sexual violence and adverse mental and physical health outcomes, including increased vulnerability to HIV/STI infection (Anderson et al., 2015; Choudhary et al., 2010; Heidt et al., 2005; Hladik et al., 2012; Kalichman, Gore-Felton, Benotsch, Cage, & Rompa, 2004; Rusow et al., 2014).

Childhood sexual abuse had the strongest association with more experiences of sexual violence in the past year. This finding is consistent with reports from other studies that 24 to 44 % of gay and bisexual men who experienced childhood sexual abuse were sexually victimized in adulthood as well (Heidt et al., 2005;

Table 1 Baseline characteristics associated with sexual violence in the past year among men who have sex with men in Tijuana, Mexico ($N = 201$)

	Experienced sexual violence ($N = 76$)[a,b]	Did not experience sexual violence ($N = 119$)[a,b]	t value or χ^2	Total ($N = 201$)[c,d]
Personal and social characteristics				
Age (per year)	28.6 (8.0)	30.5 (9.2)	1.44	29.7 (8.7) (0.62)
Sexual orientation				
Gay	53 (69.7 %)	74 (62.7 %)	1.51	127 (65.5 %)
Bisexual	23 (30.3 %)	43 (36.4 %)		66 (34.0 %)
Heterosexual	0 (0.0 %)	1 (0.8 %)		1 (0.5 %)
Living arrangement (lives with male spouse or steady vs. other)*	9 (11.8 %)	26 (22.2 %)	3.34	35 (18.1 %)
Education (high school or more vs. less than high school)	38 (50.0 %)	57 (47.9 %)	0.08	95 (48.7 %)
Employment (employed vs. not employed)	47 (61.8 %)	70 (59.3 %)	0.12	117 (60.3 %)
Marital status (never married vs. other)	61 (82.4 %)	95 (81.9 %)	0.01	156 (82.1 %)
Average monthly income (>3500 pesos vs. ≤3500 pesos)	37 (50.7 %)	65 (57.0 %)	0.72	102 (54.5 %)
HIV serostatus (HIV+ vs. HIV− or unknown)	12 (15.8 %)	23 (19.3 %)	0.39	35 (17.9 %)
Self-identifies as a sex worker	13 (18.1 %)	14 (12.3 %)	1.19	27 (14.5 %)
Childhood maltreatment factors				
Forced or coerced into sex <18 years (y/n)***	28 (36.8 %)	13 (10.9 %)	18.8	41 (21.0 %)
Physical abuse <18 years (y/n)**	11 (14.5 %)	5 (4.2 %)	6.50	16 (8.2 %)
Childhood experiences of homophobia***	7.91 (4.13)	4.99 (4.13)	4.81	6.13 (4.36) (0.31)
Adult psychosocial factors				
Sexual compulsivity*	1.87 (0.62)	1.68 (0.61)	2.00	1.74 (0.62) (0.04)
Adult experiences of homophobia***	4.6 (3.44)	2.0 (2.34)	5.75	3.03 (3.08) (0.22)
Depressive symptoms***	13.5 (8.7)	8.6 (6.59)	4.16	10.6 (7.83) (0.55)
BSI hostility***	1.86 (0.72)	1.52 (0.68)	3.26	1.64 (0.71) (0.50)
PTSD symptoms***	4.11 (3.45)	1.94 (2.36)	4.71	2.81 (3.04) (0.22)
Sexual risk behavior				
Number of other regular partners in past 2 months	1.21 (1.3)	1.57 (2.84)	0.87	1.41 (2.37) (0.19)
Number of casual sex partners in past 2 months	4.13 (8.15)	2.07 (3.57)	1.79	2.98 (5.79) (0.46)
Number of anonymous partners in past 2 months (no money exchanged)	2.28 (6.41)	1.43(5.06)	0.89	1.69 (5.48) (0.44)
Number of exchange for sex partners in past 2 months	2.40 (6.75)	2.27 (8.34)	0.09	2.37 (7.99) (0.64)
Total number of sex partners in past 2 months	7.7 (14.9)	6.54 (13.0)	0.57	7.15 (13.7) (0.98)
Total number of anal sex acts with male partners in past 2 months	22.4 (25.3)	16.8 (20.4)	1.52	18.8 (22.4) (1.70)
Total number of unprotected anal sex acts with male partners in the past 2 months	7.55 (14.5)	5.38 (13.6)	0.98	6.35 (13.9) (1.06)
Total number of vaginal sex acts with female partners in past 2 months ($n = 45$)	9.3 (8.2)	17.8 (27.1)	1.46	14.8 (21.3) (3.18)
Total number of unprotected vaginal sex acts with female partners in past 2 months ($n = 45$)	5.4 (9.1)	11.4 (26.7)	0.81	9.6 (21.2) (3.16)
Total number of anal sex acts with female partners in past 2 months ($n = 46$)	5.6 (7.7)	10.7 (26.2)	0.91	8.7 (20.6) (3.03)

