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Stigma, Discrimination, and Substance Use among an Urban Sample Men Who Have Sex with Men in Massachusetts

Abigail W. Batchelder[1,2,3], **Monina Klevens**[4], **Calvin Fitch**[1,3], **Samantha M. McKetchnie**[1,3], **Kenneth H. Mayer**[2,3,5], **Conall O'Cleirigh**[1,2,3]

[1]Department of Psychiatry, Massachusetts General Hospital, Boston, MA

[2]Harvard Medical School, Harvard University, Boston, MA

[3]The Fenway Institute, Fenway Health, Boston, MA

[4]Bureau of Infectious Disease and Laboratory Sciences, Massachusetts Department of Public Health, Boston, MA

[5]Harvard T.H. Chan School of Public Health, Harvard University, Boston, MA

Abstract

Men who have sex with men (MSM) whose intersecting identities or characteristics are stigmatized by society are differentially at risk for acquiring HIV. However, the relationships between specific aspects of identity, discrimination and stigma, and HIV risk behaviors require greater investigation to develop more effective interventions. Data from Boston's 2014 National HIV Behavioral Surveillance MSM cycle were used to assess associations between socio-demographics, structural factors, substance use, discrimination, HIV-stigma, and number of condomless anal sex partners. Of the total sample (n=382), 17.6% reported verbal abuse, 8.3% work-place discrimination, 2.6% health discrimination, and 3.8% physical assault. HIV-stigma beliefs differed by race, sexual-orientation, and income. Those with histories of drug treatment were 9.47 (OR 95%CI: 2.09, 42.79) and 8.29 (OR 95%CI: 2.27, 30.21) times more likely to report health discrimination and physical assault, respectively. Using negative binomial logistic regression, health discrimination and physical assault moderated relationships between substance use and number of condomless anal sex partners such that those who experienced health discrimination or physical assault and substance use reported more partners. Even in Massachusetts, MSM with identities or characteristics marginalized in society disproportionately experience discrimination and stigma. Most notably, experiencing healthcare discrimination or physical assault were both associated with increased sexual risk behavior among MSM who use substances. Decreasing HIV transmission requires reducing discrimination and stigma among those most vulnerable, particularly those using substances.

Keywords

men who have sex with men (MSM); HIV; stigma; discrimination; substance use

Abigail Batchelder, MPH, PhD, Behavioral Medicine, Department of Psychiatry, Massachusetts General Hospital, 1 Bowdoin Square Boston, MA 02114, (t) 617-643-0387, abatchelder@mgh.harvard.edu.

INTRODUCTION

Men who have sex with men (MSM) remain disproportionately affected by sexually transmitted diseases, including HIV infection. Although the number of new HIV infections among MSM in the United States has remained relatively stable in recent years, a striking disparity remains between HIV incidence in MSM compared to non-MSM, with MSM accounting for 67% of all new infections in 2015 (CDC, 2017). The Northeast had the second highest rate of HIV infection (11.6/100,000 people) in the US from 2010–2015. While MSM in Massachusetts account for a smaller percentage (40%) of new infections compared to other states, the rate of HIV infection among MSM (199.6/100,000 people) is 22 times higher than that of non-MSM (8.9/100,000 people; Massachusetts Department of Public Health, 2017). HIV incidence has declined in Massachusetts, but remains a public health concern, particularly among MSM (Cranston et al., 2017).

Socio-demographic and structural factors perpetuate disparities in HIV risk among MSM. Racial and ethnic disparities persist nationally, with black individuals accounting for the highest proportion of new infections compared to other racial and ethnic groups. Hispanic individuals made up nearly one quarter of new HIV infections in 2015 and are one of the only ethnic groups with rising HIV incidence rates (CDC, 2017). Additionally, structural factors and socioeconomic status (SES) have been associated with HIV risk among MSM. For example, unstably housed individuals are three to nine times more likely to be living with HIV compared to stably housed individuals (Kidder et al., 2007). Personal income has also been negatively associated with HIV risk at individual and community levels (Harding et al., 2013; Dolan & Delcher, 2008).

