Gender Differences in Heterosexual Anal Sex Practices Among Women and Men in Substance Abuse Treatment

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Abstract

Heterosexual anal intercourse (HAI) is an understudied risk behavior among women and men in substance abuse treatment. Rates of HAI for women ($n = 441$) and men ($n = 539$) were identified for any, main and casual partners. More men (32.8 %) than women (27.1 %) reported engaging in HAI in the previous 90 days. These rates are higher than those reported for both men (6.0–15.9 %) and women (3.5–13.0 %) ages 25–59 in the National Survey of Sexual Health and Behavior. Men were significantly more likely to report HAI with their casual partners (34.1 %) than women (16.7 %). In a logistic regression model generated to identify associations between HAI and variables previously shown to be related to high risk sexual behavior, being younger, bisexual, and White were significantly associated with HAI. For men, having more sex partners was also a significant correlate. HAI is a logical target for increased focus in HIV prevention interventions.

Keywords

Heterosexual anal intercourse; Gender differences; Sexual risk behavior; HIV prevention

Introduction

Research into HIV transmission risk has traditionally focused on high risk populations such as men who have sex with men (MSM) and injection drug users. Increasingly, however, heterosexual transmission has gained attention as it is now the second highest transmission

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category in the US, after MSM and before injection drug use. Although heterosexual transmission only accounted for 18.1 % of accumulated AIDS cases as of 2009, it accounted for 30.4 % of new AIDS diagnoses in that same year [1]. Data such as this clearly indicate that heterosexual transmission has become of paramount concern.

Because of this, HIV prevention work has also targeted heterosexual individuals [2–6]. In these efforts, prevention messages have promoted barrier methods such as condom use with a focus primarily on vaginal intercourse. Although anal intercourse (AI), especially receptive AI, is highly predictive of HIV seroconversion and is a far riskier behavior (i.e. more infectious) than vaginal intercourse [7–13], it receives scant attention in interventions targeting primarily heterosexuals. This is in sharp contrast to interventions targeting MSM (e.g. *Many Men, Many Voices* [14] and *d-up! defend yourself* [15] where the highly infectious nature of AI, especially receptive AI, receives a heavy focus. The risky nature of AI compared to vaginal intercourse is evident in a comprehensive review of HIV transmission in heterosexual couples, in which Boily et al. [7] determined that receptive anal intercourse carried a 1.7 % risk of HIV transmission, compared to vaginal intercourse which carried a 0.08 % risk for male-to-female transmission and 0.04 % female-to-male transmission.

The lack of focus on anal intercourse in prevention messages is problematic given that, based on absolute numbers, researchers calculate that more heterosexual women engage in receptive AI than do MSM. Based on national survey data and a review of the literature, Halperin [8] conservatively estimated that, among US adults, approximately 1–1.5 % of men engage in receptive AI compared to approximately 5 % of women. At the time of Halperin's publication, this translated to approximately 1 million US MSM compared to 4 million US heterosexual women who reported engaging in receptive anal intercourse, a finding that is indeed counter to public perception. It must be noted these calculations do not take into account the frequency in which MSM engage in AI compared to heterosexual women. Based on a phone survey of randomly identified California households, Erickson et al. [16] estimated the prevalence of adults who engaged monthly in heterosexual anal intercourse (HAI) to be 8 % for men and 6 % for women. A more recent national survey of adult sexual behavior suggests the rate of receptive AI among women is probably even higher [17]. Among adult men and women, being younger (<40), a time period of particularly high risk for sexually transmitted disease transmission, is positively associated with having engaged in AI in the past year [17, 18]. Rates of condom use for HAI are consistently low with 63 % of men and women age 15–39 in RESPECT-2 and 67 % of women age 12–66 in a Los Angeles HIV prevention program reporting no condom use for HAI during the time period assessed [19, 20].

Rates of reported HAI were higher in populations considered at higher sexual risk, such as women receiving HIV prevention services (21.6 % in prior 6 months) [20] or men and women being treated in sexually transmitted disease clinics (18.3 % in prior 3 months; 39.3 % in prior year) [19]. Much of the research on HAI among substance abusers has focused on methamphetamine. Consistently methamphetamine users compared to non-methamphetamine drug abusers report increased prevalence of HAI [21–24].

