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“Outness” as a moderator of the association between syndemic conditions and HIV risk-taking behavior among men who have sex with men in Tijuana, Mexico

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Abstract

Background—Multiple psychosocial conditions tend to co-occur and contribute to higher risk for HIV among men who have sex with men (MSM), a phenomenon known as syndemics. Less is known about moderating factors that may attenuate the relation between syndemic conditions and sexual risk-taking.

Purpose—We examined disclosure of same-sex sexual behavior or “outness” as a moderating factor of the syndemic effect.

Method—We recruited a sample of MSM (n=191) using respondent-driven sampling in Tijuana, Mexico. Participants completed a survey of syndemic conditions (i.e., substance use, depression, violence, internalized homophobia, and sexual compulsivity), sexual risk-taking (i.e., condom unprotected anal sex with a stranger in the past two months), and the degree to which they are “out” about sex with men.

Results—Consistent with previous research, we found that men who report more syndemic conditions show a greater prevalence of sexual risk-taking. As predicted, men who were out to more people showed a weaker association between syndemic conditions and sexual risk-taking, whereas men who were out to fewer people showed the strongest association.

Conclusions—This study is the first to provide evidence of “outness” as a moderating factor that attenuates syndemic effects on sexual risk-taking. Building upon previous research, the data suggest that “outness” may be a resilience factor for MSM in Tijuana. HIV prevention intervention implications are discussed.

Keywords

MSM; HIV; syndemics; internalized homophobia

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Conflict of Interest Statement

The authors have no conflicts of interest to report.

Introduction

Men who have sex with men (MSM) continue to be disproportionately affected by HIV in both developed and developing countries (1). Whereas individual-level risk behavior (i.e., unprotected anal intercourse) plays a substantial role in contributing to disease burden, factors at other levels, including community-level drivers work to sustain high HIV transmission rates among MSM populations (1). Scientists have theorized that similar to other vulnerable and disadvantaged populations, multiple epidemics of psychosocial and health problems tend to co-occur in MSM communities, a phenomenon known as syndemics (2). Co-occurring health problems interact to increase vulnerability to HIV infection via sexual risk-taking behaviors (3). The evidence suggests a robust dose-response relationship such that HIV prevalence or high risk-taking behavior increases among individuals who report more psychosocial and health problems (or syndemic conditions) (4–6). Research on syndemics and the conditions under which they may or may not relate to HIV risk is important for HIV prevention and intervention development.

Substance use and poor mental health, particularly depression, are two syndemic conditions that tend to co-occur with HIV risk behavior in different populations (3,7). Other syndemic conditions that tend to co-occur depend on the population and context. For example, food insufficiency is important to consider in syndemics in more resource-poor settings (8). In women, sex workers, and MSM, experience with violence also plays a central role in syndemics (9). Violence may be experienced from intimate partners, during childhood, or during adulthood; regardless, individuals who experience abuse are more likely to engage in substance use, report poor mental health, and engage in sexual risk behavior (10–12). Internalized homophobia and sexual compulsivity have also been shown to co-occur with HIV risk and other syndemic conditions among MSM (5,13).

The fact that multiple psychosocial and health conditions tend to co-occur and place MSM at higher risk for HIV infection points to the need for prevention programs to target co-morbid conditions simultaneously, aiming to improve overall quality of life rather than focus solely on individual-level risk behaviors. Another worthwhile research direction for the development of HIV prevention interventions is to examine moderators, or the conditions under which syndemic conditions are more or less likely to put individuals and communities at higher risk for HIV. Whereas most of the research on syndemics and HIV has focused on replicating findings in different MSM populations, data on moderating factors are beginning to emerge. For example, O'Leary and colleagues studied Black MSM in the United States and showed that higher optimism and education attenuated the association between syndemic conditions and HIV (14). Whereas men who report the highest number of syndemic conditions also report the highest likelihood of risky sex, there still remain a substantial proportion of these men who report avoiding sexual risk-taking behaviors. Therefore, despite the fact that some men may experience a multitude of negative problems and life circumstances, many remain resilient (15). Research on factors that may attenuate or buffer the association between syndemic conditions and HIV risk is important not only for the identification of intervention targets in HIV prevention programs, but also for the general promotion of individual and community health and well-being.