Individual level factors, such as sexual orientation, may also influence HIV risk among MSM, particularly gay versus bisexual-identified men. Bisexual men's HIV risk is higher than heterosexual men, yet lower than men who exclusively have sex with men (Friedman et al., 2014). While this may be attributable to less overall condomless anal sex than gay men, some evidence indicates that bisexual-identified men report more insertive condomless anal sex with casual partners than gay-identified men (Dyer et al., 2013; Feinstein et al., 2018). Further, bisexual men may be less likely to undergo HIV testing and initiate pre-exposure prophylaxis (PrEP) for HIV prevention.

Individuals with intersecting identities or characteristics marginalized in society are more likely to experience prejudice, discrimination, and stigma than majority groups, which are associated with greater HIV risk (Balaji et al., 2017; Lelutiu-Weinberger et al., 2015; Flanders et al., 2016). For example, MSM of color report more stigma than white MSM (Dyer et al., 2013; Hatzenbuehler, Phelan & Link, 2013). Similarly, MSM with lower educational attainment and SES report more stigma than those with higher levels (Balaju et al., 2017). Substance use is also associated with stigma and marginalization and is disproportionately endorsed by MSM compared to heterosexual men (Radcliffe & Stevens, 2008; Kulesza et al., 2016; Stringer & Baker, 2018). Further, substance use is associated with elevated HIV risk (Rendina et al., 2016; Santos et al., 2013; Mimiaga et al., 2008; Luoma et al., 2007; Batchelder et al., 2017; MacKeller et al., 2007). Importantly, stigma

related to substance use may reduce healthcare access, including HIV prevention and treatment (Bogart et al., 2011).

As Massachusetts has made substantial efforts to promote equity, including passing marriage equality and expanding healthcare through state Medicaid (MassHealth; www.mass.gov), it provides a unique setting to examine sexual orientation discrimination and HIV stigma in relation to condomless anal sex among MSM in urban Massachusetts. We hypothesized that higher proportions of men of color would report sexual-orientation discrimination and MSM with histories of substance use and homelessness would endorse higher levels of HIV-related stigma beliefs. Finally, we hypothesized that participants with substance use histories, higher sexual-orientation discrimination, and HIV-related stigma beliefs would report more condomless anal sex.

METHODS

National HIV Behavioral Surveillance System

The National HIV Behavioral Surveillance System (NHBS) uses a standardized protocol to survey and test persons with high-risk behaviors for acquiring HIV infection (described in Balaji et al., 2017). In 3-year cycles, NHBS rotates data collection among three focus populations: MSM, persons who inject drugs, and heterosexuals at increased risk for HIV infection. In 2014, MSM were recruited using venue-based, time–space sampling (MacKellar, 2007). Recruitment followed a careful formative planning process to identify venues where at least 50% of men were MSM. Venues in 2014 included bars and clubs where day and time-periods were selected at random for recruiting participants. At each venue, potential participants were screened to determine whether they were ≥18 years of age, reported ever having had oral or anal sex with a man, resided in the Boston Metropolitan Area, could complete an interview in English or Spanish, and provided informed consent. Trained interviewers used handheld computers to administer a standardized questionnaire.

Anonymous HIV testing was offered to all participants regardless of self-reported HIV infection status. Although recruiting and data collection activities were conducted anonymously, referral to confidential testing and clinical management was provided for individuals testing HIV positive. The Massachusetts Department of Public Health IRB reviewed and approved the study.

Measures

Facets of sexual orientation-related discrimination were assessed using four yes/no questions adapted from previously published surveys which asked, “During the past 12 months, have any of the following happened to you because someone knew or assumed you were attracted to men?”: (1) “You were called names or insulted”, (2) “You were treated unfairly at work or school”, (3) “You were denied or given lower quality healthcare” and, (4) “You were physically attacked or injured” (Huebner et al., 2011; Preston et al., 2004; Raymond et al., 2011). These were categorized as verbal abuse, discrimination at work, healthcare discrimination, and physical assault, respectively.

