

Beyond Anal Sex: Sexual Practices Associated with HIV Risk Reduction among Men Who Have Sex with Men in Boston, Massachusetts

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Abstract

Men who have sex with men (MSM) continue to bear a disproportionate HIV and sexually transmitted disease (STD) burden. The current study examined the frequency and associations of sexual risk reduction behaviors among a sample of MSM in the greater Boston, Massachusetts area. One hundred eighty-nine MSM completed a one-time behavioral and psychosocial assessment between March 2006 and May 2007. Logistic regression procedures examined the association of demographic, psychosocial, and behavioral factors with risk reduction practices. Twenty percent of the sample reported rimming, mutual masturbation, digital penetration, using sex toys, or 100% condom use as a means to reduce their risk of acquiring or transmitting HIV in the prior 12 months. In bivariate analyses, risk reducers were more likely to disclose their MSM status (i.e., be “out”; odds ratio [OR] = 3.64; $p < 0.05$), and report oral sex with a condom in the prior 12 months (OR = 4.85; $p < 0.01$). They were less likely to report: depression (Center for Epidemiologic Studies Depression Scale [CES-D] score 16+; OR = 0.48; $p < 0.05$), a history of one or more sexually transmitted diseases (STDs; OR = 0.40; $p < 0.05$), and meeting sexual partners at public cruising areas (OR = 0.32; $p < 0.01$). In a multivariable model, risk reducers were less likely to report: alcohol use during sex (adjusted odds ratio [AOR] = 0.33; $p < 0.05$), depression (CESD score 16+; AOR = 0.32; $p < 0.05$), or meeting sexual partners at public cruising areas (AOR = 0.30; $p < 0.05$), or via the Internet (AOR = 0.12; $p < 0.05$) in the previous 12 months. Identifying and understanding such factors associated with risk reduction behaviors may be important to consider in designing effective prevention interventions to promote sexual health for MSM.

Introduction

IN THE UNITED STATES, men who have sex with men (MSM) continue to be disproportionately at risk for sexually transmitted diseases (STDs),^{1,2} including HIV.³ According to the Centers for Disease Control and Prevention (CDC), MSM constituted 67% of new HIV/AIDS infections among United States men and 49% of all persons living with HIV/AIDS diagnosed in 2006.³ In Massachusetts, the proportion of male HIV diagnoses with male-to-male sex as the primary reported exposure increased from 40% in 1999 to 57% in 2006⁴ and data from several national and Massachusetts studies suggest that an increasing number of MSM are acquiring STDs.^{2,5,6}

Unprotected anal intercourse (UAI) remains the riskiest sexual transmission behavior for HIV acquisition and/or

transmission among MSM. Not surprisingly, public health efforts aimed at primary and secondary HIV prevention, as well as epidemiologic research examining HIV/STD trends among MSM, have focused on determining the factors associated with unprotected sex.^{7–15} In particular, a number of studies have shown drug use^{7–10,12} and alcohol use^{10,13–15} during sex to be associated with HIV transmission risk.

However, is penile–anal intercourse the only “exciting” and “gratifying” sexual practice MSM can engage in? If advocating condom use during anal sex continues to be a turn off for some at-risk MSM, might HIV prevention efforts benefit from finding other diverse sexual messages? MSM engage in a wide variety of sexual practices; however, the frequency of other sexual behaviors among MSM remains understudied. HIV research has generally not focused on the practice of alternate sexual behaviors as a risk reduction outcome or focused on

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those demographic, psychosocial, and behavioral factors associated with sexual risk reduction practices among MSM, which may have implications for designing and tailoring sexual health prevention interventions.

We sought to (1) explore the frequency of alternative sexual behaviors that would not transmit HIV, including rimming, mutual masturbation, digital penetration, sex toys, and 100% condom use among a sample of MSM in the greater Boston, Massachusetts, area and (2) examine the demographic (age, race/ethnicity, education, income, sexual identity disclosure, HIV status, STD history), psychosocial (depression, drug and alcohol use), and behavioral factors (frequency of unprotected sex, meeting sex partners via public cruising area or Internet) associated with using any of these behaviors as a risk-reduction strategy. We hypothesized that abstaining from drug and alcohol use during sex would be significantly associated with decreased HIV risk behaviors and increased alternative behaviors among MSM. Data for the current study came from a larger study designed to investigate partner notification experience and attitudes among MSM in Massachusetts.¹⁶

Methods

Participants and procedures

Between March 2006 and May 2007, 189 participants completed a behavioral assessment self-report battery. All study activities took place at Fenway Community Health (FCH), a freestanding health care and research facility specializing in HIV/AIDS care and serving the needs of the lesbian, gay, bisexual, and transgender (LGBT) community in greater Boston.¹⁷ The FCH Institutional Review Board approved the study, and each study participant completed an informed consent process with a trained researcher. Support for this project came from the Massachusetts Department of Public Health.

