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Sex Drugs, Peer Connections, and HIV: Use and Risk Among African-American, Latino, and Multiracial Young Men Who Have Sex with Men in Los Angeles and New York

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Sex Drugs, Peer Connections, and HIV: Use and Risk Among African-American, Latino, and Multiracial Young Men Who Have Sex with Men in Los Angeles and New York

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*African-American and Latino young men who have sex with men (YMSM) are at high risk for HIV infection. We administered brief intercept surveys (*N = *416) at 18 black and Latino gay pride events in Los Angeles and New York in 2006 and 2007. Ordinal logistic regressions were used to model the effects of substance use during sex, peer connectedness, relationship status, and homelessness on condom use. Alcohol use, crystal use, homelessness, and having a primary relationship partner were negatively associated with condom use, while peer connectedness and marijuana use during sex*

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were positively associated with condom use. Implications for service providers and future research are discussed.

KEYWORDS HIV, sexual risk, condom use, substance use, sex drugs, young MSM, peer connectedness, homelessness, relationship status, African-American, Latino, multiracial

INTRODUCTION

Young adults represent one-third of new HIV infections in the United States of America (Hall, 2008). More than half of these new infections are among young men who have sex with men (YMSM), ages 13 to 29 years. As with adult MSM, African-American and Latino YMSM are disproportionately infected with HIV (Centers for Disease Control [CDC], 2007; Koblin et al., 2000) and these disparities are increasing (CDC, 2009). These trends are also evident in Los Angeles County (HIV Epidemiology Program, Los Angeles County Department of Public Health, 2008) and in New York City (New York City Department of Health and Mental Hygiene, 2010). Young Men's Survey data collected between 1994 and 1998 from 15- to 22-year-old MSM showed that 14% of African-Americans and 7% of Latinos were HIV positive, compared with 3% of White young MSM (MacKellar, Valleroy, Karon, Lemp, & Janssen, 1996). In the second phase of the Young Men's Survey (1998–2000) among 23- to 29-year-olds, racial/ethnic disparities in HIV prevalence persisted, with 32% of African-Americans, 14% of Latinos, and 7% of Whites testing HIV positive (Valleroy et al., 2000).

Use of methamphetamine and other substances is prevalent among YMSM (Salomon et al., 2009; Thiede et al., 2003) and is associated with unprotected sex in YMSM populations in general (Clatts, Goldsamt, Neaigus, & Welle, 2003; Greenwood et al., 2001; Harawa et al., 2004; McNall & Remafedi, 1999; Rusch, Lampinen, Schilder, & Hogg, 2004; Stueve, O'Donnell, Duran, San Doval, & Geier, 2002; Waldo, McFarland, Katz, MacKellar, & Valleroy, 2000). In an analysis of the Young Men's Survey data conducted by Celentano and colleagues (2006), YMSM in seven major U.S. cities reported using multiple substances during sex in the past six months, including alcohol (43%), marijuana (28%), amphetamines (9%), cocaine (9%), and poppers (8%). To date, very few recent studies of African-American or Latino YMSM focus attention on factors that may be related to condom use for these two specific racial/ethnic populations (Agronick et al., 2004; Bingham et al., 2003). Research on substance use and sexual risk among African-American or Latino YMSM is particularly scarce. Therefore, understanding current trends related to substance use and sexual behaviors specifically among African-American and Latino YMSM remains an important research agenda item.

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Despite higher estimates of HIV prevalence among African-American and Latino YMSM, the prevalence of unprotected anal sex does not seem to vary substantially by race/ethnicity (Valleroy et al., 2000). Furthermore, some evidence shows that African-American MSM do not report higher rates of substance use compared with White MSM (Harawa et al., 2004; Millett, Flores, Peterson, & Bakeman, 2007). A number of recent studies have reported on the growing national problem of methamphetamine use and unprotected sex among adult MSM (Colfax et al., 2005; Nanin & Parsons, 2006). However, scholars have documented variations in substance use patterns by race/ethnicity, sexual identity, and geography (Irwin & Morgenstern, 2005; Thiede et al., 2003). Diaz and colleagues (Diaz, Heckert, & Sanchez, 2005) also discuss specific motivations for stimulant use among some Latino MSM. Since substance use patterns and sexual risk behaviors may be different for African-American and Latino YMSM compared with other YMSM, targeted social services, including HIV prevention and substance abuse treatment programs, may need to reflect these differences as well. Since their HIV prevention needs may be unique, our study examines substance use and sexual risk behaviors among African-American and Latino YMSM.

One goal of this study was to focus on the contexts in which unprotected sex and substance use occur in the lives of African-American and Latino YMSM. Like other researchers on substance use and HIV risk behaviors (Pollock and Halkitis, 2009), we believe it is important to examine not just the individual-level factors that place individuals at risk for HIV infection, but also contextual factors that may increase HIV risk. Since we examined contextual factors such as relationship status and housing status found to be robustly associated with non-condom use in the literature, we draw on the ecological framework (Bronfenbrenner, 1979) as a theoretical foundation for our study.

In addition, our study was informed by preliminary research with the study population. For instance, primary themes emerging from this study's formative research included a sense that, despite public health warnings to the contrary, crystal methamphetamine was not the only important substance use issue mentioned by focus group participants and their peers. Also, African-American and Latino YMSM reported that the sense of peer connections and other contextual factors were critical to explore. Based on these preliminary data, we focused our study on understanding substance use patterns among African-American and Latino YMSM and how contextual factors such as peer connection, relationship status, and homelessness might also influence their sexual risk behaviors. This is important to explore because, if such contextual factors affect substance use or sexual behavior, then addressing them in programs and services for YMSM might also be key to reducing risk in these populations.