Beliefs about HIV-related stigma were measured using four Likert-type questions with responses ranging from “strongly disagree” to “strongly agree”: (1) “Most people in Boston are tolerant of gays and bisexuals”, (2) “Most people in Boston would discriminate against someone with HIV”, (3) “Most people in Boston would not be friends with someone with HIV”, and (4) “Most people in Boston think that people who got HIV through sex or drug use have gotten what they deserve” (CDC, 2000).

In addition, the survey included questions about recent stimulant use, history of drug and alcohol treatment, and sexual risk behavior. Stimulant use included any reported cocaine, crack, or amphetamine use in the past 12 months. History of drug and alcohol treatment were dichotomous variables indicating ever participating in treatment programs. Sexual risk was operationalized as number of condomless anal sex male partners in the past 12 months, which was disaggregated for bivariate analyses to 0, 1, or ≥2 partners.

Data Analysis

We describe socio-demographic characteristics, experienced discrimination, perceptions of stigma, proportion of participants who endorsed stimulant use and ever being in substance use treatment, and the number of condomless anal sex male partners (Table I). We then compare the proportion of MSM endorsing each type of discrimination by socio-demographics, substance use variables, and number of condomless anal sex partners. We used Cramer’s V ($\phi_{C,}$ ranging from 0–1) to compare associations between nominal variables (Table II) and conducted bivariate logistic regression models for all significant relationships. We compared mean responses to questions assessing perceptions of stigma by socio-demographics, substance use variables, and number of condomless anal sex partners using independent t-tests and one-way ANOVAs. Finally, given the distribution of unprotected anal sex partners (range 0–200), we conducted negative binomial loglink regression models, using SPSS’ general linear model function to assess whether discrimination (healthcare discrimination and physical assault) interacted with our three substance use variables in relation to number of unprotected anal sex partners (Table III). To understand the identified interactions, we ran one-way ANOVAs comparing means (SDs) among participants endorsing and denying the respective discrimination and substance use variables (Table IV). We used SPSS version 25 for all analyses.

RESULTS

Data were collected between July and December 2014, across 21 unique venues resulting in a final sample of 382 MSM (see Table I for demographics). In bivariate analyses (Table II), while we did not find significant differences in sexual orientation discrimination by race, we identified differences in discrimination by ethnicity, education, income, history of homelessness, stimulant use, history of drug treatment, history of alcohol treatment, and condomless sex. Specifically, Hispanic participants were 4.16 times more likely to report discrimination at work compared to non-Hispanic participants (OR= 4.16; 95%CI:1.82, 9.55; p≤.001). Those with ≤high school diploma were more likely to experience healthcare discrimination compared to those with more education (ϕ_C=0.11, p=.044); however, this was not significant in logistic regression analysis (OR=4.08; 95%CI:0.94,17.74; p=.061).

Additionally, participants with a ≤high school diploma were 5.10 times more likely to be physically assaulted compared to those with more education (OR= 5.10; 95%CI:1.54,16.89; p=.008). Further, those who reported an annual income of <$20,000 were 71% less likely to be verbally abused than those reporting between $20,000-$49,999 (OR=0.29; 95%CI:0.02,0.82; p=.019). Finally, those who reported a history of homelessness were 8.27 times more likely to be discriminated in healthcare settings (OR 95%CI:1.08,63.06; p= .042) and 9.39 times more likely to be physically assaulted than those who had not been homeless (OR 95%CI:2.10,42.03; p=.003).

In addition, experiences of healthcare discrimination and physical assault differed by substance use history and number of condomless sex partners. Experience of physical assault significantly differed by stimulant use (ϕ_C=0.21, p=.046); however, this relationship was not significant in a logistic regression (OR= 4.78; 95%CI: 0.91, 25.15; p=.065). Further, individuals with a history of drug and alcohol treatment were 9.47 (OR 95%CI: 2.09, 42.79; p=.003) and 5.65 (OR 95%CI: 1.28, 24.85; p=.022) times more likely to experience healthcare discrimination compared to those with no drug and alcohol treatment history, respectively. Additionally, those with a history of drug and alcohol treatment were 8.29 (OR 95%CI: 2.27, 30.21; p≤.001) and 10.50 (OR 95%CI: 3.16, 34.90; p≤ .001) times more likely to be physically assaulted compared to those with no drug and alcohol treatment history, respectively. The number of unprotected anal sex partners (0, 1, ≥2) was also associated with physical assault (ϕ_C =0.141, p=.045); however, this relationship was not significant in logistic regression (OR=1.04; 95%CI:0.51,2.13, p=.912).

