Published in final edited form as:

Sex Transm Dis. 2017 December ; 44(12): 732–738. doi:10.1097/OLQ.0000000000000680.

Longitudinal Findings on Changes in and the Link Between HIV-Related Communication, Risky Sexual Behavior, and Relationship Status in Men Who Have Sex With Men Living With HIV

Julianne M. Serovich, PhD, Tanja C. Laschober, PhD, Monique J. Brown, PhD, MPH, and Judy A. Kimberly, PhD

College of Behavioral and Community Sciences, University of South Florida, Tampa, FL

Abstract

Background—Reducing the risk of HIV transmission among men who have sex with men (MSM) is a national health priority. This study longitudinally examined changes in and the link between HIV-related communication, unprotected anal intercourse (UAI), and relationship status among MSM.

Methods—Data were obtained from 337 MSM living with HIV who participated in a randomized controlled study. Approximately equal percentages of men were randomized to either the disclosure intervention group or the attention control case management group. Repeated measures were collected at 5 time points for 12 months and included health-protective sexual communication (HPSC), HIV disclosure, insertive and receptive UAI, and relationship status. Data were analyzed using mixed-effects models.

Results—Independent of the treatment condition, HPSC and HIV disclosure increased over time; insertive UAI showed a curvilinear pattern but no significant decrease over time. Relationship status was related to HIV-related communication and UAI. Greater HPSC was related to less insertive and receptive UAI; disclosure was positively related to insertive UAI.

Conclusions—Based on the findings, prevention programs should continue to focus on improving HIV-related communication among MSM and consider relationship status in prevention messages. Intervention studies are needed to continue to identify and test factors that help reduce risky sexual behaviors.

Preventing and reducing the spread of HIV is a national health priority.¹ More than 1.2 million Americans are currently living with HIV and more than 39,500 individuals were newly diagnosed as having HIV infections in 2015.² Most (67%) infections occurred among men who have sex with men (MSM).² To prevent the transmission of HIV among MSM, the Centers for Disease Control and Prevention initiated the national *Start Talking. Stop HIV.*

Correspondence: Julianne M. Serovich, PhD, College of Behavioral and Community Sciences, University of South Florida, 13301 Bruce B. Downs Blvd, MHC 1110, Tampa, FL 33612-3807. jserovich@usf.edu.

Conflicts of Interest: The authors have no conflicts of interest to declare.

campaign in 2014,³ highlighting the importance of communication between sexual partners in reducing HIV transmission risk.⁴⁻⁸

HIV-related communication can be defined as exchange of information between sexual partners including HIV status disclosure and other health-protective sexual communication (HPSC), such as the discussion of sexual history, HIV testing, HIV infection risks (e.g., drug use and safer sex options), and use of condoms.^{3,9} Findings on the relationship between HIV-related communication and sexual behavior among MSM are mixed. For example, some studies show less risky sexual behavior in connection with related factors of HIV-related communication, such as HPSC and disclosure,^{10,11} whereas other studies note no relationship between sexual behavior and disclosure.^{12,13}

When examining sexual behavior and communication, it is also important to consider an individual's relationship status. Condom use is lower in main partner and monogamous relationships than in outside partner and open relationships.¹⁴⁻¹⁶ This may explain estimates that most men contract HIV from their main partners during unprotected anal intercourse (UAI).¹⁷ In addition, HIV disclosure is greater between primary and casual partners.¹⁸

Building on prior research, this theory-driven randomized controlled study examined changes in and the link between HIV-related communication, risky sexual behavior, and relationship status among MSM living with HIV. The Consequences Theory of HIV Disclosure¹⁹ proposes that seropositive individuals weigh the costs and rewards of disclosing their status to sexual partners. They are more likely to disclose when the anticipated rewards outweigh the associated costs. The focus was on assessing (1) changes in HPSC, HIV disclosure, and insertive and receptive UAI over time; (2) differences in HPSC, HIV disclosure, and UAI between an intervention and control group; and (3) differences in HPSC, HIV disclosure, and UAI based on 4 relationship types.