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The construct of peer connectedness as a contextual factor in this study was also informed by ideas in sociological theory. For instance, Shibutani (1986) has argued that individuals who feel rejected from society may experience social dislocations, reacting with drastic or self-defeating behaviors. Alternatively, individuals with strong peer reference groups may refer to them to define social norms and values supporting protective behaviors such as safer sex. Research on community involvement and attachment among MSM supports the idea that peer reference groups may have both a positive and negative influence on gay youths. For instance, previous studies have found that greater involvement in the community may dampen the negative effects of poverty, racism, and homophobia on safer-sex practices among MSM through the production of positive self-identity and safer-sex norms among social networks (Ramirez-Valles, 2002) and through the moderation of the effects of experiencing racism and homophobia on substance use and risky sexual behavior (Ramirez-Valles, Kuhns, Campbell, & Diaz, 2010). Greater involvement in gay communities and attachment to an ethnic community, as well as supportive peer norms, have been observed to be protective against unsafe sex behaviors among Latino and African-American MSM and YMSM (Easton, Iverson, Cribbin, Wilson, & Weiss, 2007; Hart & Peterson, 2004; Mutchler, 2000; O'Donnell et al., 2002; Ramirez-Valles, Zimmerman, & Newcomb, 1998). However, connection to the gay community may not always provide a supportive environment that reduces risk behavior. Some research has found positive association between involvement in gay community and unprotected sex among YMSM (Hays, Kegeles, & Coates, 1997), suggesting that more involvement in some aspects of gay communities may provide more opportunities for YMSM to meet sexual partners and engage in unprotected sexual activities. Therefore, it may be important to better understand the effects of peer connectedness on sexual risk behaviors among African-American and Latino YMSM in specific community contexts.

Another key contextual factor for understanding sexual risk and substance use in YMSM is relationship status. Relationship status is highly correlated with unprotected sex among YMSM (Davidovich, de Wit, & Stroebe, 2000; Dudley, Scales Rostosky, Korfhage, & Zimmerman, 2004; Hays et al., 1997; Rusch et al., 2004). Specifically, partner type (e.g., primary versus casual) plays an important role for YMSM. Primary partners may perceive unprotected anal intercourse as a symbol of trust and, therefore, may be less likely to use condoms (Davidovich et al., 2004). Yet, YMSM may be at risk of HIV acquisition if they assume that their primary partners are HIV negative or monogamous without engaging in conversations geared toward negotiated safety.

Finally, homelessness, substance use, and sexual risk behaviors are interconnected among YMSM in New York and Los Angeles (Clatts, Goldsamt, Yi, & Gwadz, 2005; Kipke et al., 2007). Compared with their heterosexual

peers, YMSM are disproportionately represented among the homeless youths in large urban centers in the United States such as New York, Los Angeles, and Miami (Clatts, Goldsamt, Yi, & Gwadz, 2005; Kipke et al., 2007). We included homelessness in our analyses to estimate its potential effect on condom use in our sample.

Our study was guided by two specific aims: (1) to describe substance use and sexual risk behaviors among young African-American and Latino gay and bisexual men attending gay pride events in Los Angeles and New York, and (2) to examine associations between substance use and condom use behaviors while taking into account the effects of contextual factors including peer connectedness, relationship status, and homelessness. We hypothesized that African-American and Latino YMSM who used substances during sex would be less likely to protect themselves by using condoms. We also hypothesized that African-American and Latino YMSM who felt closer to their peers would be more likely to protect themselves by using condoms.

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METHODS

Participant Selection

We collected data from 18- to 24-year-old African-American and Latino YMSM in New York and Los Angeles. Participants ($N = 416$) were recruited for the brief, cross-sectional survey at 18 African-American and Latino lesbian, gay, bisexual, transgender, and/or queer (LGBTQ)–identified pride events throughout the 2006 and 2007 pride season in Los Angeles and New York. In Los Angeles, gay pride events included specific events for black pride and also for Latino pride; in New York, events also were specifically targeted for black and Latino participants, but they were also geared toward even more specific groups, such as Puerto Rican participants. We selected pride events for recruitment because attendees tend to represent a diverse cross-section of gay and bisexual men that is different from those recruited from other public venues (Battle, Cohen, Warren, Fergerson, & Audam, 2002), such as gay-oriented bars and dance clubs. This method of recruitment was used to reduce the potential for selection bias that might exist at other gay venues such as bars and dance clubs, where it is expected that many attendees consume alcohol (Bauer & Welles, 2001). Furthermore, agencies providing programs for gay and bisexual youths often advertise services and conduct outreach at gay pride events, indicating the probable relevance of findings from this sample to participants in these types of social service programs.

Participants were sampled from the pride events using a modified venue-based sampling method commonly used in other studies recruiting hard-to-reach populations such as young gay men (Kubicek et al., 2007; Wong, Kipke, & Weiss, 2008). The modified venue-based sampling scheme (MacKellar, Valleroy, Karon, Lemp, & Janssen, 1996; Muhib et al., 2001) used

to obtain a probability sample of men who attend these events in the participating cities included the following: (1) two-hour time slots were randomly selected from a frame of potential sampling times and venues; (2) participant recruitment and interview locations were randomly selected from a pool of all possible entrance, exit, and crossway sites at each venue; and (3) interviewers then approached every second person broadly appearing of eligible age and ethnicity. This strategy allowed the study team to sample participants entering the events at different points and at different times during the event, thereby increasing the likelihood that potential participants all had the same probability of being invited to participate in the study.