We identified bivariate relationships between beliefs of HIV-related stigma and race, sexual orientation, education level, income, and history of homelessness. Specifically, white participants reported greater agreement that people are tolerant of sexual minorities compared to non-white participants (F(2, 307)=9.93, p≤ .001). Black participants reported greater agreement with “most people think people living with HIV got what they deserve” compared to non-black participants (F(2, 312) =3.48, p=.032). Additionally, bisexual participants reported significantly more disagreement with “others are tolerant of sexual minorities” (t(311)=−4.96, p≤ .001) and greater agreement with “others think that people living with HIV got what they deserved” (t(309)=2.13, p=.034) compared to gay participants. Participants with ≤high school education reported greater disagreement with “others are tolerant of sexual minorities” (t(311)=3.87, p≤.001) and greater agreement with “most people would discriminate against someone with HIV” (t(316)=−2.09, p=.017) compared to those with more education. We also identified a difference in agreement with “people are tolerant of gays and bisexuals” by income, in that those reporting annual income of <$20,000 reported more disagreement compared to those reporting annual incomes of between $20,000 and $49,999 and ≥ $50,000 (F(1, 307)= 5.84, p=.016). Those with a history of homelessness reported greater disagreement with “people are tolerant of gays and bisexuals” (t(311)=−2.43, p=.016), greater agreement with “most people would discriminate against someone with HIV” (t(316)= 2.55, p=.011), and greater agreement with “most people would not be friends with someone with HIV” (t(316)=2.13, p=.015) compared to those with no history of homelessness.

Finally, as we hypothesized that discrimination and substance use would be associated with higher levels of condomless sex, we ran a series of negative binomial regression models including either healthcare discrimination or physical assault and each of three measures of substance use (stimulant use in the past year, history of drug treatment, and history of alcohol treatment). All three measures of substance use significantly moderated the relationships between both healthcare discrimination and physical assault and the number of condomless anal sex partners (see Table III), such that those who reported substance use and discrimination reported significantly more condomless sex partners (Table IV). For example, the mean (SD) number of partners among those who reported stimulant use and healthcare discrimination was 80.67 (105.46) versus 4.03 (7.67) among those who reported stimulant use and no healthcare discrimination, 2.00 (1.00) among those who denied stimulant use and reported healthcare discrimination, and 1.37 (3.24) among those who denied both stimulant use and healthcare discrimination ($F(3,184)= 41.58$, $p \leq .001$).

DISCUSSION

Healthcare discrimination, physical assault, and HIV-related stigma beliefs differed across demographic and structural characteristics, as well as substance use, and high-risk sexual behaviors in this sample of MSM in Massachusetts. Specifically, those with less education and history of homelessness and substance use treatment reported more healthcare discrimination and physical assault, consistent with other samples (Davila et al., 2018; McKirnan et al., 2012). Consistent with the previous national NHBS MSM cycle, higher proportions of MSM subject to social marginalization reporting healthcare discrimination and physical assault (Balaji et al., 2013).

Our most notable finding was that substance use (measured as stimulants in the past year and history of alcohol or drug treatment) was associated with healthcare discrimination and physical assault, and together substance use and both forms of discrimination were associated with more condomless anal sex. To our knowledge, this is the first-time interactions between substance use and both healthcare discrimination and physical assault have been associated with higher levels of HIV risk behaviors in a sample of urban MSM. While the causal directions are unknown, the identified associations between discrimination and substance use are consistent with emerging evidence (Rogers et al., 2018). The interaction between healthcare discrimination and substance use in relation to HIV risk behaviors may be attributable to substance use stigma in healthcare settings, which may lead to avoidance of sexual self-care behaviors such as condom use. Substance use may also lead to higher risk situations, increasing exposure and vulnerability to physical assault and decreasing one’s ability to negotiate condom use. These findings indicate a need to better understand relationships between sexual self-care and healthcare discrimination and physical assault among marginalized MSM, particularly those who use substances (Eaton et al., 2015).

