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AIDS OR HIV EDUCATION AND SEXUAL BEHAVIORS AMONG ADOLESCENT SEXUAL MINORITY MALES: NATIONAL HIV BEHAVIORAL SURVEILLANCE, 3 U.S. CITIES, 2015

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Abstract

In the U.S., HIV transmission rates have increased among male-male sexual contacts. Sex education reduces HIV-related risks; yet impacts for adolescent sexual minority males (ASMM) are less known. Data from a sample ($n = 556$) of ASMM (aged 13–18) in three U.S. cities were used to examine associations between HIV education in school and sexual behaviors. Outcomes of interest included: sexually transmitted infection (STI), multiple sex partners, and condomless anal intercourse (CAI) with a male (all past 12 months). Adjusted prevalence ratios (aPR) and 95% confidence intervals (CI) were calculated. Of 556 ASMM, 84% reported received HIV education. Among sexually active ASMM ($n = 440$) who received HIV education, fewer reported an STI (10% vs. 21%, aPR: 0.45, CI [0.26, 0.76]) and CAI (48% vs. 64%, aPR: 0.71, CI [0.58, 0.87]) than ASMM who did not receive HIV education. Protective effects of school HIV education on sexual behaviors are promising and suggest prevention education is vital to reducing HIV- and STI-related risks among ASMM.

Keywords

HIV prevention; AIDS; HIV; sexual health education; sexual minority; adolescent

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Sexual and gender minority youth (SGMY) experience increased sexual risk and adverse health outcomes compared with their heterosexual and cisgender peers (Centers for Disease Control and Prevention [CDC], 2020). In 2018, 92% of incident human immunodeficiency virus (HIV) infections among young men (aged 13–24) were attributed to male-to-male sexual contact (CDC, 2021c). This risk demonstrates disproportionately high HIV burden among adolescent sexual minority males (ASMM) who engage in same-sex sexual behaviors (CDC, 2021b). With the continued high prevalence of HIV-related sexual and other risk behaviors among SGMY (CDC, 2020; Garofalo et al., 2016; Halkitis et al., 2013; Kann et al., 2016), ASMM remain a priority population for public health intervention to promote protective sexual behaviors and reduce HIV burden and risk.

Given their access to large groups of young people, including ASMM, schools are a critical setting for primary prevention and health interventions across key adolescent developmental stages (Kann et al., 2016). Schools also have existing infrastructure to support HIV and STI (sexually transmitted infection) prevention efforts through classroom-based health education and connections to sexual health services (Rasberry et al., 2018). Studies suggest school-based sexual health education effectively reduces HIV-related risk behaviors among youth, including delaying age of first sex, reducing the number of sexual partners, and increasing condom use (Chin et al., 2012; Kirby, 2008; Mueller et al., 2008). HIV and STI prevention programs are specifically associated with early treatment of STIs, access to confidential and voluntary STI counseling and testing, and reduction in other risk behaviors including substance use (Bauermeister et al., 2015; Blake et al., 2001; Chin et al., 2012; Ma et al., 2014). Despite robust evidence of effectiveness of school-based HIV and STI education, the majority of programs are designed for and evaluated among general student populations, and may lack tailored and inclusive content needed to support ASMM (Pampati et al., 2020).

A recent systematic review examining perspectives and acceptability of, and outcomes related to sexual health education among SGMY, concluded that tailored sexual health interventions—most of which have intended effects on sexuality-related behaviors, knowledge, or self-efficacy and a focus on HIV prevention—were not delivered through schools (Pampati et al., 2020). Furthermore, existing evidence-informed HIV prevention interventions for young men who have sex with men use older samples of young adults (< 18), are not designed for ASMM, and are primarily delivered through community-based organizations (Williams et al., 2021). Given the gaps specific to ASMM and HIV prevention education in schools, we used data from the Centers for Disease Control and Prevention’s National HIV Behavioral Surveillance Among Young Men Who Have Sex With Men (NHBS-YMSM) system to examine associations between receipt of school-based AIDS or HIV education and ASMM’s self-report of clinical characteristics in the past 12 months, including reported STIs and sexual behaviors (i.e., condomless anal intercourse and multiple sex partners).