Coming and being “out” about one's sexual orientation represents an important developmental stage for gays and lesbians (16,17). Whereas concealment of one's sexual identity puts one at an elevated risk of physical health problems (18), being “out” is associated with positive outcomes. This includes greater self-acceptance and connection to potential positive social supports in the gay community (19,20), each of which represent valuable resilience factors and strategies that may counteract the negative effect of syndemics (15).

In the current study we examine syndemics and “outness” as a potential moderating factor among MSM in Tijuana, Mexico. Tijuana is located on the northwestern border of Mexico and abuts San Diego, California, forming the busiest border crossing in the world (21). Tijuana has an HIV prevalence double the national average, and is experiencing a burgeoning HIV epidemic.(22,23) A recent study to estimate prevalence among MSM in Tijuana revealed that approximately 1 in 5 MSM are infected with HIV, the highest HIV prevalence compared to any other subgroup (e.g., female sex workers and injection drug users). Of those who tested positive, 89% were unaware of their infection (24). Using this sample of MSM in Tijuana, we examine drug use, depression, history of abuse, internalized homophobia, and sexual compulsivity and hypothesize that these conditions co-occur, and that individuals who report more of these conditions also report a greater likelihood of engaging in sexual risk-taking (i.e., condom unprotected anal sex with a stranger). We also hypothesize that “outness” attenuates this association. Specifically, we predict that the relation between syndemic conditions and sexual risk-taking is less strong among men who are “out” to more people.

Methods

Study Location

This is a cross-sectional study that took place at *Agencia Familiar Binacional* (AFABI), a community based organization (CBO) located in Tijuana's downtown area that serves the Gay and Bisexual community.

Ethics Statement

All research methods were reviewed and approved by the institutional review board at University of California San Diego and Universidad Autónoma de Baja California's Tijuana campus.

Sampling

Participants were recruited through respondent-driven sampling (RDS) (25) between August 2012 and May 2013. Initially, six seeds were selected which were diverse with respect to age, residence within the city, ethnicity, socioeconomic status, sexual self-identification, had large networks sizes (>15 MSM) and were willing to recruit three of their peers. At the mid-point of the study an additional four seeds were included to boost recruitment. Staff at our CBO selected possible candidates and presented them to the research team who subsequently screened for inclusion in the study.

Each seed was given three coupons to recruit other MSMs. Subsequent participants were given the same number of coupons with a three-week expiration date until a target sample size of 200 participants was reached and recruitment was stopped. Participants received an incentive of \$20 US dollars for enrolling, and \$5 dollars for each referral for a maximum total of \$35 dollars. Anyone who participated in the study, was ineligible, or visited the study site was offered free condoms and educational materials on HIV prevention.

A total of 10 seeds recruited 216 participants. One seed did not recruit any participants. The longest recruitment chain was 13, which recruited 59.2% of the sample. Median number of waves was 5 and two-fifths were recruited at or after wave 6. We excluded 15 possible participants as they did not meet eligibility criteria for the following reasons: Eight for not having had sex with a man in the last 12 months; four for having been under the influence of alcohol or drugs at the time of enrollment; and three for residing outside of the city of Tijuana. Thus, the total sample size was 201. Data from seeds were removed from the sample for the purpose of another study on RDS and population estimates, therefore all analyses included an n of 191.

Eligibility criteria

Individuals were eligible to participate if they were 1) biologically male, 2) residents of Tijuana, 3) reported having oral or anal sex with another man in the last 12 months, 4) 18 years or older, 5) had a study coupon (except seeds), and 6) were willing to provide informed consent to participate in the study. Participants were excluded if: 1) they had been previously enrolled in the study, or 2) were obviously under the influence of alcohol and/or another drug at the time of enrollment which may have impaired their ability to give informed consent.

Peer recruits were screened for enrollment at AFABI. Study staff explained the research purpose, study benefits/risks, and peer recruitment component to eligible participants. Those willing to participate provided written informed consent.

Data collection

Trained interviewers collected study related data through a face-to-face interview using a standardized survey. Interviews were held in private rooms and took one to three hours depending on participant's answers.

Measures

We assessed age, sexual orientation, education, and employment. We also asked participants about the syndemic conditions described below, their sexual behavior, and the degree to which they are “out” about having sex with men.