We also identified differences in the experiences of specific types of discrimination by ethnicity. Specifically, Hispanic MSM reported more workplace discrimination, consistent with national trends indicating that approximately half of Hispanic-Americans experience discrimination in the workplace (Krogstad & Lopez, 2018). Nationally representative data

indicate that Hispanic-Americans and those with lower educational attainment experience more sexual orientation discrimination (Slater et al., 2017).

A less straightforward relationship was identified between discrimination and income. Specifically, those reporting annual income between $20,000 and $49,999 were more likely to report verbal abuse than those reporting either <$20,000 or ≥$50,000. The higher proportion of verbal abuse among moderate income ($20,000-$49,999) participants may be indicative of those with lower-moderate SES residing in environments that are less accepting of MSM, as higher levels of education are associated with less homonegativity (McGarrity & Huebner, 2014; Walch, Orlosky & Kimberly, 2010).

In addition, we identified several demographic differences in perceptions of HIV-related stigma, consistent with literature indicating people with intersecting marginalized characteristics experience more stigma (Bogart et al., 2017; Rice et al., 2018). Those with marginalized or stigmatized identities (i.e., non-white, bisexual, ≤high school education, and/or history of homelessness) were more likely to perceive others as less tolerant of sexual minorities and anticipate discrimination against those living with HIV. These findings are consistent with recent findings on intersecting stigmas (Wilson et al., 2016) and may be associated with the perpetuation of HIV-related disparities among MSM with multiple marginalized identities (Parker et al., 2017).

While this study provides insight into the socio-demographic differences in discrimination and HIV-related stigma among MSM in Massachusetts, it has several limitations. First, it is not representative of all MSM in Massachusetts or the US. Additionally, MSM attending venues may be more likely to use substances and engage in unprotected sex, potentially affecting the generalizability of the sample. Relatedly, several investigated variables had limited prevalence (e.g., 6% reported homelessness). Given the nature of the NHBS data collection, several questions that might elucidate our findings were not asked (e.g., participants were not asked about intimate partner violence or internalized stigma). Further, the cross-sectional nature of the results prevents investigation of the temporal relationships between variables. Finally, all results are self-reported, limiting the ability to confirm accuracy.

These results have several clinical implications. First, approximately one fifth of the sample reported experiencing verbal discrimination related to sexual orientation, indicating that even in Massachusetts, discrimination remains a problem for MSM, particularly those with a history of homelessness and substance use. Second, our results highlight the importance of considering intersecting identities, including history of substance use, when considering discrimination and stigma. Third, reducing negative attitudes or beliefs about clients who use substances may reduce healthcare discrimination. Further, challenging the stigma or discrimination clinicians may feel toward patients with stigmatized identities or characteristics, including those who use substances, will benefit the patients and may lead to reductions in high-risk sex. Finally, interventions designed to reduce discrimination and stigma in healthcare settings that serve MSM, particularly those who use substances, are urgently needed (Eaton et al., 2015).

Ultimately, this work conveys that even in a relatively tolerant state with strong civil liberties traditions, such as Massachusetts, MSM with a wide array of socio-demographic, structural, and behavioral characteristics commonly experience verbal abuse. Those living with intersecting stigmatized identities are most affected by discrimination. Further, those with a history of substance use and who have experienced healthcare discrimination and physical assault may be more likely to engage in HIV risk behaviors. These results point to the combined negative effect of experienced discrimination in conjunction with substance use. We must strive to better understand and reduce discrimination and stigma among those most vulnerable to HIV, including MSM who use substances, to improve productive engagement in healthcare and reduce HIV infection and transmission.