Table 1 continued

	Experienced sexual violence ($N = 76$)[a,b]	Did not experience sexual violence ($N = 119$)[a,b]	t value or χ^2	Total ($N = 201$)[c,d]
Total number of unprotected anal sex acts with female partners in the past 2 months ($n = 46$)	3.6 (8.0)	7.1 (24.8)	0.65	6.0 (19.5) (2.87)
Substance use				
AUDIT-10*	8.9 (8.8)	6.6 (6.58)	1.97	7.37 (7.55) (0.49)
Number of drugs used (lifetime)	1.63 (1.89)	1.69 (1.99)	0.22	1.70 (2.0) (0.14)
Number of drugs used in past month	0.75 (1.26)	0.79 (1.30)	0.22	0.81 (1.33) (0.09)
Injected drugs in past 2 months	0 (0 %)	4 (3.4 %)	2.61	4 (2.1 %)
Used alcohol before or during sex in the past 2 months	37 (63.8 %)	44 (53.0 %)	1.62	81 (57.4 %)
Used drugs before or during sex in the past 2 months	7 (9.7 %)	16 (14.2 %)	0.80	23 (12.4 %)

* $p < .05$; ** $p < .01$; *** $p < .001$

[a] Values are shown in the form *N* (%) or *Mean* (*SD*)

[b] In past year

[c] Six cases missing sexual violence data

[d] Values are shown in the form *N* (%) or *Mean* (*SD*) (*SE*)

Kalichman et al., 2001; Pantalone et al., 2015). As for many LMIC, current prevalence estimates for childhood sexual abuse in Mexico are lacking; however, our data suggest the need to increase monitoring and prevention in order to reduce the number of children exposed to sexual violence and to increase availability of social services for those who have been victimized (Sumner et al., 2015). The mechanisms that link sexual violence victimization in childhood and in adult life are not well understood; however, it has been proposed that children who experience sexual abuse may suffer from impaired risk perception and emotional dysregulation (Messman-Moore, Walsh, & DiLillo, 2010). Emotional dysregulation refers to heightened emotional sensitivity and negative affect that manifests in maladaptive coping and difficulty controlling emotions (Carpenter & Trull, 2013; Pantalone et al., 2015). This disorder can lead to substance use, depression, and other psychological states that may increase vulnerability to sexual violence in adulthood. HIV/STI prevention interventions for MSM need to address childhood sexual abuse histories and re-victimization. Most important, counseling or therapy sessions should address the trauma of childhood sexual abuse (along with other, co-occurring types of abuse) and its negative health consequences. Psychological treatments that address the adverse consequences of sexual violence include cognitive behavior therapy (CBT), individual and group therapy, recovery groups, hypnosis, and psychoanalysis (Walker, Holman, & Busby, 2009). To date, the availability and accessibility in Tijuana and elsewhere in Mexico of these types of treatment are limited; thus, public health authorities would be well advised to develop or expand treatment programs for sexual violence victimization that are tailored to the needs and experiences of MSM.

More sexual violence victimization in the past year was also associated with psychological distress, including both depression and hostility symptoms. Other studies of sexual violence have documented the negative impact of sexual violence on the mental health of MSM (Anderson et al., 2015; Heidt et al., 2005; Rusow et al., 2014). The high levels of depressive symptoms and hostility associated with sexual violence victimization suggest the need for behavioral therapy and perhaps long-term psychotherapy for those who have suffered childhood sexual abuse (Gillies, Taylor, Gray, O'Brien, & D'Abrew, 2013; Schilling, Weidner, Schellong, Joraschky, & Pohlmann, 2015).