Lifetime Drug Use

We asked participants whether they have ever used any of the following drugs: heroin, inhalants (glue, gasoline), methamphetamines, ecstasy, cocaine, benzodiazepines, barbiturates, amyl nitrate (poppers), gamma-hydroxy butyric acid (GHB), ketamine or other, and possible combinations of these.

Sexual Compulsivity

The Sexual Compulsivity Scale consists of 10 items that “reflect obsessive preoccupations with sexual acts and encounters” ($\alpha = .92$). An example item is, “My sexual appetite has gotten in the way of my relationships”. Items are summed, and consistent with previous research we defined scores of 24 and above as indicating sexual compulsivity (5,26,27).

Depression

We screened for depression using the 21-item Beck Depression Inventory (BDI-II) and used a cutoff score of 17 or above as indicating clinical depression ($\alpha = .84$) (28,29).

Lifetime History of Abuse

In three separate items, participants were asked whether they've ever been forced or coerced to have sex against their will, been physically abused (i.e., hit or assaulted), and been emotionally abused. We defined a lifetime history of abuse as reporting having ever experienced any of these types of abuse.

Internalized Homophobia

We measured internalized homophobia using a nine-item scale used extensively with gay and lesbian populations (30,31). Example items include, “I have tried to stop being attracted to men in general;” and “I feel that being gay/bisexual is a personal shortcoming for me.” Participants responded on a 5-point Likert-type scale with 1 being *strongly disagree* and 5 being *strongly agree*. Scores ranged from 9 to 36 (Mean=19.04, SD=0.45) and the median score was 18. We conducted a median split and participants who scored 19 or higher were defined as endorsing higher internalized homophobia.

Sexual risk-taking

We operationalized “sexual risk-taking” as whether participants engaged in insertive or receptive anal sex without a condom to the point of ejaculation with a stranger in the past two months (yes/no).

HIV Status—All participants underwent HIV rapid testing using Intec Products, Inc. Advanced Quality HIV test kits (Xiamen, China). Positive HIV tests were repeated with another rapid test using a finger-prick sample, and those who tested positive on both tests were confirmed through immunofluorescence assay (IFA) at San Diego Public Health Laboratories (SDPHL). Pretest and posttest counseling was conducted according to national guidelines.

“Outness”

We measured “outness” about having sex with men using an item used in previous research with MSM (32). Participants were asked to, “Please choose the number that best describes how ‘out’ you currently are about having sex with men. By ‘out’, we mean you let others know that you are sexually attracted to men.” Therefore, the item captured sexual behavior with and sexual attraction to other men. Responses were measured on a 7-point Likert type scale with 1 being *not out to anyone*, 4 being *out to half the people I know*, and 7 being *out*

to everyone. For analysis purposes participants were divided into three groups that included: 1) those not being out to anyone to those out to less than half the people they know, 2) those that were out to half the people they know, and 3) those that were out to more than half to all of the people they know.

Statistical analysis

Analyses reported in a previous paper (33) using steps outlined by Spiller (34) for RDS data revealed that there was no effect of sampling method (i.e., clustering) on the data. Specifically, we evaluated homophily and clustering by respondent, geographic area, recruitment chain, and common-recruiter cluster levels using one-way ANOVA, but we found no significant clustering. Therefore, we used unweighted data in all analyses. We first examined descriptives of the syndemic conditions among the sample. We then examined the degree to which the syndemic conditions co-occurred or clustered together by testing all possible bivariate associations among the conditions using logistic regressions. We then sought to replicate the syndemic effect among the entire sample by testing the association between number of syndemic conditions and sexual risk-taking (i.e., engaging in condom unprotected anal sex with a stranger) in the past two months. Finally, we examined “outness” as a moderator of the syndemic effect. Due to diminished cell sizes and consequently low power, we examined moderation by triangulating results from two different approaches. First, we used generalized estimating equations (GEE) to examine the interaction effect between number of syndemic conditions and “outness” (after centering and controlling for main effects) on sexual risk-taking. We determined the magnitude of the interaction effect by converting the odds ratio for the interaction effect to Cohen's *d*. Second, we stratified analyses by testing the association between syndemic conditions and sexual risk-taking within each of the three groups that differed on “outness,” then compared odds ratios. Finally, for comparison we sought to replicate the finding by O'Leary and colleagues and tested whether education (i.e., completing high school vs. not) moderated the syndemic effect.