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Table I:

Reported Demographic, Socioeconomic and Substance Use Characteristics of a Sample of Men Who Have Sex with Men in Massachusetts, with Responses to Questions Related to Discrimination and Stigma (N=382)

Demographic Characteristics and Substance Use		**% (n)**
AGE M(SD) years		35.50 (12.32)
Race		
	White	73.30% (280)
	Black or African American	17.30% (66)
	Other	9.40% (36)
Ethnicity		
	Hispanic or Latino/a	18.44% (71)
	Not Hispanic or Latino/a	81.56% (314)
Sexual Orientation		
	Heterosexual or “straight”	1.30% (4)
	Homosexual/ Gay	88.33% (280)
	Bisexual	10.41% (33)
Education		
	<=High School Diploma	14.40% (46)
	Technical Degree	16.90% (54)
	Bachelor’s Degree	38.10% (122)
	More than a Bachelor’s Degree	30.60% (98)
Annual Household Income		
	$0-$19,999	17.10% (54)
	$20,000-$49,999	29.10% (92)
	$50,000 or more	53.80% (170)
Homelessness		
	Currently	4.08% (16)
	Ever	5.94% (19)
Stimulant Use in the past 12 months (n=195)		
	Any (67)	35.90% (70)
	None (122)	64.10% (125)
Drug Treatment Ever		
	No	93.10% (296)
	Yes	6.90% (22)
Alcohol Treatment Ever		
	No	89.62% (285)
	Yes	10.38% (33)
Unprotected Anal Sex Partners in Past 12 Months:		
	0	53.20% (206)
	1	26.40% (102)
	≥2	20.4% (79)

Demographic Characteristics and Substance Use		% (n)
Discrimination Variables		**% (n)**
Gay-Identified: Verbal Discrimination		
	No	82.43% (258)
	Yes	17.57(55)
Gay-Identified: Poor Services		
	No	91.37 (286)
	Yes	8.63(27)
Gay-Identified: Work Discrimination		
	No	91.69(287)
	Yes	8.31(26)
Gay-Identified: Health Discrimination		
	No	97.44(304)
	Yes	2.56(8)
Gay-Identified: Physical Assault		
	No	96.17% (301)
	Yes	3.83% (12)
Stigma-Related Beliefs		**Mean (SD) 1=strongly agree-5=strong disagree**
People are tolerant of gays and bisexuals		
	Strongly agree	26.20(82)
	Agree	59.11(185)
	Neither agree nor disagree	10.86(34)
	Disagree	3.19(10)
	Strongly disagree	0.64(2)
Most people would discriminate against someone with HIV		
	Strongly agree	10.7% (34)
	Agree	29.9% (95)
	Neither agree nor disagree	24.5% (78)
	Disagree	31.4% (100)
	Strongly disagree	3.5% (11)
Most people would not be friends with someone with HIV.		
	Strongly agree	1.6% (5)
	Agree	7.9% (25)
	Neither agree nor disagree	19.5% (62)
	Disagree	52.2% (166)
	Strongly disagree	18.9% (60)
Most people think that people who got HIV through sex or drug use have gotten what they deserve		
	Strongly agree	2.2% (7)
	Agree	11.6% (37)
	Neither agree nor disagree	21.4% (68)
	Disagree	45.0% (143)

Demographic Characteristics and Substance Use	% (n)
Strongly disagree	19.8% (63)
Most people would support the rights of a person with HIV to live and work wherever they want to.	
Strongly agree	19.5(62)
Agree	60.1 (191)
Neither agree nor disagree	14.5(46)
Disagree	5.0(16)
Strongly disagree	0.9 (3)

Table II:

Bivariate Associations

		Experienced Gay-Related Discrimination in the Form of:				Likelihood that…			
		Verbal Abuse	**Discrimination at Work**	**Healthcare Discrimination**	**Physical Assault**	**People are tolerant of gays and bisexuals…**	**Most people would discriminate against someone with HIV…**	**Most people would not be friends with someone with HIV…**	**Most people think that people who got HIV through sex or drug use have gotten what they deserve**
		% (n) Reported Discrimination				**Mean(SD) (1=strongly agree-5=strongly disagree)**			
Overall (n=382)		17.6% (62)	8.3% (32)	2.6% (10)	3.8% (15)	1.93 (.74)	2.87 (1.08)	3.79 (.89)	3.69 (.99)
Race:	White (n=225)	18%(41)	7%(15)	2%(4)	4%(9)	1.83(.65)***	2.89(1.80)	3.80(.88)	3.75(.97)*
	Black[a] (n=56)	12%(7)	12%(7)	4%(2)	4%(2)	2.30(.87)	2.76(1.07)	3.72(.95)	3.38(1.09)
	Other[b] (n=29)	24%(7)	14%(4)	7%(2)	3%(1)	2.00(.93)	2.90(1.11)	3.76(.91)	3.79(.82)
Ethnicity:	Non-Hispanic (n=252)	18%(45)	6%(14)***	2%(5)	4%(9)	1.90(.71)	2.86(1.08)	3.76(.89)	3.68(1.01)
	Hispanic (n=61)	16%(10)	20%(12)	5%(3)	5%(3)	2.07(.87)	2.92(1.08)	3.90(.90)	3.73(.93)
Sexual Orientation:									
	Gay/Homosexual (n=280)	18%(51)	8%(22)	3%(7)	3%(9)	1.86(.69)***	2.90(1.05)	3.81(.87)	3.73(.96)*
	Bisexual (n=33)	12%(4)	12%(4)	3%(1)	9%(3)	2.52(.94)	2.63(1.26)	3.59(1.10)	3.34(1.10)
Education:	≤High School (n=42)	17%(7)	12%(5)	7%(3)*	12%(5)**	2.33(1.10)***	2.57(1.21)*	3.57(1.00)	3.50(1.15)
	≥ Some College (n=271)	8%(48)	8%(21)	2%(5)	3%(7)	1.87(.67)	2.92(1.05)	3.83(.87)	3.72(.96)
Annual Household Income:									
	<$20,000(n=51)	10%(5)**	10%(5)	6%(3)	8%(4)	2.16(.95)*	2.81(1.12)	3.59(1.00)	3.57(.92)
	$20,000–$49,999(n=92)	27%(25)	12%(11)	1%(1)	4%(4)	1.96(.82)	2.70(1.13)	3.91(.80)	3.80(1.00)
	≥$50,000(n=166)	14%(24)	6%(10)	2%(4)	2%(4)	1.83(.59)	2.99(1.03)	3.80(.90)	3.67(.99)
Ever Homeless:	Yes (n=17)	18% (3)	18% (3)	12% (2)*	24% (4)***	2.35(1.11)*	2.26(1.28)*	3.37(1.17)*	3.26(1.24)

		Experienced Gay-Related Discrimination in the Form of:				Likelihood that…			
		Verbal Abuse	**Discrimination at Work**	**Healthcare Discrimination**	**Physical Assault**	**People are tolerant of gays and bisexuals…**	**Most people would discriminate against someone with HIV…**	**Most people would not be friends with someone with HIV…**	**Most people think that people who got HIV through sex or drug use have gotten what they deserve**
		% (n) Reported Discrimination				**Mean(SD) (1=strongly agree-5=strongly disagree)**			
	No (n=296)	18% (52)	8% (23)	2% (6)	3% (8)	1.91(0.71)	2.91(1.06)	3.82(0.87)	3.71(0.97)
Stimulant Use in Past 12 Months:									
	Any(n=67)	19%(13)	9%(6)	4%(3)	12%(8) **	1.99(.81)	2.71(1.12)	3.64(1.01)	3.64(1.05)
	None(n=122)	17%(21)	10%(12)	2%(3)	2%(3)	1.91(.73)	2.78(1.01)	3.89(.82)	3.76(.92)
Drug Treatment Ever:	Yes(n=21)	29%(6)	19%(4)	14%(3) ***	19%(4) ***	2.05(.92)	2.59(1.22)	3.73(.94)	3.68(1.00)
	No(n=290)	17%(49)	8%(22)	2%(5)	3%(8)	1.92(.73)	2.89(1.07)	3.79(.89)	3.69(.99
Alcohol Treatment Ever:	Yes(n=32)	22%(8)	16%(5)	9%(3) **	19%(6) ***	1.97(.93)	2.64(1.17)	3.73(1.04)	3.88(.96)
	No(n=279)	17%(47)	8%(21)	2%(5)	2%(6)	1.93(.72)	2.90(1.07)	3.80(.88)	3.66(.99)
Unprotected Anal Sex Partners in Past 12 Months:	0(n=136)	14%(19)	8%(11)	2%(3)	5%(7) *)	1.99(8.25)	2.86(1.01)	3.85(.81)	3.67(.93)
	1(n=101)	22%(22)	6%(6)	1%(1)	0%(0)	1.86(.60)	2.97(1.05)	3.81(.81)	3.81(.88)
	≥2(n=76)	18%(14)	12%(9)	5%(4)	7%(5)	1.92(.76)	2.77(1.23)	3.66(1.11)	3.56(1.20)