MATERIALS AND METHODS

Procedure

A randomized controlled study aimed at helping MSM decide whether and how to disclose their HIV seropositive status to sexual partners was conducted between 2009 and 2014 in 2 US metropolitan areas in the Midwest and Southeast. Eligibility criteria included MSM who were HIV positive, sexually active in the prior 3 months with at least 1 man, 18 years or older, English speaking, planning on living in the area for at least 1 year, and interested in learning more about serostatus disclosure to sexual partners. Recruitment occurred through local newspaper advertisements, local and state AIDS service organizations, AIDS clinical trials units, forums in the 2 metropolitan areas, and other HIV-related venues. The study protocol was approved by the institutional review boards of the Ohio State University for the Midwest area and the University of South Florida for the Southeast area. Written consent was obtained before the onset of the study from all eligible men who agreed to participate.

Design

Men who have sex with men were randomly assigned to either the assessment disclosure intervention (DI) group or the assessment attention control case management (ACCM)

group. Both groups participated in seven, 60- to 90-minute one-on-one sessions with trained facilitators. All facilitators were hired and trained by the principal investigator and were knowledgeable about HIV and LGBTQ issues, were comfortable with the target population, and were philosophically consonant with the intervention. Training primarily included becoming familiar with the manualized intervention protocols and role playing. For those facilitators hired after the study had been implemented, “shadowing” experienced facilitators and listening to the audio recordings of sessions were included in the training regimen. Digital recordings of all sessions were used for ongoing supervision and fidelity assurance of all facilitators. Independent coders were used to monitor adherence to the protocols by facilitators. In instances where intercoder reliability was less than the predetermined threshold, facilitators were given additional training/retraining in the protocol.

Each condition was administered during 4 sessions including 1 week post-baseline, 2 weeks post-baseline, 1.5 months post-baseline, and 3 months post-baseline (booster, no new material was offered at this time). Assessment-only sessions were at baseline, 6 months post-baseline, and 12 months post-baseline. Only the DI group sessions focused on potential HIV disclosure including rewards and costs of disclosure, strategies that support disclosure, management of negative reactions, and related disclosure exercises and practice opportunities. The ACCM group sessions used the Centers for Disease Control and Prevention’s HIV prevention case management program “Comprehensive Risk Counseling and Services”.²⁰ Both groups received training on reducing risky sexual behaviors.

Data Collection

Repeated measures were administered 1.5 months post-baseline, 3 months post-baseline, 6 months post-baseline, and 12 months post-baseline. Demographic characteristics were collected at baseline. All data were obtained using audio computer-assisted self-interviewing, which is related to more complete data collection of sensitive, potentially stigmatizing data.^{21,22}

Participants

Figure 1 shows the consort flow diagram; 417 of the 830 participants assessed for eligibility were eligible for the study. Of those, 339 MSM were randomly assigned to either the DI group ($n = 172$; 50.74%) or the ACCM group ($n = 167$; 49.26%). Table 1 shows the demographic characteristics of the participants who completed the survey at baseline ($N = 337$). With one exception, no significant differences ($P > 0.05$) in characteristics were found between the DI and ACCM groups. More MSM in the DI versus ACCM group were employed (36.05% vs. 25.00%, respectively; $P = 0.028$). In addition, there was only one significant difference in demographic characteristics between participants located in the Midwest compared with the Southeast. More MSM in the Southeast were of Hispanic ethnicity (13.29% vs. 4.88%, respectively; $P = 0.007$). Employment status, ethnicity, and location were included as control variables in the analyses.

Repeated Measures

Relationship Status—Participants reported whether they were currently (1) single and not dating, (2) single and dating, (3) committed/partnered and had sex with this partner only, or (4) committed/partnered and had sex with other people as well.

