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Social, Relational and Network Determinants of Unprotected Anal Sex and HIV Testing Among Men Who Have Sex with Men in Beirut, Lebanon

Glenn J. Wagner, PhD^a, Matthew Hoover, MPH^a, Harold Green, PhD^a, Johnny Tohme, MA^{b,c}, and Jacques Mokhbat, MD^{b,d}

^aRAND Corporation, Santa Monica, CA, USA

^bLebanese AIDS Society, Beirut, Lebanon

^cMarsa, Sexual Health Centre, Beirut, Lebanon

^dDivision of Infectious Diseases, University Medical Center Rizk Hospital, Beirut, Lebanon

Abstract

Social, relational and network determinants of condom use and HIV testing were examined among 213 men who have sex with men (MSM) in Beirut. 64% reported unprotected anal intercourse (UAI), including 23% who had UAI with unknown HIV status partners (UAIU); 62% had HIV-tested. In multivariate analysis, being in a relationship was associated with UAI and HIV testing; lower condom self-efficacy was associated with UAIU and HIV testing; gay discrimination was associated with UAIU; MSM disclosure was associated with UAI, UAIU and HIV testing; and network centralization was associated with HIV testing. Multi-level social factors influence sexual health in MSM.

Keywords

HIV prevention; gay men; Lebanon; sexual behavior; HIV testing; social networks

INTRODUCTION

According to UNAIDS, the Middle East and North Africa (MENA) region has the second fastest growing rate of HIV in the world, and has over half a million people living with HIV, including over 3,500 in Lebanon (UNAIDS, 2013). HIV in Lebanon and throughout the Middle East is mostly concentrated among marginalized groups, including men who have sex with men (MSM) (UNAIDS, 2013; Mumtaz et al., 2011). Compared to the general population rate of less than .01% in Lebanon (UNAIDS, 2013), the HIV prevalence among MSM is estimated to be 3.6% (Maufoud et al., 2010), and even higher rates of 5–10% are estimated among MSM in other countries within the region such as Egypt and Sudan

Corresponding Author: Glenn Wagner; RAND Corporation, 1776 Main St., Santa Monica, CA, USA 90407; (310) 393-0411, x7698; fax: (310) 260-8159; gwagner@rand.org.

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(Mumtaz et al., 2011; FHI/MOH Egypt, 2006; Elrasheid, 2006). Contributing factors to this heightened prevalence may be the gay-related stigma and discrimination common in conservative, Muslim dominant settings (Mumtaz et al., 2011); however, Beirut is one of the most socially progressive cities in the region, increasingly tolerant of cultural diversity and gay rights, and home to a vibrant and developing gay community (Healy, 2009). While research has examined the prevalence of HIV and related risk behaviors among MSM in Beirut (Maufoud et al., 2010), there have been no published in-depth investigations into the social determinants of sexual risk and HIV testing in this population.

Studies of determinants of condom use among MSM have typically focused on individual-level factors (Schwarcz et al., 2007; Shoptaw et al., 2009; O'Leary et al., 2005), yet the nature of sex is inherently relational and social, not only in terms of the relationship with the sexual partner, but also the influences of one's peer group. The nature of the relationship with the sex partner (Hoff, Chakravarty, Beougher, Neilands & Darbes, 2012), communication with partner about HIV status and sexual risk (Horvath, Smolenski, Iantaffi, Grey & Rosser, 2012), and perceived norms and support from peers regarding condom use (Liu, Liu, Cai & Hong, 2009; Amirkhanian et al., 2006) are all factors found to be associated with condom use among MSM in other parts of the world, but have not been studied in the Middle East.

Social Cognitive Theory emphasizes the social context in which an individual is embedded when explaining behavior (Glanz, Rimer & Lewis, 2002). Social networks, the relationships cultivated among individuals, are the foundation of the social context that influences behavior and self-efficacy (Friedman, 1995; Latkin, Forman, Knowlton & Sherman, 2003), information transfer, and establishment of social norms (El-Bassel, Gilbert, Wu & Chang, 2006). Individuals at risk for HIV often compare their own risk behavior to that of others in their network to assess whether to change their behavior (Hall & Wellman, 1985; House & Kahn, 1985). Perceived social norms about condom use diffuse across a network through communication and observation (Davey-Rothwell & Latkin, 2007a; Davey-Rothwell & Latkin 2007b). The level of connectedness within a network, or the extent to which information travels through specific individuals within a network, can influence the transfer of information, normative perceptions, and disease (Liu et al. 2009). In addition to larger sociocultural channels, social networks also serve as a key mechanism through which an individual experiences stigma and discrimination, and simultaneously are the locus of an individual's system of social support. Support and stigma, working through social networks, may influence an individual's knowledge and beliefs including condom use self-efficacy, and ultimately condom use and HIV testing (Raymond, Chen, Stall & McFarland, 2011).