Recruitment

A convenience sample of MSM ($n = 189$) was recruited via advertisements in the clinical and medical areas at FCH and via word-of-mouth referral. Participants were screened via telephone by trained study staff and were deemed eligible if they were: (1) male, (2) age 18 years or older, (3) a Massachusetts resident, and (4) self-reported having sex with men. Participants were compensated \$40 for their participation in the study.

Study instruments

Primary outcome. The primary outcome was a dichotomous measure of risk in the past 12 months. A composite variable was created to assess risk reduction to include five sexual behaviors: (1) rimming (either rimming or being rimmed), (2) mutual masturbation, (3) digital penetration (inserting finger[s] in the anus), (4) using sex toys, and (5) 100% condom use. Participants were asked whether they practiced rimming, mutual masturbation, digital penetration, or using sex toys in the past 12 months to specifically reduce their risk of acquiring or transmitting HIV. Participants answering "yes" to at least one of these five practices were considered to be risk reducers; those reporting "no" to all of these were considered non-risk reducers. Participants who reported condom use 100% of the time in the prior 12 months were also

considered to be risk reducers; those reporting unprotected anal sex in the prior 12 months were considered non-risk reducers.

Primary independent variables of interest. Our primary independent variables of interest were dichotomous measures of having sex while drunk (5 drinks of alcohol) and having sex while using drugs (crystal methamphetamine, ecstasy, marijuana, or poppers). Drug and alcohol use questions were adapted from the Centers for Disease Control and Prevention's National HIV Behavioral Surveillance Survey, MSM cycle,^{18,19} and from a previous FCH study.²⁰

Other independent variables of interest. We controlled for age and income, which were continuous variables, and a number of dichotomous demographic and risk variables, including race/ethnicity, sexual identity disclosure ("out" about being MSM or not), education level (high school/GED or less), HIV status, STD history (reported a prior history of one or more STDs: syphilis, gonorrhea, Chlamydia, other or not), and sexual partner meeting venues in past 12 months (public cruising areas, bars/clubs, Internet or not). Demographic, sexual behavior, drug use, HIV serostatus, and STD history questions were adapted from the Centers for Disease Control and Prevention's National HIV Behavioral Surveillance Survey, MSM cycle,^{18,19} and from a previous FCH study focusing on perceptions of risk for HIV/STDs.²⁰

Additionally, we adjusted for depression (dichotomous measure based on a CESD score cutoff of 16 or greater).²¹ Depressive symptoms were assessed with the Center for Epidemiologic Studies Depression Scale (CES-D), a validated screener for clinically significant distress as a marker for clinical depression (coefficient $\alpha = 0.90$; Cronbach $\alpha = 0.89$).^{21,22} The 20-items were scored on a 4-point Likert scale from 0 to 3, with a score of 16 or greater indicative of depressive symptoms.

Data analysis

For the present paper, SAS[®] version 9.1.3 statistical software (SAS Institute Inc., Cary, NC) was used to perform each analysis, where statistical significance was determined at the $p < 0.05$ level. The distribution and range of each variable was assessed. We performed χ^2 global tests of independence to test independent associations between risk reducers and non-risk reducers. Mean differences were calculated using independent t test statistics. Bivariate logistic regression analyses were conducted for all independent variables in order to assess their associations with the outcome. A final multivariable model was run to examine the association between drug and alcohol use and sexual risk reduction behaviors in the past 12 months.

Results

Descriptive statistics

Demographics. Table 1 outlines demographic characteristics of the sample shown by non-risk reducers ($n = 151$) and risk reducers ($n = 38$). Twenty percent of the sample ($n = 38$) reported having engaged in the following activities as a means of risk reduction in the past 12 months: rimming (8%), mutual masturbation (17%), digital penetration or using sex toys (5%), and 100% condom use (20%).