Health-Protective Sexual Communication—An 8-item modified version of the HPSC scale was used to assess the extent of communication with sexual partners.⁹ Topics included condom use, sexual history, HIV testing, and needle-related drug use. Response options ranged from (1) *never* to (4) *always*. The scale was created by summing responses across the items.

Disclosure Behavior—An author-derived 13-item measure examined the extent of disclosure in different sexual situations (e.g., oral sex with condom and unprotected insertive anal sex) and with different casual sexual partners (e.g., believed to be HIV negative). The stem question was “In the last 30 days, I have disclosed my HIV status to....” Response options ranged from 1 (*none of my sexual partners*) to 5 (*all of my sexual partners*). Participants could also select *not applicable* if the behavior did not apply to them, which was treated as missing data. The measure was created by summing responses across the items.

Risky Sexual Behavior—First, participants reported on the number of sexual encounters they had in the last 30 days. They then reported on the number of sexual encounters that involved insertive and receptive UAI. Second, the numbers of insertive and receptive UAI were divided by the number of sexual encounters and multiplied by 100 to derive the percentage of sexual encounters that involved insertive and receptive UAI. In the few instances where percentages were greater than 100, they were recoded to 100% (10/980 insertive UAI encounters, 9/986 receptive UAI encounters).

Control Variables

Seven participant characteristics were included in the analyses as control variables—racial identity (1, white; 2, African American; 3, other race/mixed race), Hispanic identity (0, not Hispanic; 1, Hispanic), sexual identity (0, bisexual; 1, gay), employment status (0, unemployed; 1, employed), age in years, and time since HIV diagnosis in years. We note here that 1 participant who identified as heterosexual was behaviorally bisexual and was subsequently grouped into the bisexual category. In addition, location of data collection (0, Midwest; 1, Southeast) was entered as a control variable.

Statistical Analysis

Data were analyzed with mixed-effects models using SAS version 9.4. Mixed-effects models (proc mixed) are commonly used with repeated measures or multilevel data (e.g., time nested within people).²³ Mixed-effects models (growth curves) require data with at least 3 time points; however, individual participants do not have to have data at all time points. Kenward-Roger’s approximation of the degrees of freedom was specified along with a variance component structure. A series of models were built and evaluated separately for each outcome—HPSC, HIV disclosure, insertive UAI, and receptive UAI.

Model 1 was run as an unconditional means model (i.e., no predictors) to obtain the intraclass correlation coefficient. Results showed that 64% of the variance of HPSC, 51% of HIV disclosure, 50% of insertive UAI, and 43% of receptive UAI were explained by within-participant nesting. In model 2, level 1 fixed effects (time and relationship status for HIV-related communication outcomes; time, relationship status, HPSC, and HIV disclosure for risky sexual behavior outcomes) were added; curvilinear time effects (time-squared, time-cubed) were also considered. In model 3, random slopes for level 1 predictors were added. In model 4, level 2 fixed effects (treatment condition and control variables) were added. In addition, time by level 1 predictors interaction and time by treatment interaction were considered. Random effects were only retained in the model when the Akaike information criterion and Bayesian information criterion indicated an improved model fit.²³ The final model included random slopes for the intercept and time for HIV-related communication outcomes, and a random slope for the intercept for risky sexual behavior outcomes.

RESULTS

Descriptive Statistics of Repeated Measures

Table 2 presents descriptive statistics of the repeated measures at each of the 5 time points. For relationship status, the category with the highest percentages across time was single-not dating (37.09%–43.72%) followed by single-dating (25.70%–33.53%), committed/partnered–no other sexual partners (13.35%–18.69%), and committed/partnered–other sexual partners (11.57%–16.02%). HIV-related communication suggested a linear increase over time. Health-protective sexual communication ranged from a mean of 14.92 at baseline to 16.45 at 12 months post-baseline and HIV disclosure ranged from a mean of 34.48 at baseline to 39.55 at 12 months post-baseline. Risky sexual behavior suggested a curvilinear pattern over time. The mean percentage of insertive UAI encounters ranged from 25.78 at baseline to 25.28 at 12 months. The mean percentage of receptive UAI encounters ranged from 27.05 at baseline to 27.13 at 12 months post-baseline.