Overall, the literature exploring HAI concludes that it is an understudied, yet common, practice among both heterosexual women and men in the general population. HAI rates in various populations have ranged from 23 % in sexually active college students [25], 17–33 % for urban female heterosexuals with an HIV-positive partner [26], 5.5–28.8 % for heterosexual men in the general population [18], and 4–21.9 % for women in the general population [17]. Clearly, HAI is a common aspect of sexuality [27], is the riskiest for HIV transmission, and therefore demands interventions that openly recognize it as such.

Gender differences in HAI are important to examine in the context of HIV prevention, as it is inherently a higher risk behavior for women than men. In HAI, women are always the receptive partner, and HIV is more likely transmitted from the insertive to receptive partner [7, 28]. Most HIV prevention interventions not targeting MSM do not emphasize the unique risks associated with HAI. This is especially problematic for heterosexual drug users, given that they are a group with particularly high HIV transmission risk. Because of the need of HIV prevention interventions with this population, it is important to understand its prevalence of HAI. Moreover, given that gender-specific interventions are likely more effective [2, 3, 29], it is important to identify gender-specific correlates of HAI in this population.

The National Institute on Drug Abuse (NIDA) National Drug Abuse Treatment Clinical Trials Network (CTN) recently completed a pair of HIV prevention interventions targeting female and male substance users enrolled in outpatient drug treatment [2, 3]. These trials generated data from a large national sample of nearly 1000 substance users enrolled in 16 community treatment programs across the US, with a fairly equal distribution of women and men. As part of the baseline assessment, participants provided detailed information about their recent sexual behaviors, providing a unique opportunity to examine the prevalence of HAI behavior, identify correlates of this behavior, and test for potential gender differences.

Given the dearth of information on HAI among substance abusers, this study's purpose was to examine the prevalence and correlates of HAI among men and women enrolled in substance abuse treatment. We hypothesized that: (1) the prevalence of recent HAI would be higher in this sample relative to data from a nationally representative sample of US adults; (2) women would be more likely to engage in HAI with their main partner, and men more likely to engage in HAI with casual partners; and (3) HAI would be associated with the following variables previously associated with engaging in high risk sexual behavior: being male [30], younger age [31], having multiple sex partners [30], sex with a bisexual man (women only) [32], stimulant use [33–35], greater psychiatric symptoms [34–36], and history of sexual abuse [34, 36].

Methods

Participants

Randomized participants from the Real Men Are Safe [2] ($n = 539$) and Safer Sex Skills Building for Women [3] ($n = 441$) studies who reported engaging in heterosexual activities in the 90 days prior to baseline assessment formed the pool of potential participants. Eligible participants in the two studies were women and men aged 18 and older who (1) were enrolled in a participating substance abuse treatment program; (2) reported engaging in unprotected vaginal or anal intercourse during the prior 6 months; (3) were willing to be randomly assigned to one of two interventions and complete study assessments; and (4) were able to speak and understand English. Excluded were (1) participants who showed gross mental status impairment, defined as severe distractibility, incoherence or severe cognitive impairment as measured by the Mini Mental Status Exam [37, 38] or clinician assessment; (2) men who had a primary sexual partner who was intending to become pregnant, or women who were trying to become pregnant; or (3) participants who had been in methadone maintenance treatment for less than 30 days.