Results

As shown in Table 1, mean age was 30, two-thirds reported being homosexual, half reported at least a high school education, and a majority were currently employed. Little more than half reported ever using any drug, 19% reported sexual compulsivity, and 16% screened for clinical depression. A little less than half reported a lifetime history of abuse. Only about one-fifth of the sample reported engaging in condom unprotected anal sex with a stranger in the past two months. Most (58%) participants reported being ‘out’ to at least more than half the people they know.

Table 2 displays the bivariate associations among the syndemic conditions. Out of the ten potential significant associations, seven were positive and significant at $p < .05$. The associations between lifetime drug use and abuse, and between depression and internalized homophobia were not statistically significant. There was a marginal positive association between lifetime abuse and internalized homophobia ($p < .10$). The strongest associations were observed between sexual compulsivity and the other syndemic conditions.

We summed the number of syndemic conditions experienced by a given participant, finding 33 (17.3%) reported none of the conditions, 55 (28.8%) reported one, 48 (25.1%) reported two, 33 (17.3%) reported three, 16 (8.4%) reported four, and 6 (3.1%) reported experiencing all five conditions. Figure 1 shows the prevalence of sexual risk-taking by number of syndemic conditions reported. The more conditions a participant reported the more likely he was to report engaging in sexual risk-taking in the past two months. This association was confirmed by a Mantel-Haenszel χ^2 test for linear-by linear association (17.18, $p < .001$), as well as a logistic regression (with number of syndemic conditions entered continuously) (OR=1.74, $p < .001$, 95% CI 1.32 to 2.28).

We used GEE with a binomial distribution and log link function to predict sexual-risk taking. We entered number of syndemic conditions, “outness” and the two-way interaction as predictors. Not surprisingly, due to diminished cells the interaction effect was not statistically significant ($p=0.14$). The odds ratio for the interaction effect was 0.74 (95% CI: 0.50 to 1.10). We converted the odds ratio to Cohen's d using the method described by Sanchez-Meca et al.(35) which yielded $d=0.07$, a medium to large effect size.(36) We also conducted a stratified analysis and tested the association between number of syndemic conditions and sexual risk-taking among participants in each of the three “out” groups. The odds of reporting sexual risk-taking as a function of syndemic conditions was highest among those who reported to only being out <50% of the people they know (OR=3.02, $p=.01$, 95% CI 1.26 to 7.24), and lowest among those who reported being out to >50% of the people they know (OR=1.56, $p=0.02$, 95% CI 1.09 to 2.24). The association among those who were out to 50% of the people they know fell in the middle (OR=1.91, $p=0.03$, 95% CI 1.05 to 3.47). Therefore, the odds of sexual risk-taking in the highest “out” group is almost two times higher than in the lowest “out” group. These results are displayed in Figure 2 and suggest that being “out” to more people helps to attenuate the association between syndemic conditions and sexual risk-taking.

Education as a moderator

A total of 97 (48.3%) men reported completing at least a high school education, whereas 104 (51.7%) did not. We tested the interaction between syndemic conditions and this dichotomous education variable and did not find significance (OR= 1.02, $p= 0.94$, 95% CI 0.58 to 1.79).

Syndemic conditions and HIV status

We also explored whether participants who reported higher syndemic conditions were also more likely to test positive for HIV. This association was not significant (Mantel-Haenszel χ^2 test for linear-by linear association = .004, $p = 0.95$). Among MSM who reported zero syndemic conditions, 6 tested positive (18.2%); among those who reported one, 8 tested positive (14.5%); among those who reported two, 10 tested positive (20.8%); among those with three, 5 tested positive (15.2%); among those with four, 4 tested positive (25.0%); and among those MSM who reported all five conditions, none tested positive.

Discussion

Previous research has demonstrated that psychosocial and health problems co-occur among MSM, and that this co-occurrence interacts to contribute to a higher risk for HIV (5,12). While many studies have provided evidence that experiencing more syndemic conditions is related to more risky sex, less is known about the factors that might moderate this association. One study found that education attenuated the syndemic effect among Black MSM in the U.S.(14) Although we did not replicate this finding, in the current study we provide evidence that a syndemic exists among MSM in Tijuana, and that greater “outness” to others attenuates the association between syndemic conditions and sexual risk-taking. To our knowledge, no previous study has examined a potentially modifiable social factor, like “outness” as a moderator of the syndemic effect.