HIV-Related Communication and Relationship Status

Before running the mixed-effects models with HIV-related communication outcomes (HPSC and HIV disclosure), changes in relationship status over time were considered. Analyses (not shown) using generalized estimating equations for nested multinomial outcomes (proc genmod) showed that relationship status overall did not change over time ($P = 0.343$) and did not vary by treatment condition ($P = 0.763$). However, further inspection of the data suggested that MSM moved in and out of the 4 relationship categories across time; 58% of MSM changed their relationship status at least once during the course of the study.

Table 3 shows the results from the final mixed-effects models on changes in HPSC and disclosure and the association with relationship status. Health-protective sexual communication significantly increased over time. However, there was no intervention effect. That is, regardless of treatment condition, HPSC improved over time. In comparison to MSM who were in committed/partnered relationships and had no other sexual partners, single MSM who were not dating reported lower HPSC. Regarding the control variables, employed compared with unemployed MSM had lower HPSC; older versus younger MSM

had lower HPSC; and compared with white MSM, black MSM had higher HPSC. Similar to HPSC, HIV disclosure significantly increased over time. Again, there was no intervention effect. In addition, MSM who were in committed/partnered relationships and had other sexual partners compared with those in committed/partnered relationships who had no other sexual partners reported less disclosure. None of the control variables showed a significant relationship to HIV disclosure.

Risky Sexual Behavior, HIV-Related Communication, and Relationship Status

As shown in Table 4, reports of insertive UAI changed in a curvilinear pattern, although there was no significant decrease over time. For both the DI and ACCM groups, initial reports of decreased insertive UAI after treatment were followed by increased insertive UAI before returning to baseline levels at 12 months post-baseline. There was no intervention effect. Men who have sex with men who had greater HPSC had less insertive UAI; MSM who reported greater HIV disclosure reported greater insertive UAI. Compared with MSM who were in committed/partnered relationships and had no other sexual partners, single MSM who were dating engaged in less insertive UAI. Regarding the control variables, MSM who identified as gay versus bisexual had lower reports of insertive UAI.

In contrast, there was no change in receptive UAI over time. There was also no intervention effect. However, greater HPSC was related to less receptive UAI. Compared with MSM who were in committed/partnered relationships and had no other sexual partners, single MSM (dating and nondating) engaged in less receptive UAI. Significant control variables were age and race, with older compared with younger MSM and other/mixed race MSM compared with white MSM reporting less receptive UAI.

DISCUSSION

This randomized controlled study examined changes in and the link between HIV-related communication (HPSC and disclosure), risky sexual behavior, and relationship status in MSM living with HIV. Regardless of condition (DI vs. ACCM), HPSC and HIV disclosure increased over time, whereas the percentages of insertive UAI fluctuated and did not sustain a decrease over time. Despite the lack of an intervention effect, particularly for HIV disclosure, which was the focus of the DI group, seeing a continuous increase in HPSC and disclosure is encouraging and important in reducing HIV transmissions.^{3,5,7,8}

Conversely, it is disconcerting to find a curvilinear pattern rather than a decrease in insertive UAI for either the DI group or the ACCM group and no change in receptive UAI. These findings are surprising insofar that both treatment condition sessions had a strong focus on reducing risky sexual behaviors. They are also in contrast to reviews of the literature that have found support for a decrease in risky sexual behaviors among MSM after behavioral interventions.^{4,24} At the same time, these findings highlight the complexity inherent in designing interventions to reduce risky sexual behaviors and the need for continued investigations into factors that decrease and maintain the decrease in risky sexual behaviors among MSM.