We did not gather data on the behavioral manifestations of hostility symptoms; however, high levels of hostility could be manifested in aggression toward others, physical assaults, and property damage. Anger management groups have proven effective in treating substance abuse and PTSD, and it could likewise be useful for MSM who have experienced sexual violence. Anger management programs would need to address the role of sexual violence victimization as a trigger for hostility symptoms and aggressive behaviors. Individualized understanding of the link between sexual violence and hostile or aggressive behaviors is critical to developing anger-control plans and conflict resolution techniques (Reilly, Clark, Shopshire, Lewis, & Sorensen, 1994). The association between depression and sexual violence is of clinical significance, as it may put MSM at risk for suicidal ideation and destructive or self-injurious behaviors (Cottler, Campbell, Krishna, Cunningham-Williams, & Abdallah, 2005). Accordingly, MSM who report recent experiences of sexual violence to law enforcement or health care professionals should be assessed for clinical levels of depression so that those at risk

Table 2 Sexual violence in the past year regressed on personal and social characteristics and alcohol use (Step 1), child maltreatment variables (Step 2), and psychosocial factors in adulthood (Step 3) among men who have sex with men in Tijuana, Mexico ($N = 182$)

	Step 1		Step 2		Step 3	
	β	sr^2	β	sr^2	β	sr^2
Live with male spouse or steady (y/n)	−.132‡	.017	−.161*	.026	−.146*	.020
Alcohol use (AUDIT-10)	.137	.019	.110	.012	.008	.000
Forced or coerced sex <18 years (y/n)			.328***	.103	.286***	.074
Experienced physical abuse <18 years (y/n)			.124	.015	.053	.003
Childhood experiences of homophobia			.246***	.058	.042	.001
Beck depression					.152*	.016
Post-traumatic stress disorder (PTSD) symptoms					.111	.010
BSI hostility symptoms					.138*	.015
Adult experiences of homophobia					.251**	.035
Sexual compulsivity					.073	.004
Constant	.189		.044		.044	
R^2	.039		.259		.357	
R^2 change	.039*		.220***		.097***	
F (df)	3.68* (2,179)		12.32*** (5,176)		9.48*** (10,171)	

β standardized regression coefficient

‡ $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$ (2-tailed tests)

[a] Nineteen cases missing data

can be identified and treated early. Depressive symptoms have been shown to be highly responsive to CBT, which uses skill-building exercises, counselor feedback, and structured exercises (e.g., relaxation, imagery, symbolism) to promote self-management of negative mood. Although CBT programs are available in government-sponsored programs in Tijuana, few are tailored to the needs of sexually victimized patients. We recommend the expansion and tailoring of existing programs to meet the needs of MSM who have experienced recent sexual violence. Such action on the part of authorities could be highly effective in curtailing the adverse mental health outcomes that often fuel HIV risk in this high-risk population.

This research yielded a strong association between adult experiences of homophobia and more sexual violence victimization in the past year. This association has major implications for HIV/STI prevention. Sexual violence against MSM in the context of homophobia and stigma experiences can serve as a barrier to access by affected MSM to medical treatment and prevention services, thereby increasing their vulnerability to HIV infection (Aho et al., 2014; Huebner, Davis, Nemeroff, & Aiken, 2002). The mechanisms through which experiences of homophobia become a risk factor for sexual violence victimization and re-victimization are not well understood, and should be examined in future research.

Although same-sex marriage was recently legalized in Mexico, homophobia, antigay stigma, and social sanctions against same-sex relationships remain widespread (Verduzco, 2014). We advise the development of nationwide government-based health initiatives and campaigns, to be directed at service providers and the general public, to address homophobia and its negative effects upon the health behaviors of MSM. In particular, experiences of homophobia among young MSM may be a risk factor for initiating the dangerous cycle of sexual risk behavior, sexual violence victimization, and HIV/STI acquisition. HIV prevention messages that raise public awareness of the prevalence and negative consequences of homophobia and sexual violence should target young people in community and educational settings (Rodriguez, Madera, & Diaz, 2013).