Potential participants were screened for sex, sexual orientation, age, and race/ethnicity. Young men who self-identified as "gay," "bisexual," or "other" were eligible to participate, as were African-American, Latino/Hispanic, and biracial or multiracial YMSM who identified as African-American or Latino. Eligible participants completed an anonymous, interviewer-administered, pen-and-paper screener and survey in private or semi-private one-on-one settings at the event in order to maximize confidentiality. Approximately 65% of those who were eligible agreed to participate in the study. Participants received two movie passes (roughly $20 value) as reimbursement for their time. The study protocol was approved by the AIDS Project Los Angeles (APLA) Institutional Review Board.

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Measures

APLA and Gay Men's Health Crisis (GMHC) conducted formative research with members of the target group to inform the quantitative survey questions and the study's specific aims. We pilot tested the survey items with members of the target group to assess face validity. Our study focused on measuring how peer connections, partner variables, and other contextual factors, such as homelessness and substance use during sex, may be related to condom use.

Socio-Demographic Characteristics

The survey included items for race/ethnicity, age, sexual orientation, income, education, HIV status, relationship status, and homelessness experienced in the past six months. Homelessness was defined as "having to stay with friends, on the street, in a shelter, car, or abandoned building" at any point during this period.

Substance Use

Data for lifetime substance use and recent substance use during sex were collected for the following substances: alcohol, cocaine, crack, metham-

phetamine, ecstasy (MDMA), GHB (gamma-hydroxybutyrate), heroin, marijuana, poppers (nitrites/inhalants), special K (ketamine), Viagra, and any other drugs the participant was currently using or had previously used. We used modified items from the Addiction Severity Index (ASI) to determine the frequency of alcohol and substance use during sex in the past three months; content validity has been well-established for the ASI (McLellan et al., 1985). All items were interviewer administered. YMSM who had ever used a given substance were asked if they had used that substance in the past three months immediately before or during sex. Frequency of substance use during sex in the past three months was measured using a Likert scale ranging from 0 ("Never") to 5 ("Daily"). Since few YMSM reported high frequency of use, this scale was collapsed into a binary indicator of any use during sex in the past three months.

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Peer Connectedness

Peer connectedness was measured using the single item "How connected do you feel to other young black (Latino) gay (bisexual) men like you?" This question was asked according to the participants' race/ethnic and sexual identification, substituting their race/ethnicity and sexual identification based on each participant's response to the demographic questions. Responses ranged from 1 ("Not at all") to 4 ("Very"). We engaged in extensive formative work with members of the target population to develop the most useful way to measure peer connectedness since African-American and Latino YMSM felt that it was important to measure how connected they felt to their peers rather than how connected they felt to sexual or racial/ethnic communities.

Condom Use

Frequency of condom use during anal sex ("In the past three months, how often did you use a condom when having anal sex?") was measured using the response categories 0 ("No sex"), 1 ("Never"), 2 ("Some of the time"), 3 ("About half the time"), 4 ("Most of the time"), and 5 ("All of the time/Always"). The outcome variable was collapsed into three ordered categories and reverse coded for analyses: 1 ("Always"), 2 ("Sometimes"), and 3 ("Never"). Those who did not report anal sex in the past three months ($N = 53$, 16% of the overall sample) and those who declined to report on sexual activities ($N = 1$) were excluded from the analytical sample. The "sometimes" category was used to reflect inconsistent condom use among the participants.

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Statistical Analyses

Data analyses were performed with the STATA statistical package Version 10 (StataCorp, 2007). Descriptive statistics were generated for all socio-demographic, substance use, peer connectedness, and sexual behavior variables overall, by city, and by race/ethnicity. Bivariate tests of the distributions of categorical variables across condom use, city, and race/ethnicity were conducted using two-way chi-square statistics. Bivariate tests of the distributions of continuous variables, such as age and frequency of substance use during sex, across condom use, city, and race/ethnicity were conducted using a *t*-test or an ANOVA with Bonferroni adjustment. For multivariate modeling, variables were selected based on theoretical importance, relevant literature, and statistical significance in bivariate ordinal logistic regression. Since our outcome variable (frequency of condom use during anal sex) is measured by ordered categories (1 ["Always"], 2 ["Sometimes"], and 3 ["Never"]), we used a generalized ordered logit model; however, since one independent variable (relationship status) did not meet the proportional odds assumption of ordinal regressions, we used a partial proportional odds estimation that allowed the effect of this variable to vary across outcome categories (gologit2 in STATA) (Brant, 1990; Fu, 1999; Long & Freese, 2006; Williams, 2006). The model presented below shows estimates of the effects of using particular substances during sex on participants' odds of condom use in the past three months, holding constant other factors known to affect condom use—peer connectedness, relationship status, and homelessness.

RESULTS

Background Characteristics

Table 1 presents socio-demographic characteristics of survey participants by city and by race/ethnicity. Overall, participants largely identified as gay (74%) or bisexual (22%) and had at least a high school education. Eligibility was restricted to YMSM identifying as Black/African-American (40%) or Latino/Hispanic (47%). A substantial portion of YMSM identified as biracial or multiracial (13%), with at least one of their identities being a target population. The average age of participants was 20.7 years. About 3.4% self-reported that they were HIV positive. While a majority of YMSM felt very (41%) or somewhat (31%) connected to their peers, a substantial group felt only a little connected (19%) or not at all connected (10%) to their peers. African-American YMSM felt less connected to their peers than multiracial YMSM ($\chi^2 = 9.97$, $p = .028$). A few notable differences existed across city in sample compositions that were identified with chi-square tests for categorical variables and independent sample *t*-tests for continuous variables. Specifically, a lower proportion of participants in New York had attended college compared with participants in Los Angeles ($\chi^2 = 22.91$ $p = .000$).