Congruent with prior research, MSM who had greater HPSC reported less insertive and receptive UAI.^{25,26} Thus, HPSC had a positive effect on reducing risky sexual behavior and should continue to be a focus in future prevention and intervention studies. However, MSM who mentioned greater HIV disclosure also reported more insertive UAI. It may be that HIV disclosure revealed that a partner was also HIV positive. Thus, serosorting may have been used as a strategy to reduce the risk of HIV transmission.²⁷

Findings on relationship status and the association with HIV-related communication and UAI were inconsistent and mixed. Compared with MSM in committed/partnered relationships who had no other sexual partners, those who were single and not dating had lower HPSC, but those who were single and dating had less UAI. The HPSC measure is designed specifically for use with new sexual partners.⁹ Thus, in contrast to our findings, it is expected that HPSC might be lower in committed relationships with no other sexual partners. Similar to our findings, prior studies have found lower condom use in main partner relationships.^{14,16} The mixed findings suggest that interventions and prevention programs focus on different subgroups of MSM based on their relationship status, as they may benefit from different communication strategies and methods to reduce the risk of HIV transmission.

LIMITATIONS AND CONCLUSIONS

Findings from the current sample of nonrandomly selected MSM, despite randomization into either a DI or an ACCM group, may not apply to MSM more generally. That is, it is possible that MSM who decide to participate in an intervention study differ from other MSM in a number of characteristics including demographics and behaviors such as communication and sexual activities. Repeated self-reported measures of HIV-related communication (HPSC and disclosure), risky sexual behaviors, and relationship status may also be limitations of this study. Despite the use of audio computer-assisted self-interviewing, which is recommended for studies collecting sensitive information, response bias such as social desirability is a concern.

Findings from this study add to the literature and practical knowledge in 2 essential areas. Examining subgroups of MSM based on their relationship status provides a greater understanding of factors that affect HPSC, disclosure, and risky sexual behavior. Moreover, findings from a randomized controlled intervention study provide a clearer understanding of behavior changes over time and factors that facilitate, hinder, or maintain changes over time to reduce risky sexual behavior and the transmission of HIV, which strengthen the development and refinement of HIV prevention programs.

Acknowledgments

This study was supported by a grant from the National Institute of Mental Health (R01MH082639) awarded to the first author. The authors thank the men who participated in this study.