Multi-level approaches, which include both individual-level and social-structural interventions, are needed to address the effects of sexual violence victimization and its co-occurring factors. Individual therapies, including CBT, cognitive processing therapy, motivational interviewing, and mindfulness-based stress reduction have been shown to be effective in managing negative emotions (e.g., depressive symptoms, hostility) associated with experiences of HIV stigma, homophobia, and childhood sexual abuse (Gayner et al., 2012; Gillies et al., 2013; Kaysen, Lostutter, & Goines, 2005; Saftlas et al., 2014). Social-structural interventions, including better access to free condoms, increased access to quality care and treatment programs for sexual violence victimization, and human rights campaigns that address institutionalized homophobia and social violence against MSM (Rodriguez et al., 2013) need to be developed and implemented throughout Mexico and other LMIC. We also advocate that health care professionals and law enforcement personnel receive educational and sensitivity training to increase awareness of the problem and to ensure that their actions are neither homophobic nor perceived as such, and that reported cases of sexual violence be handled with

sensitivity, professionalism, and respect. We also call for modification of policing policies that may contribute to the culture of stigma, discrimination, and violence against MSM. Policy changes should include consistent investigation of all sexual violence crimes reported by MSM and addressing barriers to the reporting of sexual violence victimization.

Participants who lived with a male spouse or steady partner experienced significantly less sexual violence in the past year. This finding is contrary to reports by other studies of high levels of sexual violence against MSM perpetrated by their intimate partners. Lifetime prevalence estimates of sexual intimate partner violence (IPV) from studies conducted mostly in the U.S. ranged from 12 to 30 % (Blosnich & Bossarte, 2009; Nieves-Rosa, Carballo-Dieguez, & Dolezal, 2000). In one study that included LMIC, the prevalence of sexual IPV among MSM in South Africa was 3.99 % and in Brazil, 2.71 % (Finneran et al., 2012). Sexual violence perpetrated by intimate partners of MSM in Mexico may be under-reported due to stigma and discrimination against same-sex relationships, which may engender fear of greater humiliation and criticism on the part of those victimized. Moreover, MSM who want to keep their sexual orientation a secret may be more reluctant to report sexual violence by an intimate partner (Finneran et al., 2012).

Contrary to previous studies, we found no association between sexual violence victimization and sexual risk behavior. It is possible that our inclusion of molestation and harassment as well as actual forced or coerced sex in our definition of sexual violence accounts for this discrepancy, or perhaps it is when sexual violence clusters with other risk factors (e.g., depression, substance use) to form a syndemic that its association with HIV-related sexual risk behavior emerges (Mimiaga et al., 2015; O'Leary, Jemmott, Stevens, Rutledge, & Icard, 2014; Safren, Reisner, Herrick, Mimiaga, & Stall, 2010; Santos et al., 2014).

When MSMW were excluded from the regression model, we found a significant association between PTSD symptoms and sexual violence victimization. Although this could be a statistical artifact, it is also possible that characteristics of MSMW were masking the relationship. Future research is needed to replicate this finding. Also, studies in LMIC have identified key differences between MSM and MSMW. It has been shown that MSMW have greater risk of IPV (Davis et al., 2015), higher HIV prevalence, greater likelihood of trading sex, greater use of alcohol and illicit drugs (Wang et al., 2015), lower odds of prior HIV testing (Bowring, Veronese, Doyle, Stoove, & Hellard, 2016), and more inconsistent use of condoms with male partners (Ramakrishnan et al., 2015) compared to MSM only. Accordingly, future studies should examine correlates of sexual violence victimization in separate models for MSM and MSMW.

This study had limitations. Because an RDS sampling procedure was used, these findings cannot be generalized to the larger population of MSM in Tijuana or elsewhere in Mexico, nor to MSM in other LMIC. Moreover, because our study design was cross-sectional, causality and directionality in the relationships between sexual violence and variables of interest cannot be determined. Prospective data are needed to determine directionality of effects and to make attributions of causality. The present findings are also limited by the retrospective and self-report nature of our data. For example, frequency of drug use was lower than expected and may have been under-reported by participants. Because of the low reported frequency of drug use limited our ability to distinguish the potential correlations of specific drugs and their usage frequencies with sexual violence, we defined drug use as "total number of drugs used in the past month." Future studies would do well to examine the usage frequencies of specific drugs or clusters of similar drugs in relation to sexual violence. Also, our definition of sexual violence included molestation and harassment in addition to forced or coerced sex, making it difficult to compare the reported frequency of sexual violence in our sample with other reports for LMIC, most of which restricted their definition of sexual violence to forced or coerced sex. We concur with other researchers who propose that sexual violence occurs on a continuum ranging from, for example, sexual harassment to rape (Kelly, 1987; McMahon & Baker, 2011; Stout, 1991), and that behaviors at both ends should be included in our definitions of sexual violence because they "contribute to a culture of violence that supports and tolerates violence" (McMahon & Baker, 2011, p. 3). Moreover, other, co-occurring forms of violence, including physical, psychological, and verbal, were not examined in this study. Since high rates of these types of violence have been reported among MSM (Anderson et al., 2015; Wheeler et al., 2014), future work in Mexico should examine how they combine or interact with experiences of sexual violence.