Measures

Sexual Behavior Inventory (SBI)/Sexual Experiences and Risk Behavior Assessment Schedule (SERBAS)—The SBI items were selected or adapted from the Sex and Drug Abuse Relationship Interview [39] and the SERBAS [40, 41]. SBI and

SERBAS items were administered using the audio computer-assisted self-interviewing (ACASI) method. ACASI methods have been shown to increase disclosure of high risk behaviors compared to face-to-face interviews [42, 43]. The SERBAS is a widely used sexual risk behavior assessment with good evidence of reliability and validity among both injection drug users and others at high risk for HIV. SBI and SERBAS items used in the current study utilized identical or very similar wording. The following sexual behavior variables, based on the 90 days preceding the baseline assessment, were generated for the current analyses: (1) having a main sexual partner identified as a spouse or fiancé/fiancée or long term lover or new lover (yes/no), (2) had one or more casual (not meeting the definition for main) partners (yes/no), (3) frequency of HAI, and (4) condom use classified as none, some (1–79 % of intercourse events) and frequent (80–100 %) for HAI with main and casual sexual partners. Condom use was dichotomized for some analyses because the majority of cases reported no condom use for HAI.

Data Analysis

Rates of engaging in HAI and using condoms for HAI were determined for any, main, and casual partners. Differences between gender, and between bisexual versus people with heterosexual only partners, were analyzed using contingency tables and χ^2 or the *Mann–Whitney U* statistic. To compare rates of condom use for anal versus vaginal intercourse within individuals, a *McNemar* test for dichotomous related measures was utilized. To compare the current sample to general population, the sample's mean 90-day HAI rates were compared to those for the age group of men [18] and women [17] with highest HAI rates in the National Survey of Sexual Health and Behavior using the *Test for Significance of a Proportion* [44].

Based on prior research, the following variables were thought to be related to high risk sexual behavior among substance abusers: sex of participant [30], age [31], psychiatric severity [34–36], lifetime history of sexual abuse [34, 36], ethnicity [31], stimulant use [30, 31, 33], number of sexual partners [30, 45] and bisexual behavior [32]. Initial analyses provided descriptive information for the sample in terms of how gender and HAI were related univariately to these and other demographic variables. A 2 (sex) by 2 (HAI) analysis examined how each of these variables differed for men and women as a function of engaging in HAI. For continuous variables, the General Linear Model (using analysis of variance–ANOVA) was utilized. The same approach was conducted for dichotomous variables but using the Generalized Linear Model. Next, multivariate analyses focused on which variables were more predictive of HAI, and whether this varied by sex. Variables were entered as predictors into a series of logistic regression analyses along with sex of participant. To determine possible interactions between sex of participant and each of the predictor variables of interest, an interaction term was added to the model one at a time. Non-significant interaction terms were removed from subsequent models. SPSS for Windows, version 18, was used to conduct all statistical analyses [46].

Results

Rates of HAI with Main and Casual Partners

Table 1 shows the percentage of men and women who engaged in any HAI in the prior 90 days, HAI with main sexual partner, and HAI with casual sexual partners. More men (32.8 %) than women (27.0 %, $\chi^2 = 3.9$, $p = 0.047$) report engaging in HAI. Not shown in the table, of those engaging in HAI in the prior 90 days, men (median = 4.0) reported more HAI events than women (median = 3.0, $U = 8,161$, $z_{estimate} = 2.79$, $p = 0.005$). Of men and women engaging in HAI in the prior 90 days, there was no difference in percent of total sexual intercourse events that were HAI (median = 16.67 men vs. 13.04 women).

As shown on Table 1, men (28.6 %) and women (23.2 %) reported similar rates of HAI with their main partners. However, men were much more likely to engage in HAI with casual partners (34.1 % vs. 16.7 %, $\chi^2 = 19.4$, $p < 0.001$). For men ($n = 65$) and women ($n = 37$) who reported having both a main and casual partner(s) and having engaged in HAI (not shown in table), men (56.9 %) were more likely to engage in HAI with both partner types than women (17.6 %, $\chi^2 = 14.0$, $p < 0.001$).

Condom Use During HAI

Also reported in Table 1 are the percent of men and women who report any condom use for HAI with main and casual partners. Men (21.9 %) were more likely to use condoms sometimes or frequently for HAI with main partners than women (9 %, $\chi^2 = 5.6$, $p < 0.018$). However, there was no gender difference in HAI condom use with casual partners. Within-person analyses comparing vaginal versus anal intercourse condom use (not tabled) showed that with casual partners, men (48.9 vs. 35.9 %, $p_{\text{McNemar}} = 0.004$) and women (64.9 vs. 29.7 %, $p_{\text{McNemar}} = 0.002$) were both more likely to use condoms for vaginal intercourse over HAI. However, with main partners, men and women did not differ in condom use for vaginal intercourse compared to HAI.