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TABLE 1 Percentage Distribution of Socio-Demographic Characteristics of the Sample of African-American, Latino, and Multiracial YMSM, by City and Race/Ethnicity ($N = 416$)

		City			Race/Ethnicity			
	Overall	New York ($N = 176$)	Los Angeles ($N = 240$)	p-value	African-Am ($N = 167$)	Latino ($N = 196$)	Multiracial ($N = 53$)	p-value
Male	100							
City								
New York	42							
Los Angeles	58							
Race/Ethnicity				0.014				
African-American	40	48	34					
Latino	47	40	52					
Bi/Multiracial	13	11	14					
Sexual Orientation				0.165				0.103
Gay	74	71	77		72	85	67	
Bisexual	22	27	19		26	13	27	
Other	4	3	4		3	2	6	
Age (mean, in years)	20.7	20.6	20.8	0.213	21.0	20.5	20.6	0.057
HIV Status				0.751				0.059
Positive	3.4	4.0	2.9		5.4	2.6	0.0	
Negative	92.0	92.0	92.1		92.8	91.3	92.5	
Unknown	4.6	4.0	5.0		1.8	6.2	7.5	
Homeless, past 6 mo.	8.3	8.0	8.5	0.840	6.7	8.8	11.3	0.527
Education				0.000				0.338
11th grade or less	4	5	4		4	5	3	
High school, GED	31	42	23		33	31	36	
Some college	48	38	56		43	48	42	
College degree	13	13	13		15	15	12	
Graduate degree	2	1	3		4	1	0	
Other, vocational	1	0	2		1	0	6	

The ethnic composition of the sample also varied by city ($\chi^2 = 8.47$, $p = .014$).

Substance Use

YMSM in the study reported previous use of a variety of substances in their lifetimes, including alcohol (86%), marijuana (57%), ecstasy (18%), cocaine (12%), crystal methamphetamine (11%), and poppers (11%). Self-reports of lifetime substance use generally did not vary for particular substances by city, with the exception of alcohol (90% Los Angeles, 82% New York; $\chi^2 = 5.18$, $p = .023$), crystal methamphetamine (17% Los Angeles, 2% New York; $\chi^2 = 22.24$, $p = .000$), and cocaine (14% Los Angeles, 8% New York; $\chi^2 = 3.84$, $p = .050$), all of which were higher in Los Angeles compared with New York. Similarly, few differences in lifetime use patterns were found across race/ethnicity, with the exception of crystal methamphetamine use ($\chi^2 = 14.70$, $p = 001$) which was more prevalent among Latino (16%) and multiracial (13%) YMSM compared with African-American YMSM (4%).

YMSM reported using a variety of substances immediately before or during sex (see Table 2), with alcohol (58%) and marijuana (30%) use during sex being the most prevalent. The use of a few substances during sex varied by city: specifically, the use of alcohol ($\chi^2 = 4.57$, $p = .033$) and methamphetamine ($\chi^2 = 8.53$, $p = .003$) during sex was more prevalent in Los Angeles compared with New York. Use of substances during sex was similar across African-American, Latino, and multiracial YMSM with the exception of poppers ($\chi^2 = 6.19$, $p = .045$): Latino YMSM were more likely to use poppers during sex than multiracial YMSM. We found no statistically significant differences in substance use during sex when comparing Latinos in Los Angeles with Latinos in New York or when comparing African-Americans in Los Angeles with African-Americans in New York (data not shown).

Determinants of Condom Use Frequency

Overall, 66% report always using condoms during anal sex in the past three months, compared with 22% who used condoms sometimes, and 10% who never used them. Table 3 presents unadjusted and adjusted odds ratios from the generalized ordered logit model with 95% confidence intervals obtained using robust standard errors adjusted for the clustering of observations by sampling city. This model indicates that several factors are predictive of inconsistent and non-condom use among these YMSM. In the adjusted model, YMSM surveyed in Los Angeles were 22% less likely than YMSM surveyed in New York to report inconsistent and non-condom use versus always using condoms (OR = 0.78; CI = 0.78–0.79). While additional factors such as age, race/ethnicity, and sexual orientation are not associated with the frequency

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TABLE 2 Percentage Distribution of Any Substance Use Immediately Before or During Sex in the Past Three Months, by City and Race/Ethnicity ($N = 338$)[a]

		City			Race/Ethnicity[b]			
Substance	Overall	New York ($N = 144$)	Los Angeles ($N = 194$)	p-value	African-Am ($N = 141$)	Latino ($N = 154$)	Multiracial ($N = 43$)	p-value
Alcohol	58	51	63	0.033	56	61	54	0.496
Cocaine	2	1	3	0.128	1	3	2	0.767
Crack	< 1	0	1	0.388	1	0	0	0.496
Crystal	3	0	6	0.003	1	5	2	0.169
Ecstasy	5	6	5	0.529	4	6	7	0.732
GHB	0	0	0	—	0	0	0	—
Heroin	1	1	1	0.832	1	0	0	0.245
Marijuana	30	35	26	0.067	30	27	37	0.410
Poppers	6	5	7	0.478	4[ab]	9[a]	0[b]	0.045
Special K	1	0	1	0.222	1	1	0	0.862
Viagra	2	2	2	0.712	2	1	2	0.829
Other	1	1	1		1	2	0	

Note: Participants who reported no sex during the past three months are not included in this table.