In this paper we report on analyses that examined the social determinants of sexual risk behavior and HIV testing among MSM in Beirut, including characteristics associated with the relationship to the sex partner, peer norms and support for sexual health, and social network characteristics. Identifying such determinants will inform the development of HIV prevention interventions that address partner, peer and network level influences.

METHODS

Standard respondent-driven sampling (RDS) methodology was used to recruit the sample between May and December of 2012. RDS is an adaptation of chain-referral sampling as it relies on members of the study population to identify participants, and it is considered an effective methodology for reaching hidden populations (Salganik & Heckathorn, 2004). Eligibility criteria consisted of being biologically male and male-identified, age 18 years or older, fluent in English or Arabic, residing in greater Beirut, and having had oral or anal sex with a man in the past 12 months. Recruitment began with 7 persons designated as “seeds”. All participants, including seeds, received 4 recruitment coupons to recruit members of their social network, resulting in up to 8 waves of participants from seeds. Participants were instructed to give a coupon to eligible MSM peers who were interested in participating, and to inform the recruit to call the study coordinator for coupon verification, eligibility screening, verbal consent procedures and scheduling of an interview. The coupons were uniquely coded to link participants to their survey responses and for monitoring who recruited whom, and reimbursement of participants for recruitment of peers. After the interview, free optional finger-prick rapid tests were offered for HIV, along with pre- and post-test counseling from the trained interviewer.

The interview was administered at one of the collaborating community organizations or a neutral location preferred by the respondent. Participants were given \$30 for completing the interview and were told that they would receive \$10 for each peer recruit (up to 4) who enrolled in the study; hence a total of up to \$70 could be earned by each participant. Further details of the study procedures and sample descriptives have been published elsewhere (Wagner et al., 2014). The study protocol was approved by Institutional Review Boards at the RAND Corporation and Lebanese American University.

Measures

The survey was administered in English or Arabic, depending on the preference of the respondent, with computer-assisted interview software. The survey was developed in English and translated into Arabic using standard translation and back translation methods. The participant was given the option of completing the survey on their own or having the interviewer administer the survey; no statistics were collected, but study interviewers report that less than 5% of participants chose to self-administer the survey.

Demographics—These included age, education level, current work status, religious affiliation, self-identified sexual orientation (heterosexual, bisexual, gay, other), and current relationship status (being in a committed relationship or not).

Sexual behavior with men—Respondents were asked to indicate their number of male sex partners in the past 3 months. For receptive and insertive anal intercourse with men, respondents were asked: how many times they engaged in the act over the past 3 months, how many of those acts involved the use of a condom, and the HIV status of the partners with whom unprotected (no condom used) acts were engaged with. To assess partner HIV status, respondents were asked to indicate how many of these partners “told you he was HIV

negative and you had no reason to doubt it”, “you knew this man was HIV positive”, and “you were not completely sure of this man’s HIV status”.

History of HIV testing—Respondents were asked whether or not they had ever tested for HIV. Those who had tested were then asked if they had tested within the past 12 months, and the result of their last test.

Communication with partners about HIV status and risk—With a measure developed by McFarland et al. (McFarland et al., 2012), participants were asked to rate their level of agreement from 1 ‘strongly agree’ to 5 ‘strongly disagree’ with regard to the following statements: “I always talk to my sex partners about HIV status and risk before having sex with them,” and “If a partner tells me he is HIV negative, I always ask when he was last tested.” Item scores were reversed, and then the mean item score was calculated; higher scores represent greater communication.