METHODS

PARTICIPANTS

Young men aged 13 to 18 years were recruited and interviewed for NHBS-YMSM within three metropolitan statistical areas (MSA): Chicago, Illinois; New York City, New York; and

Philadelphia, Pennsylvania. MSA eligibility for NHBS-YMSM was limited to the 20 state or local health departments funded for NHBS (<https://www.cdc.gov/hiv/statistics/systems/nhbs/index.html>). Supplemental funding for NHBS-YMSM was awarded to applicants in order of HIV prevalence. For more information about MSA selection, please see the NHBS-YMSM protocol (https://www.cdc.gov/hiv/pdf/statistics/systems/nhbs/NHBS-YMSM_Protocol.pdf).

ASMM were eligible for the study if they met the following criteria: (1) 13–18 years old; (2) assigned male sex at birth and identified as male (cisgender); (3) reported any sexual contact with another male, self-identified as gay or bisexual, or indicated same-sex attraction; (4) a resident of the MSA in which they were recruited; and (5) ability to complete the survey in English. Eligibility for the study was assessed in-person and trained interviewers reviewed informed consent/assent information with eligible participants. Participants were recruited using a combination of venue-based time-space sampling, respondent-driven sampling, and Facebook sampling. Sampling and recruitment methods have been described in more detail previously (Balaji et al., 2018; Robbins et al., 2020).

Waivers of parental consent for participants under 18 years of age were obtained by each site for varying age groups (Chicago, ages 16–17; New York City, ages 13–17; Philadelphia, ages 14–17). All consenting/assenting participants were administered an anonymous survey with a trained interviewer and offered an anonymous HIV test regardless of self-reported HIV status. Participants were compensated \$25 for survey participation and \$25 for HIV testing. HIV-positive participants were referred to HIV care and treatment. All NHBS-YMSM activities were approved by local institutional reviews boards in each city and by CDC.

MEASURES

Sociodemographics.—Participants reported demographic characteristics including age, race/ethnicity, sexual identity, grade level, and city. Participants were asked if they considered themselves to be Hispanic or Latino with a subsequent item about racial group(s) identification. Participants were able to select more than one race category and responses were re-coded to create: Hispanic/Latino, non-Hispanic Black, non-Hispanic White, and Other/Multiple race, inclusive of Asian, American Indian or Alaskan Native, or multiple races. Sexual identity was measured by one item: “Do you consider yourself to be: Homosexual or ‘Gay’; Bisexual; or Heterosexual or ‘Straight’?” Current grade level was assessed for participants who reported being enrolled in school at the time of the interview. Response options included: less than grade 6; each grade 6 through 12; technical/vocational school; GED program; college; or graduate school. Participants not enrolled in school at time of the interview were asked about whether they planned to return to school for the next semester or quarter.

AIDS or HIV Education in School.—Exposure to AIDS or HIV education in school was assessed by one item: “Have you ever been taught about AIDS or HIV infection in school?” Response options included “Yes,” “No,” “Don’t know,” or “Refuse to answer.” “Don’t know” or “Refuse to answer” responses were considered missing values and excluded from regression analyses.

Clinical Characteristics and Sexual Behaviors.—ASMM’s report of clinical characteristics included: HIV status (“HIV positive,” which included participants with a confirmed NHBS HIV-positive test result, “HIV negative,” and “No valid HIV test,” which included participants who did not consent to HIV test or had an indeterminate test result); HIV tested in past 12 months (yes or no); and sexually transmitted infection including reported diagnosis of gonorrhea, chlamydia, syphilis, or any other sexually transmitted disease in past 12 months (yes or no). Sexual behaviors in the past 12 months included: currently sexually active, defined as having at least one sex partner, male or female (yes or no); multiple sex partners, defined as having oral, anal, or vaginal sex with four or more partners, male or female (1–3 versus 4); and condomless anal intercourse (CAI), defined as having anal intercourse without using a condom with one or more male partners (yes or no).

STATISTICAL ANALYSIS

Data from across the three cities were combined and analyzed as a convenience sample. Analyses were restricted to eligible participants who consented to and completed the survey, and who were enrolled in school at the time of the data collection. Participants unenrolled and who had no plans to return to school following designated breaks (e.g., summer or winter break) were excluded from analyses ($n = 13$). The final total sample size was 556. We calculated descriptive statistics of demographics, clinical characteristics, and sexual behaviors. Wald chi-squared statistics were used to examine bivariate associations between ever receiving AIDS or HIV education in school and select demographics. In cases of small cell sizes, Fisher’s exact test was used to examine bivariate associations. Log-linked Multivariable Poisson regression was used to estimate adjusted prevalence ratios (aPRs) and 95% confidence intervals (CI) of clinical characteristics and sexual behaviors by exposure to AIDS or HIV education in school among sexually active ASMM ($n = 440$) controlling for age, race/ethnicity, and city. Statistical tests were considered significant if $p < .05$. Statistical analyses were conducted using SAS 9.4.