Despite the cultural ideal of machismo in Mexican culture, a majority of the men (~57%) reported being out to most of the people they know. This may be related to the urban setting of Tijuana, where more progressive views about sex and sexuality may exist compared to other parts of Mexico. This may also be related to more frequent interactions with US-based MSM that cross the San Diego, Tijuana, Mexico border as sexual- and social tourists. Regardless, compared to men who were less out, men who reported dealing with a myriad of negative life conditions who were more out were less likely to report recently engaging in condom unprotected anal sex with a stranger. Men who experience more syndemic conditions and who conceal their sexual behavior with men may feel greater pressure to have their sexual needs met under riskier conditions– without a condom and with a stranger. It may also be that by being out to more people, these men deal with less stress, have greater access to positive social support, and have a stronger connection to the Gay community. Indeed, previous research has shown that degree of “outness” is positively associated with amount, use of, and satisfaction with available social supports.(19,37) Such positive factors related to “outness” suggest that individuals who are more out may be more resilient in the face of negative and chaotic life histories. Future research should more closely examine MSM who are more “out” to identify the psychological and social processes that contribute to resilience among men who experienced more syndemic conditions.

The process of coming out is a complex one. Disclosure of one's sexual identity to friends, family, co-workers, and others may be complicated or discouraged by cultural norms, the stigma of homosexuality, and a legitimate fear of violent repercussions. For example, Latinos tend to come out to fewer people than Whites (38,39). Cultural norms of machismo, homophobia, and sexual silence may make it difficult for Latino gay men to come out, experience their sexual identity positively, and practice healthy behaviors (40). Intervention approaches that acknowledge these complex issues surrounding disclosure may be useful in preventing HIV and promoting general well-being.

The data on syndemics demonstrate that HIV prevention interventions for MSM should be multi-faceted to target multiple conditions including substance use, trauma, depression, and internalized homophobia. In addition, or alternatively, interventions may turn away from deficit-centered models and focus on promoting resilience in the lives of MSM, including positive self-acceptance and social support (15), which may facilitate the coming out

process. Indeed, interventions that aim to empower gay and bisexual men show positive effects on risk behavior (41,42), and that empowerment in the face of sexual prejudice is associated with greater self-efficacy to practice safe sex (43). The MPowerment Project (44,45) in the United States appears to be the most relevant and successful intervention to reduce HIV risks among MSM. The program is based on diffusion of innovations, peer influence, community involvement, and personal empowerment. One defining feature of the program is that it aims to “enrich and strengthen young gay/bisexual men's pride and nurture their exploration and celebration of their sexuality” (44). The program is intended to be tailored to any unique culture or social environment, and similar programs appear to be efficacious for Latino MSM in the US (46). Future research should examine whether the MPowerment Project may be adapted to and efficacious with MSM outside the U.S., including Mexico. Furthermore, interventions that aim to reduce environmental constraints (e.g., reducing public stigma, discrimination, and violence towards MSM) that may limit the ability of MSM to come out are urgently needed.

The results of this study should be viewed in light of its limitations. Although appropriate for the aims of the current paper, our sample may not generalize to MSM in other regions. Our operationalization of risky sex was limited by only including sex with strangers and not other partner types. Similar to other HIV research with MSM, we focused on the behavior of sex with other men (because the behavior is most directly consequential epidemiologically in terms of HIV transmission), and did not frame questions in terms of sexual identity, which is valuable to understand in research examining homophobia and disclosure among MSM. Therefore, while our data suggest that “outness” in terms of sexual behavior and not necessarily sexual orientation may moderate the syndemic effect, it is imperative for future studies to more closely examine the psychological nuances of sexual identity among MSM when studying “outness” and syndemics. Previous syndemic researchers have examined HIV status as a dependent variable. However we were unable to examine this due to low power. Our sample may include male sex workers, gay men, and bisexual men, and future research should examine whether and how the processes shown in this study differ between these men. However, altogether the findings from the current study are useful to inform future HIV prevention interventions with MSM in Tijuana, Mexico.