Peer support for sexual health—With a measure developed by Bingham et al. (Bingham, 2012), respondents were asked to rate their level of agreement with 7 statements related to whether they have friends who provide support for sexual health [e.g., encouraging use of condoms and getting HIV tested; being available to talk if respondent discovers they have a sexually transmitted infection (STI) or have had risky sex; reminding respondent to protect against HIV and other STIs]; response options ranged from 1 ‘strongly agree’ to 5 ‘strongly disagree’, mean item score was calculated after reverse coding items, and higher scores represent greater peer support.

Peer sexual health norms—This was measured using items adapted from the Safer Sex Social Norm Perception Scale (Berg, Wilson, Li & Arnsten, 2012). Six questions assessed the respondent’s perception of their MSM friends’ sexual behaviors (e.g., use of condoms during anal sex with new and regular partners, getting HIV-tested, discussing STIs with new and regular partners); for each item the respondent rated their level of agreement with the statement on a scale of 1 ‘strongly agree’ to 5 ‘strongly disagree’, mean item score was calculated (after reverse coding some items), and higher scores represent a perception of healthier sex behavior being more normative among MSM peers.

Gay-related discrimination—Experience of perceived gay-related discrimination was measured with the subscale of the Multiple Discriminations Scale (Bogart, Landrine, Galvan, Wagner & Klein, 2013), which asks the respondent to indicate whether or not they experienced any of five types of discriminatory events (e.g., insulted or made fun of; denied or lost a job; physically assaulted) in the past year as a result of others thinking the respondent was gay or bisexual; the sum of types of discrimination experienced was used in analyses.

Condom use self-efficacy—This was measured using 6 items adapted from a scale developed by Forsyth et al (Forsyth, Carey & Fuqua, 1997). The respondent was asked to rate their level of agreement with statements about confidence in being able to use condoms during specific circumstances (e.g., with a regular partner, with someone the respondent has strong feelings for, when intoxicated); response options range from 1 ‘strongly agree’ to 5

‘strongly disagree’, mean item score was calculated (after most item scores were reversed), and higher scores represent greater self-efficacy.

Social network characteristics—To assess the respondent’s social network, we used a personal, egocentric network approach (McCarty, Bernard, Killworth, Shelley & Johnsen, 1997; McCarty, 2002), which focuses on the network of ties that surround the respondent. Participants were asked to list 20 individuals (or “alters”) with whom they have been in communication in the past 6 months (by phone, email, in person, etc.), starting with those most important to them. These individuals could include kin (immediate and extended family), friends, people they work with, neighbors, or others in the community. Research has demonstrated that 20 network members can reliably capture the variability in most network characteristics (McCarty, Killworth & Rennell, 2007). To assess *network composition*, the respondent was asked to describe the characteristics of each alter; for this analysis we included percentage of alters who were MSM, and percentage of alters who knew that the respondent was an MSM. We had planned to include the percentage of alters who knew the respondent was an MSM and were supportive of the respondent’s sexuality, but nearly all (98%) of alters who knew the respondent was an MSM were supportive, so we only included the knowledge variable. To assess *network structure*, respondents were asked to indicate if each unique pair of alters knows each other and how often they interact. Based on this information one can determine how interconnected the network is overall, and which alters are most connected to other alters. Network density was measured by the proportion of ties that exist proportionate to the number of ties that could exist between alters. Network centralization is a measure of the degree to which one or a few individuals maintain the majority of the ties in the network, such that the connections between alters within a network appears to have hub or center of concentrated ties. It is measured by summing the variance associated with the connections reported for each alter relative to the most popular member, and then dividing that sum by the theoretical maximum amount of variance possible for a network of the same size (Wasserman & Faust, 1994).

Data Analysis

When using RDS for recruitment, statistical weights can be calculated to generate representative estimates of the primary outcomes. However, we have opted to only use unadjusted (raw data) estimates in our analysis because of evidence suggesting that the weighted estimates were not reliable, as explained in greater detail elsewhere (Wagner et al., 2014).