[a] Includes all participants who identified as Black or African American in addition to other races.

[b] Other includes American Indian, Asian, Native Hawaiian, other Pacific Islander, and other.

* p≤0.05;

** p≤0.01;

*** p<0.001

Table III.

Negative Binomial Regression Models of Discrimination (health and physical) and Substance Use (stimulant use, history of drug treatment, and history of alcohol treatment) on number of unprotected anal sex partners among MSM in Massachusetts.

	Incident Rate Ratio (IRR)	95%CI
Model 1		
Health discrimination	0.05***	0.02–0.16
Stimulant use	0.03***	0.00–0.15
Health discrimination X Stimulant use	13.74***	2.20–85.61
Model 2		
Health discrimination	0.04***	0.01–0.15
Drug treatment	0.02***	0.00–0.08
Health discrimination X Drug treatment	32.19***	5.69–182.00
Model 3		
Health discrimination	0.05***	0.02–0.18
Alcohol treatment	0.02***	0.00–0.08
Health discrimination X Alcohol treatment	23.17***	4.23–126.84
Model 4		
Physical discrimination	0.18***	0.09–0.39
Stimulant use	0.03***	0.00–0.17
Physical discrimination X Stimulant use	11.50*	1.62–81.14
Model 5		
Physical discrimination	0.12***	0.04–0.36
Drug treatment	0.03***	0.01–0.10
Physical discrimination X Drug treatment	10.43**	2.45–44.33
Model 6		
Physical discrimination	0.19***	0.08–0.46
Alcohol treatment	0.05***	0.02–0.20
Physical discrimination X Alcohol treatment	4.36*	1.12–16.93

* p≤0.05;

** p≤0.01;

*** p<0.001

Notably, the results did not change substantially when including age and race as covariates.

Table IV.

Average Number of Unprotected Sex Partners by Discrimination and Substance Use

	No Health Discrimination Mean (SD)	**Health Discrimination Mean (SD)**
No Stimulant Use	1.37 (3.24)	2.00 (1.00)
Stimulant Use	4.03 (7.67)	80.67 (105.46)
	F (3, 184)= 41.58, p ≤ .001	
No Drug Treatment	1.68 (4.27)	1.20 (1.30)
Drug Treatment	3.50 (4.99)	80.67 (105.46)
	F (3, 184)= 41.58, p ≤ .001	
No Alcohol Treatment	1.51 (3.64)	1.20 (1.30)
Alcohol Treatment	4.38 (8.03)	80.67 (105.46)
	F (3, 306) = 68.97, p ≤ .001	
	No Physical Assault	Physical Assault
No Stimulant Use	1.40 (3.23)	0.67 (1.15)
Stimulant Use	4.86 (9.30)	26.63 (70.12)
	F (3, 185) = 7.49, p≤ .001	
No Drug Treatment	1.67 (4.26)	1.38 (3.16)
Drug Treatment	5.94 (10.60)	51.00 (99.34)
	F (3, 307)= 27.46, p ≤ .001	
No Alcohol Treatment	1.49 (3.62)	1.83 (3.60)
Alcohol Treatment	6.35 (11.08)	34.00 (81.32)
	F (3, 307) = 17.03, p ≤ .001	