

Examining the Role of Serostatus Disclosure on Unprotected Sex Among People Living with HIV

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Abstract

Given the increasing prevalence of HIV, it is important to identify factors associated with safer sex behaviors between people living with HIV and their partners. Utilizing a diverse sample of 242 HIV-infected adults [$n=69$ men who have sex with men (MSM); $n=68$ men who have sex with women (MSW); $n=105$ women who have sex with men (WSM)], we examined the association between serostatus disclosure and unprotected anal or vaginal intercourse (UAVI) and the moderating effect of sexual behavior group on this association. Overall, 88.7% disclosed to their current partner. Approximately 18.8% of MSM, 17.7% of MSW, and 29.5% of WSM reported UAVI. Controlling for age, time since diagnosis, and partner serostatus, we found main effects on UAVI for disclosure and sexual behavior group; specifically, disclosure was inversely related to unprotected sex [AOR=0.09, 95% CI (0.02, 0.43), $p<0.001$], and MSM were less likely to engage in UAVI relative to WSM [AOR=0.11, 95% CI (0.17, 0.82), $p<0.05$]. However, the relationship between disclosure and UAVI was not moderated by sexual behavior group. Future strategies that aim to increase disclosure to partners may consider focusing on its value as a means by which to reduce sexual risk behavior.

Introduction

ONE ASPECT OF PROMOTING AND MAINTAINING sexual health is the avoidance of transmitting or acquiring a sexually transmitted infection through engagement in safer sex behaviors. However, practicing safer sex presents challenges that may be greater for individuals with chronic sexually transmitted infections, including people living with HIV (PLHIV). Although being diagnosed with HIV has been associated with a significant reduction in sexual risk behavior,¹⁻³ a substantial minority of PLHIV continue to engage in unprotected sex.⁴⁻⁷ Others may decrease sexual risk behavior immediately after diagnosis but show a rebound in these behaviors in subsequent months or years. For example, one study of men who have sex with men (MSM) who were recently infected with HIV found that the percentage of unprotected sex with unknown serostatus partners decreased from 49% at baseline to 25% at 6 months, but then rebounded to 71% at 12 months.² Another study that followed trends in sexual behavior pre- and post-HIV diagnosis found a 53% probability of unprotected sex at 1 year after diagnosis, but an increase to 61% 4 years after diagnosis.⁵ Ongoing efforts to

identify those factors that promote safer sexual behaviors between PLHIV and their partners are needed.

Serostatus disclosure is fundamental to our understanding of the experience of HIV as an illness, because of its connection to privacy, ethical responsibility, and its possible function in prevention of disease transmission risk. Several reasons underlie serostatus disclosure as one possible component of risk reduction. Serostatus disclosure provides an opportunity for sexual partners to make informed decisions about a tolerable level of transmission risk,⁸ leading them to either decide to forego sexual activity or to engage in deliberately safer sexual behaviors. From a public health perspective, disclosing to a sexual partner may prompt those who are unaware of their HIV status to seek testing.⁹ Furthermore, the success of recent clinical trials of antiretroviral preexposure prophylaxis (PrEP)¹⁰⁻¹² highlights how disclosure may allow uninfected individuals to make decisions about the use of PrEP to reduce further their risk of HIV acquisition. As PrEP and other options have become available, the possible benefits of serostatus disclosure are increasingly recognized, including among subgroups such as pregnant women.¹³ Despite the possible benefits, it is clear that decisions to disclose are complex and often influenced by many factors.

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While some PLHIV are motivated to disclose because it offers opportunities for social support,^{10–11} makes serosorting and PrEP discussions possible, and can make seeking and remaining in medical care easier,¹⁶ disincentives to revealing one's status are common, including fears of stigmatization,^{12,13} rejection,¹⁴ or physical and emotional abuse.¹⁵

In the past 15 years, the pace of theory development specific to HIV serostatus disclosure has grown but with a limited scope; a general focus on disclosure likelihood rather than disclosure outcomes has impeded understanding the relationship between serostatus disclosure decisions and sexual behavior choices for PLHIV. Most theories, such as disease progression theory, emphasize the processes and motivations of the behavior based on beliefs about the costs and benefits associated with disclosure.^{16–18} Accordingly, disclosure decisions are postulated to occur most often when HIV has advanced to symptomatic AIDS, making it challenging to hide one's illness.^{19,20} However, empirical research has not demonstrated consistent associations between disease stage and disclosure to sexual partners.²² Alternatively, consequence theory proposes that the decision to disclose one's HIV serostatus occurs after a conscientious analysis of the anticipated positive and negative outcomes of that decision.²³ Empirical studies of consequence theory have shown to predict disclosure to friends and family members, but not to sexual partners.^{22,26} Finally, the disclosure processes model improves upon previous theories by recognizing the role played by the antecedent goals of disclosure, the mediating processes of disclosure decisions, and the outcomes of these decisions. This model specifies that disclosure can affect dyadic outcomes because knowledge of a partner's serostatus can influence sexual risk perceptions and consequently sexual risk behavior.²⁷ While the disclosure processes model recognizes that serostatus disclosure affects sexual risk behavior, it does not go so far as to postulate the direction of the effect, perhaps because the effect may vary in different contexts or in different groups.