For analysis, response categories were combined to create binary indicators for measures of education (at least some university education), monthly income (> \$1000 USD; note that US dollars is a regular currency in Lebanon), and consistent condom use (whether or not condoms were always used during anal sex in past 3 months). Bivariate statistics (2-tailed independent t-tests) were used to examine correlates of unprotected anal sex with men regardless of partner HIV status, unprotected anal sex with male partners of unknown HIV status, and any history of HIV testing. Logistic regression analysis was used to examine correlates of these three variables, which served as the dependent variables, in separate models. The independent variables that were entered into each model included

demographics (age, employment, any university education, monthly income), relational variables (relationship status, communication with sex partners regarding HIV status and risk), social support variables (peer support for sexual health, peer sexual health norms, gay-related discrimination), social network composition (percent of alters who were MSM, percent of alters who know the respondent is an MSM), social network structure (density, centralization), and condom use self-efficacy.

For the bivariate and multivariate data that are presented, the two unprotected anal sex variables were calculated using the entire sample as the denominator, with the 20 respondents who did not report anal sex with men in the past 3 months being classified as not having unprotected anal sex. We repeated these analyses with data only from the men who reported anal sex and in each analysis the results produced the same significant associations; hence, we chose not to present these data.

RESULTS

Sample Characteristics

A sample of 213 men enrolled in the study, including the 7 seeds. Mean age was 26.2 years (SD = 6.3; range: 18–52; 47% under age 25, 45% between ages 25 and 35, and only 8% over age 35), two-thirds (66%) self-identified as gay, most were employed (72%), 29% earned more than \$1000 per month, and 65% had some college education. Approximately equivalent proportions of the sample were Muslim (32%) or Christian (35%). Ninety-one participants (43%) reported currently being in a committed relationship, with 79 having a male primary partner and 12 a female partner (including one partner who was male to female transgendered); 46 had been with their partner for over twelve months, 33 for six to twelve months and 12 for less than six months. One participant self-reported being HIV-positive and two others tested positive in the post-interview rapid HIV antibody test; 15 others refused to test.

Prevalence and Correlates of Unprotected Anal Intercourse

Median number of male partners over the past 3 months was 2 (M = 4.4; SD = 7.9). Among men in a relationship, 62 (68%) reported their partner was their only sex partner over the past 3 months. One hundred and ninety-three men (91%) reported having anal intercourse with men in the past 3 months, including 118 (55%) who had receptive anal sex and 140 (66%) who had insertive anal sex (65 men engaged in both insertive and receptive). Ninety of the 118 men (76%) reported any unprotected receptive anal sex in the past 3 months, of whom 28 (31%) indicated that at least one unprotected encounter was with a partner of unknown HIV status (none reported such sex with a partner known to be HIV positive). Eighty-seven men (62%) reported any unprotected insertive anal sex in the past 3 months, of whom 28 (32%) indicated that at least one unprotected encounter was with a partner whose HIV status was positive (N=1) or unknown (N=27). Considering both receptive and insertive anal sex, 136 (70%) of the 193 men who had anal sex (or 64% of the whole sample) reported any unprotected anal sex within the past 3 months, of whom 49 (36% of those who had anal sex; 23% of the whole sample) had unprotected sex with an HIV-positive or unknown status partner. Given that only one respondent reported having

unprotected intercourse with an HIV-positive partner, we refer solely to unprotected intercourse with unknown HIV status partners when describing the analyses and findings related to this variable in the remainder of the paper.

Table 1 lists the bivariate correlates of unprotected anal intercourse with men. When HIV status of sex partners was not accounted for, having had unprotected anal intercourse was associated with demographics (younger age, having had any university education), relational variables (being in a committed relationship, less communication with partners about HIV status), social variables (having experienced more types of gay-related discrimination), lower condom use self-efficacy, and characteristics of social network composition (lower percentage of alters who were MSM, greater percentage of alters who know the respondent has sex with men) and structure (lower density). In the regression analysis, the variables that remained independently associated with unprotected sex included relationship status, with men in relationships being over 3 times more likely to not always use condoms, and greater percentage of alters who know the respondent has sex with men (see Table 2).

Regarding unprotected anal intercourse with unknown HIV status male partners, bivariate analysis revealed unprotected anal intercourse to be associated with earning less income, relational variables (not being in a committed relationship, less communication with partners about HIV status), social variables (having experienced more types of gay-related discrimination, lower peer support for sexual health, lower peer sexual health norms), lower condom use self-efficacy, and having fewer MSM alters (see Table 1). In regression analysis, relationship status was a significant correlate, with men in relationships being 94% less likely to have unprotected anal sex with unknown HIV status partners; other significant independent correlates included lower condom use self-efficacy, greater gay-related discrimination, and more alters knowing the respondent has sex with men (see Table 2).