References

1. Office of National AIDS Policy. [Accessed February 3, 2017] National HIV/AIDS strategy for the United States: Updated to 2020. 2015. Available at: <https://www.aids.gov/federal-resources/national-hiv-aids-strategy/nhas-update.pdf>
2. Centers for Disease Control and Prevention. [Accessed March 1, 2017] HIV in the United States: At a glance. 2016. Available at: <https://www.cdc.gov/hiv/statistics/overview/ataglance.html>
3. Centers for Disease Control and Prevention. [Accessed March 3, 2017] Start Talking. Stop HIV. Preventing new HIV infections through open conversations. 2014. Available at: <https://www.cdc.gov/nchhstp/newsroom/docs/factsheets/stsh-factsheet-508.pdf>
4. Johnson WD, Diaz RM, Flanders WD, et al. Behavioral interventions to reduce risk for sexual transmission of HIV among men who have sex with men. *Cochrane Database Syst Rev*. 2008;CD001230. [PubMed: 18646068]
5. Horvath KJ, Oakes JM, Rosser BS. Sexual negotiation and HIV serodisclosure among men who have sex with men with their online and offline partners. *J Urban Health*. 2008; 85:744–758. [PubMed: 18649141]
6. O'Connell AA, Reed SJ, Serovich JA. The efficacy of serostatus disclosure for HIV transmission risk reduction. *AIDS Behav*. 2015; 19:283–290. [PubMed: 25164375]
7. Tobin KE, Yang C, Sun C, et al. Discrepancies between HIV prevention communication attitudes and actual conversations about HIV testing within social and sexual networks of African American men who have sex with men. *Sex Transm Dis*. 2014; 41:221–226. [PubMed: 24622631]
8. Wilton L, Herbst JH, Coury-Doniger P, et al. Efficacy of an HIV/STI prevention intervention for black men who have sex with men: Findings from the Many Men, Many Voices (3MV) project. *AIDS Behav*. 2009; 13:532–544. [PubMed: 19267264]
9. Catania, JA., Fisher, TD., Davis, CM., Yarber, WL., et al. *Handbook of Sexuality-Related Measures*. Thousand Oaks, CA: Sage; 2011. p. 591-594.
10. Hightow-Weidman LB, Phillips G 2nd, Outlaw AY, et al. Patterns of HIV disclosure and condom use among HIV-infected young racial/ethnic minority men who have sex with men. *AIDS Behav*. 2013; 17:360–368. [PubMed: 23054043]
11. Noar SM, Carlyle K, Cole C. Why communication is crucial: Meta-analysis of the relationship between safer sexual communication and condom use. *J Health Commun*. 2006; 11:365–390. [PubMed: 16720536]
12. Edwards-Jackson N, Phanuphak N, Van Tieu H, et al. HIV serostatus disclosure is not associated with safer sexual behavior among HIV-positive men who have sex with men (MSM) and their partners at risk for infection in Bangkok, Thailand. *AIDS Res Ther*. 2012; 9:38. [PubMed: 23259683]
13. St De Lore J, Thiede H, Cheadle A, et al. HIV disclosure and subsequent sexual behaviors among men who have sex with men who meet online. *J Homosex*. 2012; 59:592–609. [PubMed: 22500995]
14. Blashill AJ, Wilson JM, O'Cleirigh CM, et al. Examining the correspondence between relationship identity and actual sexual risk behavior among HIV-positive men who have sex with men. *Arch Sex Behav*. 2014; 43:129–137. [PubMed: 24198170]
15. Brady SS, Iantaffi A, Galos DL, et al. Open, closed, or in between: Relationship configuration and condom use among men who use the Internet to seek sex with men. *AIDS Behav*. 2013; 17:1499–1514. [PubMed: 23008123]
16. Hoff CC, Chakravarty D, Beougher SC, et al. Relationship characteristics associated with sexual risk behavior among MSM in committed relationships. *AIDS Patient Care STDS*. 2012; 26:738–745. [PubMed: 23199191]
17. Sullivan PS, Salazar L, Buchbinder S, et al. Estimating the proportion of HIV transmissions from main sex partners among men who have sex with men in five US cities. *AIDS*. 2009; 23:1153–1162. [PubMed: 19417579]
18. Przybyla SM, Golin CE, Widman L, et al. Serostatus disclosure to sexual partners among people living with HIV: Examining the roles of partner characteristics and stigma. *AIDS Care*. 2013; 25:566–572. [PubMed: 23020136]