[a,b]Race/Ethnicity categories that do not have superscript letters in common are significantly different from each other at $p < .05$.

TABLE 3 Unadjusted and Adjusted Odds Ratios for Determinants of Inconsistent and Non-Condom Use Compared to Consistent Condom Use Among YMSM of Color ($N = 290$)

	Unadjusted Odds		Adjusted Odds	
Independent variables	OR	95% CI	OR	95% CI
City				
New York (reference)	1.00	1.00		
Los Angeles	0.89	0.88–0.90***	0.78	0.78–79***
Age (years)	0.96	0.85–1.09	0.96	0.78–1.17
Race/Ethnicity				
African-American (reference)	1.00		1.00	
Latino	1.26	0.90–1.77†	1.27	0.98–1.63†
Multiracial	1.03	0.73–1.37	1.04	0.53–2.05
Sexual Orientation				
Gay (reference)	1.00		1.00	
Bisexual	0.82	0.73–0.92**	0.86	0.60–1.25
Relationship Status				
Single (reference)	1.00		1.00	
Partnered—cut1[a]	1.59	0.93–2.58†	1.72	0.87–3.42
Partnered—cut2[b]	3.92	2.56–6.00***	4.21	3.10–5.71***
Homeless	1.95	1.59–2.39***	1.97	1.88–2.06***
Peer Connectednes				
Not at all (reference)	1.00		1.00	
A little connected	0.67	0.47–0.97*	0.73	0.70–0.75***
Somewhat connected	0.72	0.42–1.23	0.77	0.52–1.13
Very connected	0.58	0.46–0.72***	0.60	0.53–0.68***
Substance Use During Sex				
Alcohol	1.64	1.25–2.16***	1.88	1.73–2.05***
Mathamphetamine	2.09	1.93–2.27***	3.01	2.56–3.54***
Ecstasy	1.18	0.77–1.82	1.58	1.27–1.97***
Marijuana	1.02	1.01–1.03***	0.78	0.69–0.89***
Poppers	0.79	0.39–1.61	0.51	0.39–0.66***

Note: † $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

[a]Partnered 1 contrasts outcome condom use categories 1 (Always) versus 2 (Sometimes) and 3 (Never).

[b]Partnered 2 contrasts outcome condom use categories 1 (Always) and 2 (Sometimes) versus 3 (Never).

of condom use during anal sex among participants in the adjusted model, the effect of peer connectedness was associated with condom use frequency. YMSM who reported being "very" connected (OR = 0.60; CI = 0.53–0.68) and "a little" connected (OR = 0.73; CI = 0.70–0.75) to their peers had significantly lower odds of inconsistent and non-condom use during anal sex compared with participants who reported being "not at all" connected to their peers.

Whereas peer connectedness had a protective effect for YMSM, recent experiences of homelessness increased the likelihood of not always using condoms: YMSM who reported being homeless in the past three months were nearly two times more likely than YMSM who did not experience recent homelessness to report inconsistent or non-condom use compared with consistent condom use (OR = 1.97; CI = 1.88–2.06).

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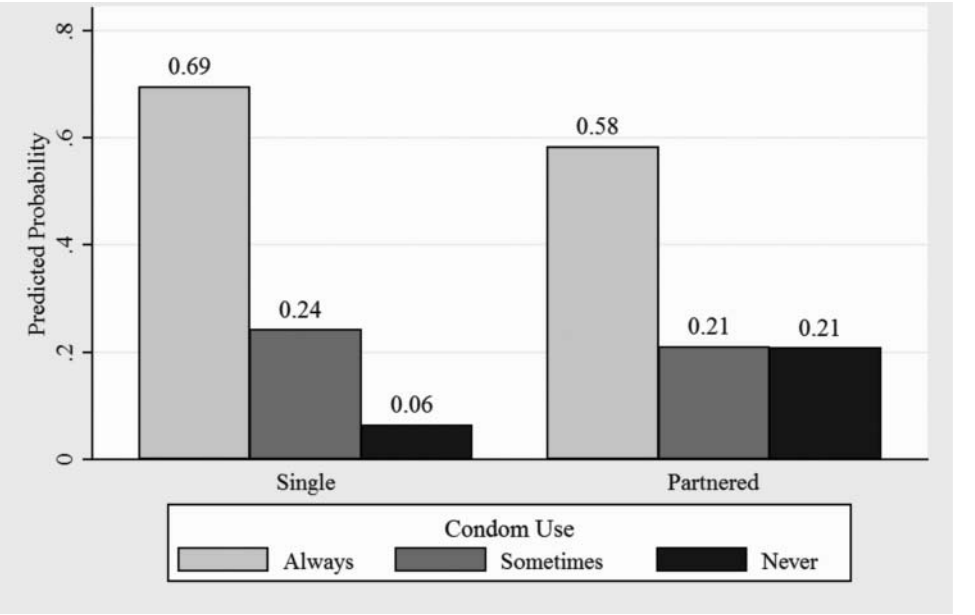

FIGURE 1 Predicted probability of condom use by relationship status.