Prevalence and Correlates of HIV Testing

Sixty-two percent (N=132) self-reported ever testing for HIV, and 42% (N=90) had tested within the past 12 months. Bivariate correlates of HIV testing prior to study participation included demographics (having any university education, having monthly income greater than \$1000), relational variables (being in a committed relationship, more communication with partners about HIV status and risk), social variables (greater peer support for sexual health, greater peer sexual health norms), greater condom use self-efficacy, having more alters who are MSM, and greater percentage of alters who know the respondent has sex with men (see Table 1). In regression analysis, the independent correlates of having ever been HIV tested were lower condom use self-efficacy, relationship status (men in a relationship were more than 3.5 times likely to have been tested), having more alters who know the respondent has sex with men, and greater network centralization (see Table 2).

DISCUSSION

Consistent with other studies of MSM in MENA (Mumtaz et al., 2011; Maufoud et al., 2010; El-Sayyed, Kabbash & El-Gueniedy, 2008), the rate of unprotected anal intercourse in this sample of MSM in Beirut was high, with nearly two-thirds having unsafe sex in the past 3 months, including a quarter who had no knowledge or certainty of the HIV status of their

sex partner(s). As for HIV testing, most men had been HIV-tested prior to the study, including nearly half who had tested within the past year, which compares favorably to the much lower rates observed in an earlier study in Beirut (Maufoud et al., 2010; Nakib & Hermez, 2002) and elsewhere in the region (El-Sayyed, Kabbash & El-Gueniedy, 2008). Our findings also revealed the influence of several social factors affecting condom use and HIV testing, at the level of sexual partnerships as well as MSM peers and respondents' overall social networks.

Relationship status appears to be a strong determinant of both condom use and HIV testing behavior. Consistent with our qualitative research with this population (Wagner, Aunon, Kaplan, Rana, Khouri & Tohme, 2012), men in committed relationships were almost 3 times more likely to engage in unprotected anal sex when the HIV status of their sex partner was known; for most, this partner was the person they were in a relationship with, as the majority of men in relationships reported that their significant other was their only sex partner in the past 3 months. Members of a couple are also more likely to know each other's HIV status, and this is supported by our finding that men in relationships are much more likely to have tested for HIV, as well as our qualitative research in which men described getting tested with their partner when entering a relationship as a step towards being comfortable not using condoms when having sex with each other (Wagner, Aunon, Kaplan, Rana, Khouri & Tohme, 2012). Conversely, men in relationships were much less likely to have unprotected sex with men whose HIV status was unknown. This all suggests that while men in relationships have more condomless sex, the context of this sexual activity involves several aspects of risk reduction, including mutual HIV testing and knowledge of partner's HIV status, as well as monogamy or limiting the number of sex partners. Yet studies of MSM in other parts of the world have shown that transmission often occurs in the context of sex with a regular partner (Sullivan, Salazar, Buchbinder & Sanchez, 2009), implying a vulnerability for these men that may be related to greater risk taking due to a false sense of safety (associated with assumed monogamy), and engagement in sex with partners outside of the relationship that is kept secret from one's primary partner (Gomez, Beougher, Chakravarty, Neilands, Mandic & Darbes, 2012).

Communication with sex partners about HIV status and risk was associated with consistent condom use and HIV testing in our bivariate analysis. These findings support the role of communication about HIV status and risk as a key facilitator of sexual health and HIV protective behaviors, and implies the need for HIV prevention interventions to focus on sexual risk communication with partners prior to engaging in sex. Indeed, several interventions have targeted communication about sex (Darbes et al., 2014), often through role-playing conversations about HIV status and risk. Communication with partner(s) about risk was a significant correlate in bivariate analysis, but not in the multiple regression analysis, perhaps because the regression models controlled for relationship status. Men in relationships may be more likely to discuss HIV risk or at least know each other's HIV status. Communication about sensitive issues such as HIV status and risk may be less comfortable in a casual relationship or with a relative stranger, and this may also explain why condoms are used more with casual sex partners, as condom use may be viewed as negating the need to enter into the awkward discussion of HIV status and risk.