TABLE 1. DEMOGRAPHIC CHARACTERISTICS OF THE STUDY SAMPLE (n = 189) BY RISK REDUCERS VS. NON-RISK REDUCERS^a

	Non-risk reducers n = 151	Risk reducers n = 38
Age		
Mean (SD)	41.80 (7.63)	39.74 (10.49)
Race/Ethnicity		
White	48%	39%
Non-white	52%	61%
Education level		
High school/GED or less	26%	34%
Some college, college, or postgraduate	74%	66%
Sexual identity		
Gay identified	58%	66%
Disclosure of identity ("out") ^b	81%	87%
HIV status and STD history		
HIV-infected	52%	47%
Prior STD diagnosis	52%	37%
Sexual behavior in past 12 months		
Mean (SD) number of male sex partners ^b	15.34 (29.01)	9.42 (20.55)
Mean (SD) number of anonymous male sex partners ^b	9.40 (21.96)	3.73 (8.96)
Mean (SD) number of female sex partners ^b	1.74 (7.21)	3.71 (14.68)
Unprotected anal (insertive or receptive) sex	100%	0%
Oral sex with a condom ^c	4%	21%
Fisting	13%	11%
Using sex toys	23%	16%
Rimming (rimming or being rimmed) ^b	58%	39%
Mutual masturbation	73%	84%
Meeting sexual partners in past 12 months		
Bar/club	34%	37%
Social gathering	41%	47%
Public cruising ^b	36%	18%
Private sex party	14%	8%
Internet ^b	25%	13%
Substance use during sex in past 12 months		
Alcohol (sex while "drunk")	52%	47%
Poppers	40%	32%
Crystal methamphetamine	21%	13%
Ecstasy	11%	21%
Marijuana	44%	47%
Psychosocial		
Depressive symptoms (CES-D score 16)	46%	34%

^aComparisons were made across risk reducers versus non-risk reducers groups using chi square statistics and mean (and standard deviation) differences were calculated using t-test statistics.

^b $p < 0.05$

^c $p < 0.01$

SD, standard deviation; STD, sexually transmitted disease; CES-D, centers for epidemiologic studies depression scale.

Bivariate associations of demographic and sexual/behavioral variables to reporting risk reduction

Demographics. Participants who disclosed their sexual identity (i.e., reported being "out") were more likely to be risk reducers (OR = 3.64; 95% confidence interval [CI] = 1.04–12.80) than those who were not "out" (Table 2).

HIV status and STD history. Participants reporting one or more prior STDs (OR = 0.40; 95% CI = 0.19–0.85) were less likely to have engaged in risk reducing behaviors relative to men who did not report a STD history.

Sexual risk behavior. Participants who met their sexual partners at public cruising areas (OR = 0.32; 95% CI = 0.13–0.79) and via the Internet (OR = 0.38; 95% CI = 0.14–1.06) in

the past 12 months were less likely to have engaged in risk reduction behaviors compared to participants who did not meet partners at these venues (Table 2). Men who reported having had oral sex with a condom in the prior 12 months (OR = 4.85; 95% CI = 1.63–14.45) were more likely to be risk reducers. Compared to non-risk reducers, risk reducers had a lower mean number of male sex partners (9.4 versus 15.3) and anonymous sex partners (3.7 versus 9.4), but a higher number of female sex partners (3.7 versus 1.7) (all $p < 0.05$; Table 1). No other significant differences we observed in sexual behavior comparing risk reducers and non-risk reducers.

Depression. Men who were depressed tended to be less likely (OR = 0.48; 95% CI = 0.22–1.01) to have engaged in risk reduction activities relative to men who were not depressed.

TABLE 2. BIVARIATE AND MULTIVARIABLE LOGISTIC REGRESSION ANALYSES EXAMINING THE ASSOCIATION BETWEEN PREDICTOR VARIABLES AND BEING A RISK REDUCER

	Odds ratio	95% CI	Adjusted odds Ratio ^a	95% CI
Race/Ethnicity				
Non-white	—		—	
White	0.54 ^b	0.26–1.14	0.88	0.24–2.36
Sexual identity disclosure				
Not out	—		—	
Out	3.64	1.04–12.80	1.19	0.21–6.90
STD history				
No STD history	—		—	
Prior STD history	0.40 ^c	0.19–0.85	0.79	0.28–2.27
No alcohol (no sex while drunk)	—		—	
Alcohol (sex while drunk)	0.62	0.30–1.29	0.33 ^c	0.11–0.96
Depression				
No depression (CES-D <15)	—		—	
Depression (CES-D 16+)	0.48 ^c	0.22–1.01	0.32 ^c	0.11–0.92
Meeting sexual partners in past 12 months				
No public cruising area	—		—	
Public cruising area	0.32 ^d	0.13–0.79	0.30 ^c	0.10–0.98
No internet	—		—	
Internet	0.38 ^b	0.14–1.06	0.12 ^c	0.11–0.92

^aFinal multivariable logistic regression model adjusted for age, race/ethnicity, education, income, sexual identity disclosure (“outness”), HIV status, STD history, drug and alcohol use, sexual partner meeting venues, and depression.