Next, we considered the effects of relationship status on condom use frequency among YMSM. In this model, relationship status did not meet the parallel odds assumption of ordinal logistic regressions. Thus, we used an estimation technique that allowed the parameter for relationship status to vary across outcome categories. In Table 3, Partnered—cut1 represents the parameter estimated to contrast condom use category 1 ("Always") against categories 2 ("Sometimes") and category 3 ("Never") while Partnered—cut 2 contrasts condom use categories 1 ("Always") and 2 ("Sometimes") against category 3 ("Never"). Partnered—cut1 is nonsignificant and indicates that YMSM who reported being single and YMSM who reported having a partner were equally likely to report "Always" using condoms compared with "Sometimes" and "Never" (OR = 1.72; CI = 0.87–3.42). However, when "Never" using condoms is contrasted with "Sometimes" and "Always" (Partnered—cut2) we see that YMSM who reported that they had a partner were 4.2 times more likely than single YMSM to report "Never" using condoms (OR = 4.21; CI = 3.10–5.71). Thus, YMSM with partners had higher odds than single YMSM of never using condoms. This relationship is shown in Figure 1, which presents the predicted probabilities from the estimated model of condom use across relationship status.

Last, Table 3 shows the odds ratios associated with the use of specific substances during sex. YMSM who used alcohol or crystal methamphetamine before or during sex were roughly 2 and 3 times more likely to inconsistently and never use condoms during anal sex, respectively (alcohol: OR = 1.88,

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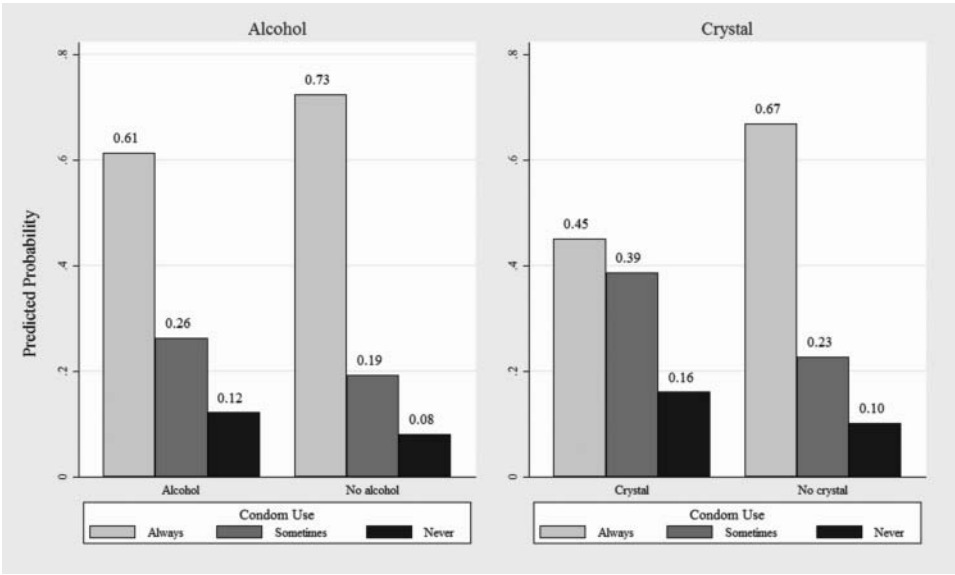

FIGURE 2 Predicted probability of condom use by substance use during sex, last 3 months.

CI = 1.73–2.05; crystal methamphetamine: OR = 3.01, CI = 2.56–3.54). YMSM who used ecstasy before or during sex were roughly one and a half times more likely to inconsistently and never use condoms during anal sex in the past three months (OR = 1.58; CI = 1.27–1.97). In contrast, YMSM who reported using marijuana or poppers before or during sex were found to be 22% and 49% less likely to inconsistently and never use condoms compared with those who did not use marijuana or poppers during sex, respectively (marijuana: OR = 0.78, CI = 0.69–0.89; poppers: OR = 0.51, CI = 0.39–0.66). Figure 2 presents the predicted probabilities from the estimated model of condom use for alcohol and crystal use during sex. Here, we see the increase in predicted probabilities of inconsistent and non-condom use as well as a decrease in the predicted probability of always using condoms for YMSM who have used alcohol or crystal methamphetamine during sex in the past 3 months compared to YMSM who have not.

DISCUSSION

The first aim of this study was to investigate substance use patterns and associations with condom use frequency among YMSM, specifically focusing on the under-researched substance use patterns of African-American and Latino YMSM. Overall, the results highlight the wide range of substances African-American and Latino YMSM have been exposed to and have recently used during sex. The most prevalent substances reported by YMSM during

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sex were alcohol and marijuana, although participants also reported use of ecstasy, cocaine, poppers, and methamphetamine. Use of alcohol, methamphetamine, marijuana, and poppers during sex is associated with condom use frequency for African-American and Latino YMSM. In particular, alcohol use was associated with higher odds of inconsistent and non-condom use during sex. Alcohol use before or during sex in the past three months was quite high (58%) and may be overlooked as a risk factor for HIV among YMSM because it is more socially acceptable than use of stimulants or club drugs. Our findings on methamphetamine use support a large number of studies that have found a relationship between HIV risk behaviors and methamphetamine use during sex. African-American and Latino YMSM using methamphetamine during sex may be at greater risk for HIV infection than non-users due to higher odds of both inconsistent and non-condom use. These findings therefore support a focus on prevention of alcohol and methamphetamine use as strategies to help reduce HIV infection rates among African-American and Latino YMSM. While public health strategies and social service providers have recently emphasized the risks of crystal methamphetamine, increased attention to how alcohol use during sex impacts condom use may also be warranted as a component of interventions and counseling services for this population.