RESULTS

A total of 556 eligible participants completed a valid interview; 15% were aged 13–15 and 85% were aged 16–18. In total, 39% were Hispanic/Latino, 40% were non-Hispanic Black, 16% were non-Hispanic White, and 5% were Other/Multiple races (Table 1). Sixty-four percent of ASMM identified as homosexual or gay, 34% as bisexual, and 3% as heterosexual or straight. At the time of the interview, 8% of ASMM were in grade 9 or lower, 15% in grade 10, 25% in grade 11, 29% in grade 12, and 24% were enrolled in a GED program, technical or vocational school, or college. The majority of ASMM resided in Chicago (41%) and New York City (40%), with fewer in Philadelphia (19%). Seventy-nine percent of ASMM reported being sexually active in the past year. Lastly, among all ASMM in the sample, 84% ($n = 467$) reported receiving AIDS or HIV education in school.

Among clinical characteristics and sexual behaviors assessed for sexually active ASMM ($n = 440$), 5% had an HIV-positive NHBS test result, 87% were HIV negative, and 8% did not have a valid HIV test result. In the past 12 months, more sexually active ASMM reported being HIV tested (53% compared to 47%) and 12% were diagnosed with syphilis,

chlamydia, gonorrhea, or some other STI. Forty-two percent of sexually active ASMM had multiple sex partners and 51% reported CAI with a male partner.

Fewer ASMM aged 13–15 years had received AIDS or HIV education than ASMM aged 16–18 years (79% vs. 85%) (Table 2). Significant differences in exposures to AIDS or HIV education in school by race/ethnicity and sexual identity were observed. Eighty percent of non-Hispanic Black ASMM, 84% of Hispanic/Latino, 89% of Other/Multiple race and 93% of non-Hispanic White, had received AIDS or HIV education in school ($p = .016$). The majority of ASMM identifying as homosexual or gay (81%) reported receiving AIDS or HIV education in school, however significantly more ASMM identifying as bisexual (89%) or heterosexual or straight (88%) had received AIDS or HIV education in school ($p = .044$). ASMM in older grades (i.e., 11th or 12th) and those in a GED program, technical or vocation school, or college, reported greater prevalence of receiving AIDS or HIV education in school compared to ASMM in grades 10 or lower ($p = .119$).

Table 3 presents results from multivariable Poisson regression models exploring the relationships between clinical characteristics and sexual behaviors of ASMM with their exposure to AIDS or HIV education in school. All models were limited to sexually active ASMM ($n = 440$) and adjusted for age, race/ethnicity, and city. Sexually active ASMM who received AIDS or HIV education in school were less likely to report an STI in the last year than ASMM who did not receive AIDS or HIV education (9.6% vs. 20.8%, aPR: 0.45, 95% CI [0.26, 0.76]). Similarly, ASMM who received AIDS or HIV education in school were less likely to report CAI with a male sex partner in the past 12 months than ASMM who did not receive AIDS or HIV education in school (48.1% vs. 63.6%, aPR: 0.71, 95% CI [0.58, 0.87]). There was no significant effect of receiving AIDS or HIV education on reports of having multiple sex partners in the past year among ASMM (43.8% vs. 35.1%, aPR: 1.24, 95% CI [0.90, 1.73]).

DISCUSSION

This study found AIDS or HIV education in school was protective against receiving an STI diagnosis and having CAI with a male sex partner among ASMM. ASMM who received AIDS or HIV education in school reported less STIs and less CAI in the past year compared with ASMM who did not receive AIDS or HIV education in school. Our findings suggest that exposure to AIDS or HIV education in school settings is associated with reduced sexual risk behaviors among this adolescent population. These findings complement the broader literature on positive effects of educational interventions, including HIV prevention and sexual health education, on sexual behaviors among general adolescent populations (Chin et al., 2012; Denford et al., 2017; Goldfarb & Lieberman, 2020; Ma et al., 2014) and specifically, SGMY (Pampati et al., 2020) and ASMM (Rasberry et al., 2018).