19. Serovich JM. A test of two HIV disclosure theories. *AIDS Educ Prev*. 2001; 13:355–364. [PubMed: 11565594]
20. Centers for Disease Control and Prevention. [Accessed January 12, 2017] Comprehensive Risk Counseling and Services (CRCS). 2015. Available at: <https://effectiveinterventions.cdc.gov/en/highimpactprevention/publichealthstrategies/CRCS.asp>
21. Kelly CA, Hewett PC, Mensch BS, et al. Using biomarkers to assess the validity of sexual behavior reporting across interview modes among young women in Kampala, Uganda. *Stud Fam Plann*. 2014; 45:43–58. [PubMed: 24615574]
22. Perlis TE, Des Jarlais DC, Friedman SR, et al. Audio-computerized self-interviewing versus face-to-face interviewing for research data collection at drug abuse treatment programs. *Addiction*. 2004; 99:885–896. [PubMed: 15200584]
23. Bell, BA., Ene, M., Smiley, W., et al. [Accessed March 3, 2017] A multilevel model primer using SAS PROC MIXED. 2013. Paper 433-2013 Available at: <http://sup-port.sas.com/resources/papers/proceedings13/433-2013.pdf>
24. Sullivan PS, Carballo-Dieguez A, Coates T, et al. Successes and challenges of HIV prevention in men who have sex with men. *Lancet*. 2012; 380:388–399. [PubMed: 22819659]
25. Jacobs RJ, Kane MN, Ownby RL. Condom use, disclosure, and risk for unprotected sex in HIV-negative midlife and older men who have sex with men. *Am J Mens Health*. 2013; 7:186–197. [PubMed: 23093078]
26. Widman K, Golin CE, Noar SM. When do condom use intentions lead to actions? Examining the role of sexual communication on safer sexual behavior among people living with HIV. *J Health Psychol*. 2013; 18:507–517. [PubMed: 22689591]
27. Grov C, Rendina HJ, Moody RL, et al. HIV serosorting, status disclosure, and strategic positioning among highly sexually active gay and bisexual men. *AIDS Patient Care STDS*. 2015; 29:559–568. [PubMed: 26348322]

Figure 1.
Consort flow diagram.

TABLE 1**Participant Baseline Characteristics (N = 337)**

Race, f (%)	
White/Caucasian	161 (47.92)
African American/black	123 (36.60)
Other/mixed	52 (15.48)
Non-Hispanic ethnicity, f (%)	306 (90.80)
Sexual identity, f (%)	
Gay	267 (79.46)
Bisexual	69 (20.54)
Highest level of education, f (%)	
Less than a high school degree or GED	34 (10.13)
High school degree or GED	78 (23.21)
Some college experience	147 (43.75)
Bachelor's degree	62 (18.45)
Postgraduate degree	15 (4.46)
Employed, f (%)	103 (30.65)
Location, f (%)	
Midwest	164 (48.66)
Southeast	173 (51.34)
Income, f (%)	
up to \$500	101 (30.06)
\$501–\$1000	96 (28.57)
\$1001–\$1500	70 (20.83)
\$1501–\$2000	39 (11.61)
>\$2000	30 (8.93)
Age, M (SD), y	42.11 (11.00)
Years since HIV-positive diagnosis, M (SD)	10.94 (8.37)

F, frequency; GED, general educational development; M, mean.

TABLE 2

Repeated-Measures Descriptive Statistics: Relationship Status, HIV-Related Communication, and Risky Sexual Behavior

	Baseline (N = 337)	Posttreatment (n = 268)	Booster (n = 259)	6 mo (n = 249)	12 mo (n = 214)
Relationship status, f, (%)					
Single-not dating	125 (37.09)	114 (42.54)	110 (42.64)	108 (43.72)	90 (42.06)
Single-dating	113 (33.53)	81 (30.22)	81 (31.40)	74 (29.96)	55 (25.70)
Committed-other sexual partners	54 (16.02)	31 (11.57)	30 (11.63)	31 (12.55)	29 (13.55)
Committed-no other sexual partners	45 (13.35)	42 (15.67)	37 (14.34)	34 (13.77)	40 (18.69)
HIV-related communication					
HPSC, M (SD)	14.92 (5.13)	15.12 (5.49)	15.86 (5.90)	15.61 (5.92)	16.45 (6.32)
(n, range)	(334, 6–32)	(267, 4–32)	(258, 6–32)	(248, 4–32)	(211, 2–32)
HIV seropositive status disclosure, M (SD)	34.48 (16.22)	35.05 (16.65)	36.28 (17.32)	36.11 (15.97)	39.55 (16.81)
(n, range)	(315, 4–65)	(223, 2–65)	(219, 1–65)	(215, 1–65)	(182, 8–65)
Risky sexual behavior					
% Insertive UAI, M (SD)	25.78 (37.17)	21.46 (35.83)	27.34 (39.37)	28.24 (38.74)	25.28 (38.45)
(n, range)	(283, 0–100)	(186, 0–100)	(183, 0–100)	(183, 0–100)	(152, 0–100)
% Receptive UAI, M (SD)	27.05 (36.27)	22.69 (36.45)	28.22 (39.29)	24.03 (37.46)	27.13 (38.84)
(n, range)	(290, 0–100)	(186, 0–100)	(185, 0–100)	(178, 0–100)	(154, 0–100)

F, frequency; M, mean.