Rates of HAI in Bisexual Men and Women

The percent of men (4.3 %) and women (6.8 %) in the sample who reported sexual behavior with both sexes in the prior 90 days (labeled as bisexual for the remainder of the article) did not differ significantly. More bisexual men (52.2 %) and women (46.7 %) reported HAI in the prior 90 days than men (32.0 %, $\chi^2 = 4.07$, $p = 0.044$) and women (25.5 %, $X^2 = 6.33$, $p = 0.012$) who only engaged in sexual behavior with opposite sex partners. More bisexual women (35.7 %) reported any use of condoms for HAI than women who only reported having male sex partners (13.3 %, $\chi^2 = 4.61$, $p = 0.032$). A similar result was found for men (41.7 vs. 26.1 %), but was only statistically significant for condom use for HAI with main partners (60 vs. 20.2 %, $\chi^2 = 4.45$, $p = 0.035$).

Study Sample Compared to Normative Sample

The rates of HAI reported by this sample of men and women in substance abuse treatment are higher than the prior 90 day rates reported for highest rate age groups for both men (29.6 vs.15.9 %; age group 25–29, $z = 2.91$, $p < 0.004$), but not women (15.0 vs. 13.0 %; age group 30–39, $z = 8.81$, $p < 0.001$) in the National Survey of Sexual Health and Behavior [17, 18].

HAI and Associated Demographic Variables

Table 2 describes the sample broken down by HAI engagement and participant sex in terms of demographics plus those variables previously associated in the literature with substance abusers' HIV risk behaviors (included in the logistic regression that follows). Men and women engaging in HAI were younger and reported more days of stimulant use in the prior 30 days. There was a tendency for more white participants to report engaging in HAI than ethnic minority participants. Women reported higher ASI psychiatric composite scores than men and were more likely to report a history of physical or sexual abuse. In terms of sexual abuse, the interaction term approaching statistical significance suggests that women with such a history were the most likely (compared to men, and to women without a sexual abuse history) to engage in HAI.

In logistic regression models, only one interaction between sex of participant and another variable was statistically significant, and thus retained. Presented in Table 3 is the summary table from the final logistic regression model. Women and men who endorsed HAI were

more likely to be younger age, White and bisexual. The significant interaction term reflects that, for men but not women, having more sex partners significantly increased the likelihood of engaging in HAI. Since bisexuality was highly associated with HAI, the analysis was rerun with the bisexual participants removed to determine if their exclusion changed the findings for men and women with only opposite sex partners. The results remained consistent with the model that included bisexuality as a predictor.

Discussion

Heterosexual anal intercourse is the highest risk sexual behavior, especially for the receptive partner. This study provides data on the prevalence and correlates of HAI among men and women enrolled in outpatient addiction treatment. HAI was more prevalent among men in this substance abusing population than in a general population sample of men. Men were slightly more likely to engage in HAI than women. The prevalence of HAI in this sample of "in treatment" substance abusers was similar to rates reported for substance abusers not recruited from treatment settings [24, 47]. Men were more likely to engage in HAI with casual partners compared to women. Bisexual men and women were more likely to engage in HAI than those who only reported opposite sex partners. Tian et al. [19] reported a similar finding for men in their sample recruited from sexually transmitted disease clinics . Similar to the general population [17, 18], there is a decrease in HAI with increasing age. HAI was practiced more by Whites than ethnic minorities. Reynolds et al. [20] reported HAI was practiced by fewer African American women than White women in their sample receiving HIV prevention services.