Perceived normative behavior, or how one thinks their peers behave, has been shown to influence health behavior including condom use among MSM (Amirkhanian et al., 2006), so it is not surprising that our data revealed MSM peers to be influential with regards to both condom use and HIV testing in bivariate analysis. Receiving more support and encouragement from MSM peers for sexual health and HIV protective behaviors, as well as the perception that MSM peers are using condoms and getting HIV tested, were associated with consistently using condoms with partners of unknown HIV status and HIV testing. The potential influence that MSM peers can have on individual protective behaviors is further highlighted by our finding that having more MSM in one's social network is associated with using condoms consistently in bivariate analyses.

The other social network compositional variable associated with condom use and HIV testing was the proportion of network members who know the respondent is an MSM. Our data also showed that virtually all network members who know the respondent is an MSM are also supportive, rather than stigmatizing, of the respondent's sexuality. This social network characteristic was positively associated with HIV testing, but also with greater risk taking in terms of unprotected anal intercourse, including with unknown HIV status partners. This latter finding may seem counterintuitive, as social support is generally thought to protect against risk behavior (Hoff, Chakravarty, Beougher, Neilands & Darbes, 2012); however, this finding is similar to other analyses from this study that we have reported in which greater integration into the gay community was also associated with higher odds of engaging in unprotected anal sex (Tohme, Wagner & Mokhbat, 2014). In comparison to other cities in MENA, Beirut has a well-developed gay community and infrastructure of community organizations that provide support and services to MSM; therefore, it is plausible that men who are more involved in the gay community and receive affirmation for their sexuality are likely to be more exposed to information about HIV and people living with HIV and this may serve to desensitize some men to the threats of HIV disease (particularly in the context of effective HIV antiretroviral therapy), leading to disinhibition regarding condom use. In contrast, more isolated men may be more fearful and anxious about HIV risk and thus safer in their sexual behavior; alternatively, these men may also have fewer sexual encounters and therefore fewer opportunities to engage in risky sex. Further research is needed to examine these hypotheses.

Men who had been HIV-tested had social networks with a higher level of centralization. Centralization is an indicator for the extent to which connections or relationships between network members run through one or a few network members who serve as "hubs" for network relationships. These hubs can serve as gatekeepers of information, support and perceived network norms for specific behaviors and attitudes. The behavior and attitudes of these hub members have the potential to exert more influence on other members in both positive and negative ways. Given our findings, it is possible that men who had been HIV-tested may have hub members in their network who had also been tested and help set the tone for this behavior within the network; whereas networks that have lower centralization allow for a broader diffusion of information and social influence regarding perceived normative behavior.

A key limitation of our data is the representativeness of our sample. While respondent-driven sampling is designed to penetrate all segments of the target population, our sample lacks in representation of men who are middle-aged, of higher socioeconomic class, and who do not identify as gay. This may be an indication that stigma resulted in a selection bias, as these characteristics may be associated with greater internalized stigma and reluctance to participate in a study of MSM, or these may simply be characteristics of men who are less connected to other MSM. Other RDS-based studies of MSM have reported similar challenges in recruiting men with these characteristics (Yeka, Maibani-Michie, Prybylski & Colby, 2006), perhaps as a result of insufficient incentive or lack of intrinsic motivation to participate. Our measures are limited by the reliance on self-report, which can be biased in recall accuracy or as a result of subjective misinterpretation, especially with respect to perceptions of network member behaviors or strength of relations between network members. Furthermore, our cross-sectional data do not allow us to draw causal inferences from the associations observed in the data.

In summary, our findings lend support to the importance of understanding how social factors, at the partnership as well as the peer and network level, influence sexual health behavior among MSM in Beirut. To be most effective, efforts to promote HIV prevention and sexual health in this population need to focus on the levers of influence at each of these levels—from sexual partners to friends to one's larger network and community—recognizing that decisions to get HIV-tested and to use condoms in individual sexual encounters likely reflect an intersection of these multi-level social influences.