In this study, 84% of ASMM reported receiving AIDS or HIV education in school with a higher proportion of 16–18-year-olds (85%) compared with younger peers (13–15-year-olds, 79%)—a trend seen in other data surveilling students' experiences with schools' provision of sexual health content in secondary grades (CDC, 2017; Lindberg & Kantor, 2021; Lindberg et al., 2016). Effective HIV education in schools requires content and skills be

introduced early in students' learning trajectories, reinforced across grade levels by trained and supported educators, and delivered equitably to all students. Teaching about HIV during earlier adolescence, for instance before age 13, may be critical for ASMM populations as male students report higher prevalence of first sexual intercourse before age 13 than female students (Lindberg et al., 2019).

Providing access to and delivering HIV education in schools that reach all students, especially racial/ethnic minorities, must remain a priority (Evans et al., 2020; Vanderberg et al., 2016). As part of this analysis, we examined differences in exposure to AIDS or HIV education by race/ethnicity and found a larger proportion of non-Hispanic White ASMM (93%) reported being taught about AIDS or HIV compared with Other/Multiple race ASMM (89%), Hispanic/Latino ASMM (84%), and Black ASMM (80%). Research documents higher proportions of Black adolescent and adult males engaging in early sexual intercourse compared with other racial/ethnic groups (Crepaz et al., 2009; Lindberg et al., 2019), while other studies report Black men are also less likely than White men to report receiving formal contraceptive education before the age of 18 years (Farkas et al., 2015). Racial/ethnic minority MSM are significantly more likely than White MSM to report a younger age of first oral or anal sex with a man, which may help contextualize racial/ethnic disparities in HIV acquisition and suggests a need for MSM-inclusive sexual health education for SGMY (Sanchez et al., 2020).

This study found a lower prevalence of STI diagnoses and CAI in the past year among sexually active ASMM who were taught about AIDS or HIV in school compared to those who did not receive such education. Considering increasing rates of STI among adolescents in the United States (CDC, 2021d) and urgent public health priorities to mitigate HIV and STI risks for adolescents at disproportionate risk (CDC, 2021a, 2021b), this finding supports the importance and impacts of prevention education delivered through schools. However, studies reporting effects of school-based sexual health programs specifically on HIV and STI incidence and testing among adolescents are scant. A 2018 systematic review and meta-analysis of school-based primary prevention on adolescents' (ages 10–19) incidence and testing for HIV and STI (Mirzazadeh et al., 2018) found no studies assessing HIV incidence, and only one non-RCT intervention (Hawkins et al., 2008; Hill et al., 2014) that produced reductions in STI incidence into adulthood (Mirzazadeh et al., 2018). No studies in that 2018 review included interventions tailored for or delivered to SGMY or ASMM. Future research should address how school-based HIV education can impact a broad set of sexual behaviors specifically among ASMM (Pampati et al., 2020).

Moreover, prevalence of CAI in the past year was lower among sexually active ASMM who received AIDS or HIV education than those without in this study. Findings from a national randomized trial examining interventions to reduce HIV acquisition among young males (18 years) complement our findings (Schnall et al., 2022). Specifically, use of an HIV prevention mobile health intervention (i.e., MyPEEPS Mobile) among same-sex attracted young males (ages 13 to 18 years) was efficacious in reducing the number of condomless anal sex contacts between treatment and control adolescents at 3-month follow-up (Schnall et al., 2022). Additional research is needed to examine the impacts of innovative methods for delivering AIDS or HIV education and behavioral interventions, including curriculum or

technology-based, on adolescent sexual risk and protective factors related to HIV and STI acquisition.