Not all of the substances used before or during sex were associated with higher odds of inconsistent and non-condom use during sex for our study participants. Use of marijuana and use of poppers before or during sex in the past three months were associated with lower odds of inconsistent and non-condom use during sex in the past three months. Other studies have found no relationship between marijuana use and condom use among young adults (Graves & Leigh, 1995), and differential situational effects of marijuana use (Rusch et al.,2004), but we found no other literature reporting a protective effect of marijuana use before or during sex for African-American or Latino YMSM. The effects of marijuana use on sexual drive are both dose-dependent and sex-dependent (Gorzalka & Hill, 2006); therefore, the relationship between marijuana and condom use may also vary by dose and across individuals. Similarly, we found no other study with a negative association of popper use and unprotected intercourse among African-American or Latino YMSM. Another study of MSM living with HIV found popper use to be associated with unprotected sex among an older sample (mean age of 37); these authors speculated that the norms for older MSM may be related to a specific cohort effect, and therefore the use of poppers and other substances may be different among YMSM who are not living with HIV (Purcell, Parson, Halkitis, Mizuno, & Woods, 2001). These speculative ideas should be further explored.

A second aim of this study was to examine the associations of contextual factors identified by participants in formative work with frequency of condom use, drawing on ecological theories of risk (Bronfenbrenner, 1979).

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Consistent with the assumptions in this theoretical framework that contextual factors may influence risk behaviors, we found that contextual factors such as peer connectedness, relationship status, and recent homelessness were also associated with condom use frequency among African-American and Latino YMSM. The protective effect of peer connectedness for condom use among YMSM attending pride events provides further evidence in support of previous studies that documented positive health associations between community involvement, peer connectedness, and peer norms (Detrie & Lease, 2008; Hart & Peterson, 2004; O'Donnell et al., 2002; Ramirez-Valles, 2002; Ramirez-Valles et al., 2010). This finding suggests the importance of addressing social networks and peer-based HIV prevention programs for African-American and Latino YMSM attending gay pride events. Of course, peer connectedness may be more likely to have a protective effect where YMSM are integrated into networks with stronger norms for safer-sex practices, while those with stronger norms for risky sexual and substance use behaviors may actually increase risk behavior through habituation of risk behaviors (Hays et al., 1997; Rhodes, 1997). Thus, providing services that help young gay and bisexual men access social networks that are supportive of HIV prevention may be key to reducing risk in this population.

The YMSM in our study were encountered at LGBT-identified and race-specific events and, therefore, feelings of peer connectedness and their associated effects among these YMSM may be related to safer-sex norms associated with service delivery and peer education provided by LGBT organizations at these events. This suggests that building on these social systems by providing culturally tailored sexual health programming, particularly at racial/ethnic-specific LGBT-identified pride events, may be useful. As suggested by earlier work focused on African-American YMSM (Kraft, Beeker, Stokes, & Peterson, 2000), changing social norms to increase social support for YMSM in African-American communities may also be achieved by working with community leaders and creating more opportunities for dialogue about sexuality and HIV issues in African-American communities in order to address cultural issues such as sexual stigma and racism that may influence sexual risk behaviors. Other cultural factors found to be related to sexual risk behaviors among young African-American and Latino men (Munoz-LaBoy et al., 2006) should be considered, in addition to the contextual factors we addressed, in future research with African-American and Latino YMSM.

Homelessness has been identified as a strong determinant of non-condom use among MSM in previous research (Clatts, Goldsamt, & Yi, 2005; Clatts, Goldsamt, Yi, & Gwadz, 2005; Warren et al., 2008). In the present study, 8% of YMSM reported recent homelessness. As with prior studies (Clatts, Goldsamt, Yi, & Gwadz, 2005), homelessness among YMSM was found to be a risk factor for YMSM over and above other factors controlled for in the regression models. YMSM who reported recent homelessness had twice the odds of inconsistent or never-use of condoms compared with their

stably housed peers. The significant impact that homelessness appears to have on HIV risk further underscores the importance of housing support services and family supportiveness for Latino and African-American gay and bisexual young men.

Partner type and relationship status variables have also been identified as key factors in predicting non-condom use among MSM in previous research (Adams, Sears, & Schellenberg, 2000; Diaz & Ayala, 1999; Worth, Reid, & McMillan, 2002). While unprotected anal intercourse between uninfected monogamous partners is not risky sexual behavior for HIV transmission, gay and bisexual men (and others) who negotiate non-condom use with primary partners are still potentially at risk for HIV infection if partners are not exclusive (Doll et al., 1994). We found that relationship status was associated with non-condom use for YMSM in this study, with those in primary partnerships having four times greater odds of never using condoms compared with single YMSM. Approximately one-fourth (23%) of the participants reported having a primary partner. The association between having a primary partner and engaging in unprotected sex remains true for African-American and Latino YMSM; other research has shown a correlation between long-term relationship status and unprotected sex among African-American YMSM (Warren et al., 2008).

Focusing on condom use with primary and casual partners remains an important issue for this population since many YMSM may not know the HIV status of their sexual partners. In a study of gay men in the Netherlands who seroconverted between 1984 and 2000, Davidovich and colleagues (Davidovich, de Wit, & Stroebe, 2000) reported that younger gay men are much more likely to have been infected by a primary partner than a casual partner. Gay and bisexual men may initiate non-condom use with primary partners to demonstrate love and trust or because they use other cues to intuit their partner's HIV status (Adams et al., 2000). This may happen quite early in a relationship: in a study of gay men ages 18 to 34, 55% of those having unprotected anal intercourse with primary partners initiated non-condom use within the first 3 months of the relationship (Davidovich et al., 2004), a time period when HIV antibodies may not yet be detectable in persons newly infected with HIV by standard routine tests (Petersen et al., 1994). Gay and bisexual young men should be supported in enhancing their ability to discuss condom use within primary partner relationships, and counseled that such relationships are not a risk-free context.