The exclusion of transgender individuals from the present study may have underestimated the prevalence of sexual violence and failed to identify correlates that are unique to the transgender population. Although transgender persons, particularly transgender women (TW), carry a high risk for HIV/STI infection and violence victimization (Herbst et al., 2008; Kenagy, 2005; Lombardi, Wilchins, Priesing, & Malouf, 2001), this high-risk population has been underrepresented in HIV/STI research in Mexico and other LMIC (Cuadra-Hernandez, Zarco-Mera, Infante-Xibille, & Caballero-Garcia, 2012; Peitzmeier et al., 2015). Future studies should assess HIV-related risk behaviors, HIV/STI prevalence, and psychosocial factors (e.g., depression, substance use) among transgender persons so that interventions and services can be tailored to their needs and behavioral characteristics.

Finally, this study did not gather data on perpetrators' gender. This is counted as a limitation because recent studies have countered the idea that all perpetrators of sexual violence against men are males (Hequembourg et al., 2015). Several studies conducted in Mexico have identified female perpetrators of childhood sexual abuse against male children and adolescents. They include aunt (Frias & Erviti, 2014), girlfriend (Chavez Ayala et al., 2009), teacher, mother, stepmother, and prostitute (Frias & Erviti, 2014). Most studies of adult sexual assault against MSM, particularly in LMIC, identify male

perpetrators (Aho et al., 2014; Dunkle et al., 2013a, b; Sabido et al., 2015); however, one study of gay and bisexual men in the US reported that bisexual men had more female perpetrators of sexual assault than their gay counterparts (Hequembourg et al., 2015). Taken together, this literature suggests that future studies of childhood and adulthood sexual violence should assess the gender of the perpetrator so that prevention and treatment programs for sexual violence victimization can take into account gender-based characteristics of the perpetrators.

This study points to additional research needs. First, definitions of sexual violence need to be more uniform and also be expanded to capture the complex and multi-faceted nature of this phenomenon. Second, there is a need for the development of theoretical frameworks that specify the underlying mechanisms that link triggers of violence with acts of sexual violence. Third, prospective studies are needed to shed light on experiences of re-victimization, including correlates and causal pathways. Fourth, psychological, physical, social, and economic outcomes associated with sexual violence against MSM should be evaluated in culture-specific contexts. Fifth, given the relatively high proportion of men who self-identified as bisexual, engaged in recent sex with female partners, or both, further research that focuses on the health concerns and needs of MSMW is warranted. Finally, the role of social media and communication technology (e.g., "hook-up" websites) in increasing the risk for sexual violence victimization among MSM in LMIC should be explored (Bowman et al., 2015; Herrick et al., 2013; Macy, 2008; Ward et al., 2012).

Conclusion

In Tijuana, the high reported frequency of sexual violence among MSM demands immediate attention from government and public health officials. These findings also have important implications for Mexico as a developing country. In the absence of swift action to reduce homophobia and sexual violence against MSM, rates of HIV infection in this population could increase. The findings from this study suggest a model of co-occurring psychosocial factors (childhood sexual abuse, adult homophobia experiences, depressive symptoms, hostility) that increase the likelihood of sexual violence experiences among MSM (Pitpitan et al., 2015b). The development of multi-level approaches to address sexual violence and its co-occurring factors in LMIC like Mexico supports a global agenda to eradicate discrimination and human rights violations against vulnerable and marginalized groups such as MSM.

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Compliance with ethical standards

Conflict of Interest None.

Ethical Approval All procedures performed in this study that involved human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Informed consent was obtained from all individual participants.

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