White race, younger age and engagement in bisexual practices predicted engagement in HAI in the multivariate logistic regression model for both men and women. For men, a higher number of sex partners also predicted HAI in the logistic regression model. Although days of stimulant use was greater for both men and women who engaged in HAI than for those who did not, it did not predict HAI in the final logistic model. Similar to previous reports by Tian et al. and Reynolds et al. [19, 20] condom use for HAI was infrequent, but happened more often with casual than main partners for both men and women. More men used condoms for HAI with their main partners than women. Fewer men and women used condoms with casual partners for HAI compared to vaginal intercourse.

These findings have important implications for sexual risk prevention interventions targeting men and women in substance abuse treatment. Such interventions often teach that anal intercourse is more risky than vaginal intercourse, and receptive penetrative sex is more risky compared to insertive, using tools such as the "Safe Sex Hierarchy" in *Real Men Are Safe* [48] and the "HIV Risk Continuum Banner of Sex Behaviors" in *Nia* [5]. However, a more thorough examination of HAI is not pursued. This contrasts with interventions targeting MSM, which may include an emphasis on anal intercourse with exercises such as the "Roles and Risks for Tops & Bottoms" in *Many Men, Many Voices* [14]. Similar intervention activities for heterosexual behavior might include brainstorming about why and when people engage in HAI, the pros and cons of HAI, why people use or do not use condoms for HAI and how this might differ with vaginal sex (e.g. risk of pregnancy not present with HAI), and whether there are safer alternatives for obtaining the positive aspects of HAI that also minimize negative consequences. These discussions could be enriched with information about additional medical complications associated with anal intercourse such as anorectal sexually transmitted infections, hepatitis B, vaginal infections from anal matter when HAI precedes vaginal intercourse, and HPV-related anal cancers. As with heterosexual vaginal intercourse, men are in a position to ensure decreased sexual risk for the couple when engaging in HAI by using a condom (although the female condom is an option that provides women a relatively greater amount of control). A focus on taking responsibility for

one's health as well as one's partner's health is a common theme of interventions targeting men. The importance of taking this stance for anal as well as vaginal intercourse is clearly indicated.

Sex risk reductions targeting women in substance abuse treatment often focus on developing direct and indirect negotiation skills and strategies for convincing male partners to use a condom or engage in less risky sexual behaviors. Besides the brainstorming type exercise mentioned above, interventions targeting women may need to focus on how negotiations may be similar or different when the focus is on anal rather than vaginal intercourse.

Additional information to explain lower rates of condom use for HAI versus vaginal intercourse occasions is needed. One explanation may be that for some, HAI is used as a form of birth control. If avoiding pregnancy is the main objective, HAI may be viewed as an alternative that does not require condoms. In areas where HIV vulnerability is lower (e.g. in lower seroprevalence areas), it may be particularly important to include additional intervention material on HAI because public awareness of HIV and other sexually transmitted infections risk may not be as high.

Bisexual men and women reported more HAI, and more condom use. This makes logical sense for men, in that a common sexual practice for MSM is AI. This group may also be more informed about the inherent risks of HAI, as previously mentioned, regarding intervention targets for MSM. It is less clear why this might be the case among women who engage in sexual behavior with both sexes. Prior research has shown that individuals who are bisexual engage in a broader range of sexual practices. Some have characterized such differences in range of sexual practice via scales of erotophilia versus erotophobia [25] or via stimulation-seeking [49]. Thus bisexual women might be more likely to engage in HAI with male partners because their sexual attitudes are more open or because they are more adventuresome. By definition bisexual women and men were non-monogamous, whereas many of the heterosexual only men and women were monogamous. Although one could argue the finding for the relationship between being bisexual and engaging in HAI might be an artifact of having multiple partners, bisexual status remains independently associated with HAI even when number of sex partners is entered into the logistic model.