Expanded access to comprehensive HIV prevention in schools is important, given documented impacts on sexual behaviors (Chin et al., 2012; Kirby, 2008; Ma et al., 2014), and the considerable variations in state laws or local policies influencing sexual health instructional time and content (CDC, 2017; Guttmacher Institute, 2021; Lindberg et al., 2016). ASMM residing in states recruited for this study, Illinois (IL), New York (NY), and Pennsylvania (PA), may have experienced differences in the AIDS or HIV education received in school. In all three states, provision of HIV education is mandated and requires content be age appropriate (Guttmacher Institute, 2021); however, only IL requires HIV education be medically accurate and information on condoms be provided. In NY and PA, only information about condoms must be provided as part of HIV education (Guttmacher Institute, 2021). These differences in laws and policies may have affected local school-level implementation, including the timing, content, and quality of HIV prevention education, as well as level of inclusivity and tailoring needed for SGMY or ASMM populations (Guttmacher Institute, 2021; Hall et al., 2016; Lindberg et al., 2016). Considerable shifts in the national landscape of sexual health education, including policies, funding, and program foci, as well as fragmented implementation at the school-level may hinder progress towards public health objectives to address HIV and STI burden and risk among adolescents (Department of Health and Human Services, 2021).

School-based HIV and STI prevention education which is comprehensive, medically accurate, and developmentally and culturally inclusive can be effective at promoting healthy sexual development and addressing risk behaviors (Kirby et al., 2011). Well-planned and implemented sexual health education can result in increased knowledge about sex, the development of life skills related to sex (e.g., self-efficacy to refuse sex and obtain condoms), and positive attitudes required to change behaviors (e.g., attitudes regarding pressuring someone to have sex; Kirby et al., 2011). While specific HIV-related content and skills (e.g., condom use demonstrations) were not assessed in this study, previous research cites associations between school-based condom education and both fewer reports of STI diagnoses and a greater likelihood of STI testing among sexually active males (Dodge et al., 2009); suggesting condom instruction is vital to educational curricula and programming. Addressing HIV prevention through sexual risk reduction strategies, like accessing and using condoms (Widman et al., 2014) or negotiating condom use between sex partners (Tschann et al., 2010) specifically among ASMM, is supported by findings in this study and warrant future investigations and consideration as core skill-building components to school-based HIV education.

Study findings should be viewed in light of several limitations. The study used a convenience sample from three cities and may not be generalizable to all ASMM aged 13–18 years. The analysis used a cross-sectional sample so causality cannot be inferred from the results. Data were self-reported and may be subject to social desirability bias or recall error. This study was unable to fully explore AIDS or HIV education and sexual risk by race/ethnicity due to small sample sizes. Lastly, the analysis did not investigate the content, duration, or quality of the AIDS or HIV education received by participants. Further research

should explore the scope and sequence of HIV education and protective effects for ASMM sexual health.

AIDS or HIV education in school was associated with fewer STI diagnoses and CAI in our sample of ASMM, and findings highlighted discrepancies in receipt of AIDS or HIV education in school based on grade and race/ethnicity. Considering increased risk for HIV and STIs among younger adolescent and racial/ethnic minority ASMM compared with their older adolescent, White peers (CDC, 2021a), access to comprehensive, medically accurate, and developmentally and culturally inclusive AIDS or HIV education is critical. Although 39 U.S. states and the District of Columbia mandate HIV education, instructional content and timing in school-level implementation remains variable, impacting receipt of necessary and protective prevention education to address HIV, STI, and related health risks for ASMM.

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TABLE 1.

Demographic, Clinical, and Behavioral Characteristics of Adolescent Sexual Minority Males: National HIV Behavioral Surveillance Among Young Men Who Have Sex With Men, 3 U.S. Cities, 2015

Characteristic	<i>n</i>	%
<i>Overall</i>	556	100.0
Age group (years)		
13–15	81	14.6
16–18	475	85.4
Race/ethnicity		
Hispanic/Latino ^a	218	39.3
Non-Hispanic Black	220	39.6
Non-Hispanic White	91	16.4
Other/Multiple race ^b	26	4.7
Sexual identity		
Homosexual or “Gay”	350	63.6
Bisexual	184	33.5
Heterosexual or “Straight”	16	2.9
Current school grade ^c		
9th grade or less ^d	45	8.1
10th grade	83	15.0
11th grade	136	24.5
12th grade	158	28.5
GED program/Technical or vocational school/College	133	24.0
City		
Chicago, Illinois	229	41.2
New York City, New York	224	40.3
Philadelphia, Pennsylvania	103	18.5
Sexually active, past 12 months ^e		
Yes	440	79.3
No	115	20.7
Having been taught AIDS or HIV education in school		
Yes	467	84.0
No	89	16.0
<i>Clinical characteristics^f</i>		
HIV status		
HIV positive	22	5.0
HIV negative	382	86.8
No valid HIV test result ^g	36	8.2
HIV tested, past 12 months		
Yes	234	53.4
No	204	46.6

Characteristic	<i>n</i>	%
Sexually transmitted infection, past 12 months ^h		
Yes	51	11.6
No	389	88.4
<i>Sexual behaviors^f</i>		
Multiple sex partners, past 12 months ⁱ		
Yes	186	42.3
No	254	57.7
CAI with a male sex partner, past 12 months		
Yes	223	50.8
No	216	49.2

Note. Due to rounding, percentages may not add to 100; sample sizes may vary slightly due to missing data for variables presented in the table. GED = General Education Diploma; CAI = condomless anal intercourse.