^bApproached significance ($p < 0.10$).

^c $p < 0.05$

^d $p < 0.01$.

STD, sexually transmitted disease; CES-D, centers for epidemiologic studies depression scale.

Multivariable logistic regression model examining associations to risk reduction

In a multivariable logistic regression model adjusting for relevant demographic and behavioral covariates, the following variables were associated with a decreased odds for engaging in risk reduction behaviors: alcohol use during sex (AOR = 0.33; 95% CI = 0.11–0.96), depression (CESD score 16; AOR = 0.32; 95% CI = 0.11–0.92), and meeting sexual partners at public cruising areas (AOR = 0.30; 95% CI = 0.10–0.98) and via the Internet (AOR = 0.12; 95% CI = 0.11–0.92) in the previous 12 months. Age, education, income, sexual identity disclosure, HIV status, STD history, and drug use (crystal methamphetamine, ecstasy, marijuana, or popper use) were not significantly associated with risk reduction behaviors.

Discussion

Overall, one in five Massachusetts MSM reported having engaged in specific sexual behaviors in the prior 12 months with intent to reduce their HIV risk. Contrary to our hypotheses and prior research on drug use,^{7–10,12} abstaining from drug use during sex was not significantly associated with risk reduction among the current sample. However, MSM who did not use alcohol during sex and those who were not depressed were more likely to engage in less risky sexual behaviors, consistent with prior studies.^{10,13–15,23} These findings suggest that HIV prevention interventions with MSM would benefit from addressing “syndemics”^{24,25} associated with sexual risk taking. In particular, alcohol use, depression, and sexual risk behavior may be interacting health conditions that additively increase negative health consequences (i.e., HIV transmission) among some MSM.²⁶ HIV prevention interventions for MSM

may benefit from incorporating screening and/or treatment for alcohol use or depression, thus allowing some MSM to respond more effectively to behavioral change approaches to HIV prevention.²⁷

With respect to contextual variables, risk reducers were less likely to have met sex partners in the prior 12 months at public cruising areas and via the Internet. This finding is consistent with prior research showing that MSM frequenting specific gay venues are more likely to engage in high risk sexual behaviors^{28,29} and more often use substances during sex^{30,31} compared to those who do not. Findings from the current study suggest that in addition to addressing psychosocial issues, effective HIV prevention interventions should consider ways to engage the MSM at greatest risk for HIV acquisition and transmission in their risky environments.

The data presented here should be interpreted cautiously. First, as a cross-sectional study, data are subject to the limitations of a study design that descriptively measures exposure and disease status at the same point in time, not allowing for inferences about causality to be made. Second, this convenience sample could be confounded by possible sampling biases (e.g., recruiting a sample less representative of the population), resulting in limited generalizability. Moreover, small sample size poses a significant limitation with respect to statistical power, particularly in multivariable logistic regression analyses. Last, because approximately half of the participants were patients recruited at FCH, a community health center specializing in LGBT health care, the sample may be more gay-identified or “out” with a higher prevalence of HIV infection/STD history than the greater Boston area MSM population.

Limitations notwithstanding, the current analysis found that certain psychosocial and behavioral factors were associ-

ated with decreased sexual risk behaviors among MSM. Identifying and understanding factors associated with risk reduction behaviors may be important to consider in designing effective sexual health prevention interventions for the riskiest subpopulations of MSM.

It has been suggested that challenges of maintaining MSM's interest in prevention efforts may be exacerbated by a failure of some HIV prevention programs to update risk reduction messages.^{32,33} Understanding alternative sexual practices which MSM engage in may help to reinvigorate HIV prevention efforts aimed at making sex not only safer, but also to tailor prevention messages to help MSM feel that sex can remain exciting, gratifying, and intimate. Educating MSM about alternate, safer-sex behaviors besides condom use may normalize a range of sexual practices and desires between men that pose less HIV risk than unprotected anal sex.

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Author Disclosure Statement

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