TABLE 3

Changes in HIV-Related Communication and Association With Relationship Status

	HPSC				HIV Disclosure			
	Estimate	SE	t	P	Estimate	SE	t	P
Time	0.42	0.08	5.32	<0.0001	1.20	0.27	4.48	<0.0001
Intervention	0.27	0.51	0.53	0.593	0.09	1.51	0.06	0.949
Relationship status								
Single-not dating	-0.89	0.43	-2.07	0.039	-2.29	1.46	-1.57	0.117
Single-dating	-0.75	0.42	-1.77	0.077	0.48	1.41	0.34	0.734
Committed-other sex partners	-0.88	0.51	-1.74	0.083	-4.70	1.70	-2.76	0.006
Committed-no other sex partners								
Control variables								
Race								
White								
Reference group								
Black	1.84	0.59	3.11	0.002	-2.38	1.75	-1.35	0.177
Other/mixed	0.10	0.85	0.12	0.905	-3.50	2.59	-1.35	0.178
Hispanic	-0.49	1.00	-0.49	0.622	1.95	2.99	0.65	0.515
Sexual orientation, gay	-0.60	0.67	-0.90	0.368	-1.55	1.99	-0.78	0.436
Employed	-1.38	0.57	-2.44	0.015	-2.31	1.67	-1.38	0.168
Southeast location	-0.44	0.53	-0.82	0.411	-0.83	1.59	-0.53	0.599
Age	-0.08	0.03	-2.70	0.007	-0.15	0.09	-1.65	0.099
Time since diagnosis	0.02	0.04	0.58	0.564	-0.03	0.11	-0.25	0.799

Bold *P*-values indicate statistically significant findings at *P* < .05.

TABLE 4
Changes in Risky Sexual Behavior and Associations With HIV-Related Communication and Relationship Status

	Insertive UAI			Receptive UAI		
	Estimate	SE	t	Estimate	SE	t
Time	-10.28	5.01	-2.05	0.041	-3.02	5.26
Time-squared	7.73	3.29	2.35	0.019	1.29	3.47
Time-cubed	-1.34	0.55	-2.45	0.015	-0.14	0.58
Intervention	0.15	3.43	0.04	0.965	2.75	3.31
HIV-related communication						
HPSC	-0.54	0.26	-2.11	0.035	-0.92	0.26
HIV disclosure	0.22	0.08	2.78	0.005	0.07	0.08
Relationship status						
Single-not dating	-3.27	3.79	-0.86	0.388	-7.82	3.87
Single-dating	-8.46	3.59	-2.36	0.019	-9.59	3.69
Committed-other sex partners	-3.58	4.26	-0.84	0.402	-3.83	4.43
Committed-no other sex partners						
Control variables						
Race						
White						
Black	0.70	4.10	0.17	0.865	-3.12	3.95
Other/Mixed	-11.23	5.99	-1.88	0.062	-15.39	5.80
Hispanic	9.22	6.83	1.35	0.178	10.03	6.63
Sexual orientation, gay	-9.93	4.59	-2.16	0.031	0.34	4.43
Employed	0.50	3.81	0.13	0.895	0.18	3.67
Southeast location	5.01	3.63	1.38	0.169	3.10	3.49
Age	-0.33	0.20	-1.59	0.113	-0.54	0.20
Time since diagnosis	0.34	0.25	1.33	0.183	0.36	0.24

Bold *P*-values indicate statistically significant findings at *P* < .05.