Some limitations to this study are worth noting. First, self-report data should always be viewed cautiously. In this study, sexual behavior data were gathered via the ACASI method. While respondents have been shown to disclose more about participating in high risk behaviors with ACASI compared to face-to-face interviews, and thus ACASI seemed the most prudent data-gathering choice, we nevertheless have no objective measure against which to check data accuracy. Participants' memory, possible misinterpretation of questions, or other factors may also have affected their reports of HAI. Second, because this was a secondary analysis, our data did not include the reasons why men and women in our sample chose to engage in HAI. This hinders the use of this information for enhancing existing HIV prevention interventions with material that is relevant to women and/or men in substance abuse treatment; we are as-yet unclear about what these reasons may be, and whether they are different for women versus men. Third, also because this was a secondary analysis, there may have been other variables that our original studies did not assess that are integral to the rates and correlates of HAI in treatment-seeking substance abusers. Finally, it is worth noting that the study population was treatment-seeking, and our results may not generalize to substances abusers not in treatment.

In conclusion, our data show that more substance abuse treatment-seeking women and men participate in HAI than in the general population and condom use is low for both women and men. Given that heterosexual transmission is a primary means of contracting HIV and

the seroconversion risk is greatest for receptive AI, it is vital that any HIV prevention program include material on HAI. Future studies could significantly contribute to intervention development by exploring the reasons why substance abusers engage in HAI. A clearer understanding of what influences their decisions (pleasure, novelty, birth control, power differential, risk, fear, sex-for-drugs, poor negotiation skills, etc.) could give researchers and clinicians useful information in motivating and supporting behavior change.

Acknowledgments

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Table 1

Percent of men and women participants from the NIDA CTN Safe Sex for Men/Women clinical trials reporting condom use during heterosexual anal sex (HAI) in 90 days prior to baseline

Any HAI	Men (n = 539) n (%)	Women (n = 441) n (%)	χ^2	p
Sexual partners				
All	177 (32.8)	119 (27.0)	3.94	0.047
Main (♂, n = 416; ♀, n = 328)	119 (28.6)	76 (23.2)	2.80	0.094
Casual (♂, n = 279; ♀, n = 227)	95 (34.1)	38 (16.7)	19.36	< 0.001
Condom use for HAI				
All sex partners				
None	129 (72.9)	101 (84.2)	5.21^a	0.022
Some (1–79 %)	18 (10.2)	7 (5.8)		
Frequent (> 79 %)	30 (16.9)	12 (10)		
Main sex partners				
None	93 (78.2)	71 (93.0)	5.60^a	0.018
Some (1–79 %)	7 (5.9)	2 (2.6)		
Frequent (> 79 %)	19 (16.0)	5 (6.4)		
Casual sex partners				
None	62 (65.3)	26 (68.4)	0.12^a	0.728
Some (1–79 %)	14 (14.7)	2 (5.3)		
Frequent (> 79 %)	19 (20)	10 (26.3)		

[a] Due to small *n* "some condom use" and "frequent condom use" categories collapsed for the contingency table analyses

Table 2

Variables previously associated with sexual risk behavior as a function of HAI and sex of participant

	Any HAI		No HAI		General Linear Model (ANOVA)		
	Men (n = 177)[a] M (SD)	Women (n = 119)[a] M (SD)	Men (n = 362)[a] M (SD)	Women (n = 322)[a] M (SD)	F_{sex}	F_{HAI}	$F_{sex \times HAI}$
Age	40.00 (10.69)	39.13 (8.97)	37.02 (9.69)	37.08 (7.98)	0.94	**19.38*****	0.61
Education	12.79 (2.27)	12.36 (2.17)	13.00 (2.21)	12.67 (2.32)	2.23	0.19	0.12
No. of sex partners	1.80 (1.43)	4.07 (28.37)	3.28 (3.67)	3.03 (4.40)	0.71	2.21	3.53
ASI psychiatric	0.23 (0.23)	0.30 (0.24)	0.27 (0.25)	0.34 (0.25)	**12.09*****	1.31	0.95
Days stimulant use (30 days)	2.37 (5.34)	2.20 (5.65)	2.90 (6.82)	3.45 (7.31)	0.20	**4.30***	0.72