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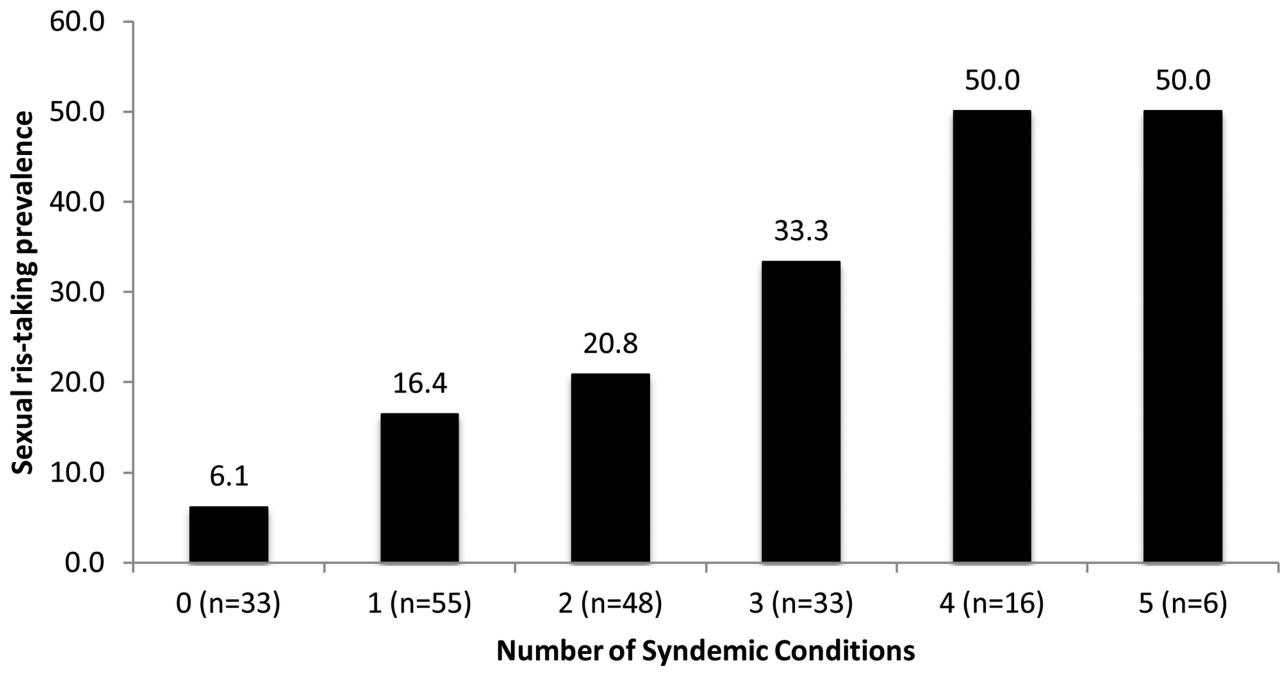
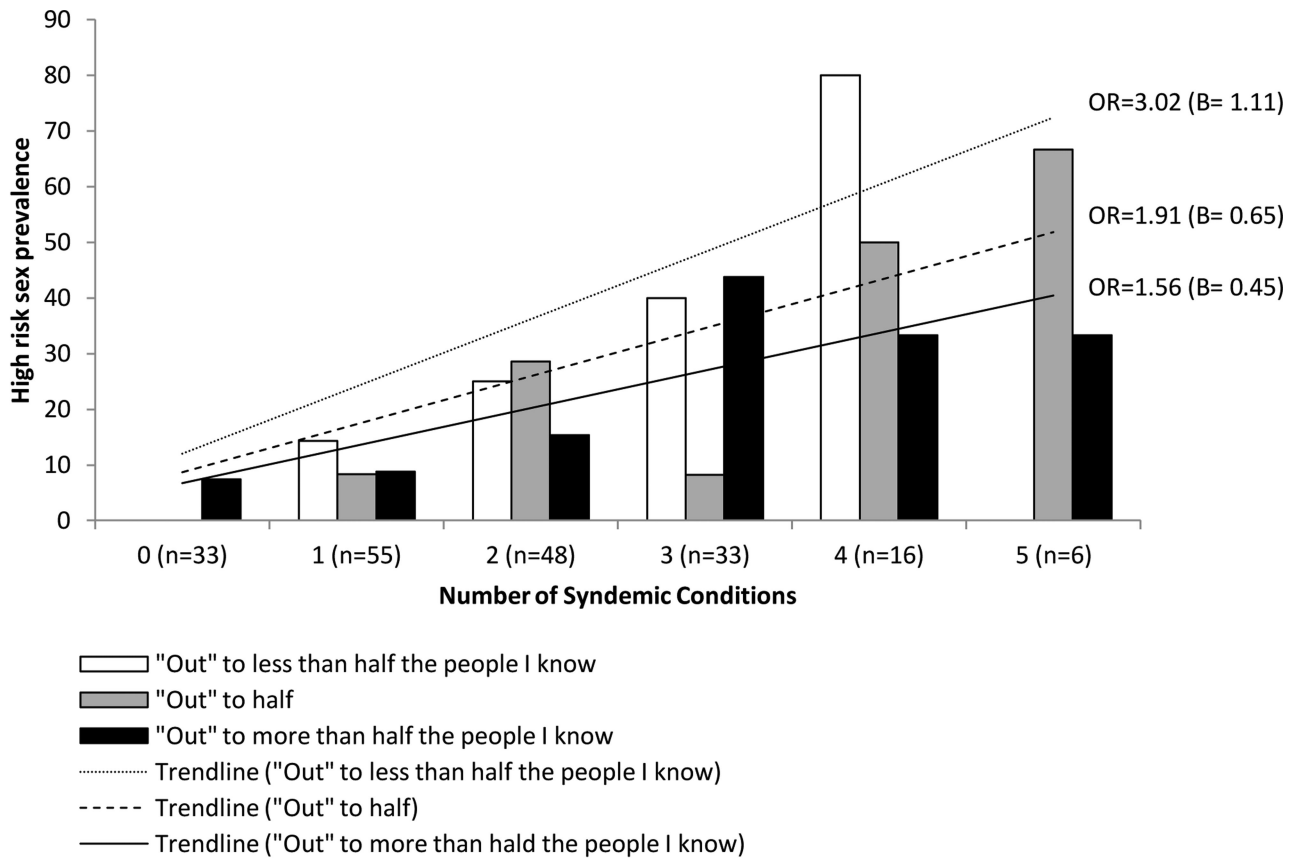