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Table 1

Bivariate Correlates of Any Unprotected Anal Intercourse and HIV Testing

	Any Unprotected Anal Intercourse (N=77)		Any Unprotected Anal Intercourse (w/ positive or unknown HIV status partners) (N=164)		Ever been HIV tested (N=132)	
	No	Yes	No	Yes	No	Yes
Demographics						
Mean age (years)	27.8 ^a	25.3 ^a	26.3	25.8	25.9	26.4
Currently employed	79%	68%	74%	65%	73%	72%
Have any college education	48% ^c	75% ^c	66%	61%	48% ^c	76% ^c
Monthly income > \$1000 USD	26%	31%	33% ^a	16% ^a	14% ^c	39% ^c
Condom use self-efficacy	4.62 ^c	3.84 ^c	4.39 ^c	3.21 ^c	3.90 ^b	4.25 ^b
Relational Variables						
In a committed relationship	27% ^c	51% ^c	51% ^c	16% ^c	25% ^c	54% ^c
Communication w/ partner about HIV status and risk	3.10 ^b	2.80 ^b	3.00 ^c	2.59 ^c	2.59 ^c	3.10 ^c
Peer and Social Variables						
Peer support for sexual health	3.23	3.08	3.33 ^c	2.47 ^c	2.63 ^c	3.44 ^c
Peer norms for sexual health	2.99	2.83	2.97 ^c	2.60 ^c	2.71 ^c	3.00 ^c
Gay-related discrimination	0.84 ^c	1.56 ^c	1.12 ^b	1.95 ^b	1.23	1.34
Social Network						
% of alters who are MSM	19% ^c	11% ^c	15% ^c	11% ^c	12% ^a	15% ^a
% of alters who know respondent is MSM	64% ^c	84% ^c	77%	79%	66% ^c	84% ^c
Network density	0.19 ^a	0.12 ^a	0.15	0.14	0.14	0.15
Network centralization	0.19	0.20	0.21	0.18	0.18	0.21

^a p < .05;^b p < .01;

100 > d_c

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Table 2

Multivariate Correlates of Any Unprotected Anal Intercourse and HIV Testing

	Any Unprotected Anal Intercourse OR (95% CI)	Any Unprotected Anal Intercourse (w/ positive or unknown HIV status partners) OR (95% CI)	Ever been HIV tested OR (95% CI)
Demographics			
Mean age (years)	1.06 (0.98, 1.16)	1.07 (0.98, 1.17)	0.99 (0.92, 1.06)
Currently employed	0.63 (0.27, 1.46)	1.82 (0.55, 6.47)	0.87 (0.32, 2.33)
Have any college education	2.11 (0.90, 5.01)	0.29 (0.07, 1.07)	1.42 (0.56, 3.57)
Monthly income > \$1000	2.64 (0.94, 7.87)	0.68 (0.15, 2.99)	1.70 (0.59, 4.99)
Condom use self-efficacy	1.15 (0.72, 1.86)	0.09 (0.03, 0.20) ^c	0.21 (0.10, 0.39) ^c
Relational Variables			
In a committed relationship	3.21 (1.52, 6.99) ^b	0.06 (0.01, 0.23) ^c	3.56 (1.58, 8.41) ^b
Communication w/ partner about HIV status and risk	1.69 (0.92, 3.22)	2.23 (0.87, 6.10)	0.80 (0.44, 1.42)
Peer and Social Variables			
Peer support for sexual health	1.30 (0.93, 1.83)	0.85 (0.53, 1.37)	1.05 (0.73, 1.50)
Peer norms for sexual health	1.18 (0.58, 2.43)	0.49 (0.15, 1.49)	0.88 (0.46, 1.71)
Gay-related discrimination	1.05 (0.77, 1.43)	1.62 (1.05, 2.60) ^a	1.11 (0.79, 1.55)
Social Network			
% of alters who are MSM	3.40 (0.21, 63.93)	0.40 (0.01, 20.38)	1.05 (0.07, 17.48)
% of alters who know respondent is MSM	7.74 (1.65, 41.75) ^a	19.54 (1.80, 310.67) ^a	6.65 (1.31, 37.08) ^a
Network density	2.42 (0.23, 29.16)	3.78 (0.11, 93.99)	0.14 (0.01, 1.94)
Network centralization	8.03 (0.39, 214.71)	0.17 (0.00, 13.07)	50.47 (2.43, 1741.96) ^a

^a p < .05;^b p < .01;^c p < .001