^aHispanic/Latino can be of any race

^bCategory is composed of Asian (57.7%), American Indian/Alaskan Native (11.5%), and multiple races (30.8%)

^cFor participants who were on a winter or spring break at the time of the interview, current school grade includes the grade they were returning to after break

^dIncludes participants who reported being in grades 7 to 9

^eDefined as having at least one male or female sexual partner in the 12 months prior to the survey

^fDenominator includes only sexually active participants

^gIncludes participants who did not consent to HIV test or had an indeterminate test result

^hParticipants who reported being diagnosed with syphilis, chlamydia, gonorrhea, or some other sexually transmitted infection

ⁱParticipants who reported four or more male or female partners were classified as having multiple sex partners.

TABLE 2.

Bivariate Analysis of Receiving AIDS or HIV Education in School Among Adolescent Sexual Minority Males: National HIV Behavioral Surveillance Among Young Men Who Have Sex With Men, 3 U.S. Cities, 2015

	Having been taught AIDS or HIV in school		
	<i>n</i>	%	χ^2^a
	467	84.0	
Age group (years)			0.186
13–15	64	79.0	
16–18	403	84.8	
Race/ethnicity			0.016 ^b
Hispanic/Latino ^c	183	83.9	
Non-Hispanic Black	175	79.6	
Non-Hispanic White	85	93.4	
Other/Multiple races ^d	23	88.5	
Sexual Identity			0.044 ^e
Homosexual or “Gay”	284	81.1	
Bisexual	164	89.1	
Heterosexual or “Straight”	14	87.5	
Current school grade^e			0.119
9th grade or less ^f	33	73.3	
10th grade	66	79.5	
11th grade	117	86.0	
12th grade	139	88.0	
GED program/Technical or vocational school/College	111	83.5	

Note. Due to rounding, percentages may not add to 100; sample sizes may vary slightly due to missing data for variables presented in the table. GED = General Education Diploma.

^a *p* values calculated from Wald chi-squared analysis

^b Due to small cell sizes, Fisher’s exact was used to calculate *p* values in place of Wald chi-square analysis

^c Hispanic/Latino can be any race

^d Category is composed of Asian (57.7%), American Indian/Alaskan Native (11.5%), and multiple races (30.8%)

^e For participants who were on a winter or spring break at the time of the interview, current school grade includes the grade they were returning to after break

^f Includes participants who reported being in grades 7 to 9.

TABLE 3.

Multivariable Poisson Regression Analysis Between Receiving AIDS or HIV Education in School and Clinical Characteristic and Sexual Behaviors in the Past 12 Months Among Sexually Active Adolescent Sexual Minority Males ($N=440$): National HIV Behavioral Surveillance Among Young Men Who Have Sex With Men, 3 U.S. Cities, 2015

AIDS or HIV education in school	Sexually transmitted infection ^a				Had multiple sex partners ^b				CAI with a male partner			
	<i>n</i>	Prev.	aPR ^c	95% CI	<i>n</i>	Prev.	aPR ^c	95% CI	<i>n</i>	Prev.	aPR ^c	95% CI
Yes	35	9.6	0.45	[0.26, 0.76]	159	43.8	1.24	[0.90, 1.73]	174	48.1	0.71	[0.58, 0.87]
No	16	20.8		REF	27	35.1		REF	49	63.6		REF

Note. Modeling was restricted to participants who reported having anal or oral sex in the past 12 months.

^aParticipants who reported being diagnosed with syphilis, chlamydia, gonorrhea, or some other sexually transmitted infection in the past 12 months

^bParticipants who reported four or more male or female partners were classified as having multiple sex partners in the past 12 months

^cModels adjusted for age, race/ethnicity, and U.S. city.