Figure 1. Sexual risk-taking by number of syndemic conditions among MSM in Tijuana, Mexico (n=191)



Notes: Valid n of those “out” to less than half the people they know is 29; valid n of those “out” to half is 46; valid n of those “out” to more than half the people they know is 110. The following cells are empty (no bar displayed): those who report 0 or 5 syndemic conditions and are “out” to less than half the people they know, and those who report 0 conditions and are “out” to half the people they know.

Figure 2. Sexual risk-taking by number of syndemic conditions and “outness” among MSM in Tijuana, Mexico (n=191)

Table 1

Sample characteristics of MSM in Tijuana, Mexico (n=191)

	n	%
<i>Demographics</i>		
Age	Mean=29.7	SD=8.9
Sexual orientation		
Homosexual	119	62.3
Bisexual/heterosexual	72	37.7
Graduated high school or more	104	52.9
Employed	112	58.6
<i>Syndemic conditions</i>		
Lifetime drug use	102	53.4
Higher sexual compulsivity	37	19.4
Positive screen for clinical depression	31	16.2
Lifetime physical/sexual abuse	91	47.6
Higher internalized homophobia	83	43.5
<i>Sexual risk-taking in past 2 mo.</i>	43	22.5
<i>“Outness” about sex with men</i>		
“Not out to anyone” to “out to less than half the people I know”	29	15.2
“Out to half the people I know”	46	24.1
“Out to more than half the people I know” to “Out to everyone”	110	57.6

Table 2

Baseline associations among syndemic conditions among MSM in Tijuana, Mexico (Odds ratios and 95% confidence intervals; n=191)

	Lifetime Drug Use	Sexual Compulsivity	Depression	Lifetime Abuse
Sexual Compulsivity	2.43* (1.12, 5.25)			
Depression	2.44* (1.06, 5.64)	3.41** (1.47, 7.89)		
Lifetime Abuse	1.23 (0.69, 2.17)	3.80*** (1.72, 8.39)	3.89** (1.64, 9.22)	
Internalized Homophobia	1.90* (1.06, 3.42)	6.38*** (2.72, 14.94)	1.52 (0.69, 3.33)	1.74 [†] (0.97, 3.11)

Notes:

[†]
 $p < .10$

*
 $p < .05$

**
 $p < .01$

 $p < .001$