	Men n (%)	Women n (%)	Men n (%)	Women n (%)	Generalized Linear Model		
					Wald χ^2_{sex}	Wald χ^2_{HAI}	Wald $\chi^2_{sex \times HAI}$
Ethnicity[a]							
Non-Hisp White	168 (45.3)	193 (54.2)	104 (53.1)	89 (72.4)			
Non-Hisp Black	112 (30.2)	98 (27.5)	37 (18.9)	22 (17.9)			
Hispanic	59 (15.9)	33 (9.3)	36 (18.4)	8 (6.5)			
Asian/PI/Haw	6 (1.6)	3 (0.9)	2 (1.0)	0			
Native Am/AK Native	26 (7.0)	29 (8.1)	17 (8.7)	4 (3.3)	**6.59****	**3.20**#	1.01
Primary Drug of Abuse[b]							
Alcohol	46 (13.4)	15 (4.7)	11 (6.2)	7 (5.9)			
Opioids	56 (16.3)	78 (24.6)	24 (13.6)	22 (18.5)			
Cocaine	43 (12.5)	70 (22.1)	17 (9.6)	22 (18.5)			
Methamphetamine	13 (3.8)	0 (0)	15 (8.5)	1 (0.8)			
Sedative/Cannabis	15 (4.4)	10 (3.2)	11 (6.2)	5 (4.2)			
Polydrug with alcohol	74 (21.6)	63 (19.9)	45 (25.4)	35 (29.4)			
Polydrug, no alcohol	79 (23.0)	66 (20.8)	47 (26.5)	25 (21.0)			
None	17 (5.0)	15 (4.7)	7 (4.0)	2 (1.6)			
Treatment modality							
Methadone	167 (48.7)	174 (54.2)	87 (50.3)	58 (48.7)			
Psychosocial	176 (51.3)	147 (45.8)	86 (49.7)	61 (51.3)	0.41	0.39	0.84

	n (%)	n (%)	n (%)	n (%)	Generalized Linear Model		
					Wald χ^2_{sex}	Wald χ^2_{HAI}	Wald $\chi^2_{sex \times HAI}$
Physical abuse (lifetime)							
Yes	104 (30.4)	227 (70.7)	53 (29.9)	89 (74.8)			
No	238 (69.6)	94 (29.3)	124 (70.1)	30 (26.2)	**127.69*****	0.08	1.01
Sexual abuse (lifetime)							
Yes	53 (15.5)	181 (56.4)	27 (15.3)	80 (67.2)			
No	289 (84.5)	140 (43.6)	150 (84.7)	39 (32.8)	**157.72*****	0.67	**3.57**#
Bisexual behavior (90 days)							
Yes	11 (3.2)	16 (5.0)	12 (6.8)	14 (11.8)			
No	332 (96.8)	305 (95.0)	165 (93.2)	105 (88.2)	1.80	**3.07**#	0.04

Statistically significant values were in bold. Percentages shown for each variable are the column percents

\# $p < 0.10$;

* $p < 0.05$;

** $p < 0.01$;

*** $p < 0.001$

[a] The sample size for some variables is slightly reduced due to missing data

[b] Ethnicity was dichotomized to White/minority for analysis

[c] No analyses performed; data provided for descriptive purposes

Table 3

Logistic regression summary of variables associated with heterosexual anal intercourse

Variables in final equation	Odds ratio	Wald	p	95 % CI lower	95 % CI upper
Sex of participant	0.86	0.54	0.463	0.57	1.29
Age	**0.98**	**9.01**	**0.003**	**0.96**	**0.99**
Bisexual (yes)	**1.91**	**4.31**	**0.038**	**1.04**	**3.53**
Ethnic minority (no)	**1.53**	**7.00**	**0.008**	**1.12**	**2.10**
No. of sexual partners	1.00	0.27	0.603	0.98	1.01
Days stimulant use (30 days)	1.02	2.36	0.119	1.0	1.04
ASI psychiatric composite	1.57	1.91	0.167	0.83	2.99
Physical abuse (lifetime)	0.84	0.96	0.341	0.58	1.21
Sexual abuse (lifetime)	1.23	1.10	0.294	0.84	1.82
Sexual partners by sex	**1.29**	**23.24**	**<0.001**	**1.16**	**1.43**

Statistically significant values were in bold