We should consider certain limitations when interpreting these data. The data are self-reported, retrospective accounts of stigmatized and, in some cases, illegal behaviors. These data were collected via interviewer-administered questionnaires in semi-private areas of public events; efforts to maximize confidentiality were made by removing the participant from the public crossways and from groups of friends. Still, participants may have provided responses they perceived to be more socially desirable, and this

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may have resulted in underestimating substance use or non-condom use behaviors. However, reported levels of non-condom use were similar to other studies with this population (Dudley et al.,2004; Valleroy et al., 2000). Furthermore, the level of detail of information collected from participants was limited by the functional lengths of administering brief intercept surveys in public-event venues.

The sample consisted of YMSM who racially or sexually self-identify to the extent that they would participate in a racially or sexually identified pride event. Therefore, we may not generalize the findings outside of the study population: African-American and Latino YMSM attending racial/ethnic-specific LGBT pride events in Los Angeles and New York. Individuals who are very "closeted" choose not to attend such events, or are hard to reach (such as those who are institutionalized) were not included in this sample, and their experiences of sex-drug use and related issues may vary from those reported by individuals in our sample. Although we did not find many significant differences in substances used during sex that were associated with non-condom use among our study participants by race/ethnicity, we did find differences by city. Further research is needed to explore these possible variations within the racial/ethnic groups.

The experiences of African-American and Latino YMSM in different geographic regions may also explain the variations we found by city. Looking at geographic differences, the National Survey on Drug Use and Health (NSDUH) (Substance Abuse and Mental Health Services Administration, 2010), for instance, found that current illicit drug use and alcohol use was similar in the West compared to the Northeast, but somewhat lower in the South and Midwest. Also, the NSDUH found that the rate of current illicit drug use and alcohol use was higher in metropolitan areas than in nonmetropolitan areas. Our data, though focused on substance use *during sex*, is consistent with some of the findings from the NSDUH (i.e., that rates of most illicit substance use during sex were similar among participants in our study between Los Angeles and New York). However, since the NSDUH found differences between metropolitan areas and nonmetropolitan areas as well as some geographic regions, it is possible that studies of young African-American and Latino gay men's substance use during sex may be similarly lower in those regions compared to what we found in large metropolitan areas such as Los Angeles and New York, due to the potential influences of differing geographic regions. Consistent with the NSDUH data on young adults, we found relatively little crystal use reported among YMSM compared to alcohol and marijuana use, but like other studies of YMSM (Thiede et al., 2003; Celentano et al., 2005), we found higher crystal use in Los Angeles compared to New York; we also found higher crystal use *during sex* in Los Angeles compared to New York. We found a higher rate of alcohol use during sex in Los Angeles compared to New York; this is consistent with results from a study that also measured alcohol use during sex among YMSM

(Celentano et al., 2005). This finding could also be due to the particular venues from which we sampled. Nevertheless, it is still important to further address the issues of substance and alcohol use during sex among African-American and Latino YMSM in different regions and venues.

While it is very difficult to obtain a representative sample of a population such as gay youths who are difficult to define and reach with probabilistic sampling techniques, we believe that our sample represents an important contribution to the numerous studies recruiting primarily at gay bars and clubs, since such sampling procedures represent a selection bias toward alcohol use. Venue-based sampling strategies were used to approximate a representative sample of participants attending targeted venues (Kipke et al., 2007). Consistent with similar studies conducted at gay pride events (Bauer & Welles, 2001), our sampling strategy was developed to increase the representativeness as much as possible of the study population in the respective geographic areas. We targeted African-American and Latino gay pride events for recruitment because pride attendees tend to represent a diverse cross-section of African-American and Latino gay and bisexual men, and they provide opportunities to culturally tailor HIV prevention efforts by building on strengths and resiliencies that exist within YMSM communities (Battle et al., 2002).

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CONCLUSIONS

The results suggest that substance use during sex, particularly the use of alcohol and methamphetamine, may increase the risk of HIV infection for African-American and Latino YMSM by increasing the likelihood of inconsistent and non-condom use behaviors. Therefore, it is important for HIV prevention and sexual health programs to broadly address alcohol use among African-American and Latino YMSM. It is also critical to focus specifically on African-American and Latino YMSM using methamphetamine before or during sexual encounters with other men. Relationship status, recent homelessness, and peer connectedness were also associated with condom-use behavior. Facilitating connections to peers and addressing homelessness and primary relationship issues may also be important when tailoring prevention programs specifically with and for African-American, Latino, and multiracial YMSM. Since we found that homelessness was associated with non-condom use among participants at these venues, it also makes sense to ensure that condoms are made available to homeless YMSM, both at these pride events and also at other venues where they can be reached. Given our findings of a higher association between non-condom use and having a primary partner, addressing relationship issues may be particularly relevant for YMSM. This study suggests that it is important to continue to investigate the idea of closeness to peers as a protective factor in HIV prevention for YMSM.

It also recommends further exploration into the relationships between peer connectedness and other constructs found to be relevant for YMSM, such as community involvement, cultural factors, and social norms. Our findings suggest the importance of continuing to assess the effects of substance use during sex, relationship status, homelessness, and peer connectedness for African-American and Latino YMSM in multiple contexts. The findings are of particular use for service providers working with YMSM at pride events, where they may be able to address substance use, peer connectedness, homelessness, relationship, and other issues associated with condom-use behaviors among African-American and Latino YMSM.

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