The primary gaps in these theories are a general lack of distinction between the target of the disclosure information (e.g., family, sexual partners) and the absence of their application among different groups of PLHIV, particularly men and women with opposite sex partners.^{23–27} We know there are differences in sexual risk behavior patterns between HIV-infected MSM, men who have sex with women (MSW), and women who have sex with men (WSM).^{28–33} These differences suggest that the costs, benefits, and outcomes associated with serostatus disclosure may also differ between groups.²² In fact, several studies have found differences between these three groups in serostatus disclosure to sex partners.^{18,32,34,35} Specifically, HIV-positive MSM are typically less likely to disclose to sexual partners relative to MSW and WSM, citing fears of rejection, issues of confidentiality, and concerns of stigmatization as barriers to HIV disclosure.^{19,36} These findings, combined with the disclosure processes model, suggest that disclosure goals and effects on behavior may vary for different sexual behavior groups. Additional empirical attention may help us more fully understand the role of disclosure, not merely the likelihood that disclosure will occur, in facilitating safer sex as a behavioral outcome.

Unlike studies of sexual communication among the general population, empirical studies examining the relationship between serostatus disclosure and condom use among PLHIV are few and their findings are mixed. Some studies

have found a positive association between serostatus disclosure and condom use.^{37–40} Using data from a heterogeneous study of heterosexual, gay, and bisexual PLHIV, a recent mathematical modeling analysis concluded that disclosure can reduce the risk of HIV transmission by between 17.9% to 40.6% by increasing condom use rates among prospective partners who agree to engage in sexual activity.⁴¹ Other studies, however, found no association between disclosure and condom use.^{42–44} Although the body of literature attempting to understand the relationship between serostatus disclosure and unprotected sex among PLHIV is growing, it has been common for studies to focus exclusively on specific behavioral risk groups, such as MSM or bisexual men, or to make direct comparisons between genders by combining MSM and MSW and comparing them collectively to women. Study designs that combine sexual behavior groups may miss important between-group differences that can aid in development of effective interventions targeting unique behaviors within and among these three groups.^{28,30,31} Inconsistencies in previous research and the relatively few studies directly comparing sexual behavior groups suggest that critical gaps exist in our understanding of the relationship between serostatus disclosure and unprotected sexual activity among PLHIV.

The goal of the current research was to explore the central hypotheses that HIV serostatus disclosure was inversely associated with unprotected sex and that membership in a certain sexual behavior group (MSM, MSW, and WSM) moderates this association. Using the disclosure processes model as a guiding theoretical framework, we set out to answer explored three specific research questions: (1) Do HIV serostatus disclosure and unprotected sex vary between sexual behavior groups? (2) Is serostatus disclosure inversely associated with unprotected sex? (3) Does the strength of the relationship between serostatus disclosure and unprotected sex vary by sexual behavior group? The answers to these questions will help determine whether and the extent to which serostatus disclosure and sexual behavior group membership should be stressed in sexual risk reduction interventions among PLHIV.

Methods

Participants

The data for the current study come from the baseline assessment of SafeTalk, a randomized, controlled trial that evaluated the efficacy of a motivational interviewing-based, safer sex intervention for 490 HIV-infected patients in clinical care.⁴⁵ Data were collected through an audio computer-assisted self-interview (ACASI) that lasted approximately 30–60 min. For the present study, our analysis was restricted to SafeTalk participants who reported being sexually active with only one partner in the previous 3 months to allow for linkage of reported sexual behavior with disclosure to a specific sexual partner ($n=242$). The University of North Carolina at Chapel Hill's Office for the Protection of Human Research approved all study procedures.

Measures

Demographic, clinical, and substance use factors. We assessed participants' gender, age, race, education, and

employment status as well as self-reported clinical characteristics related to HIV (current antiretroviral therapy, whether their most recent viral load test was undetectable, date of diagnosis). We also assessed amount of alcohol, marijuana, and crack cocaine use in the last 3 months and dichotomized each substance use variable (any use/no use).

Sexual behavior groups. We determined participants' sexual behavior group membership based on their gender and the gender of their reported sexual partner to create three groups: MSM, MSW, and WSM. Of note, four women reported sexual behavior exclusively with other women; these women were not included in the current project given the small sub-sample size.

Partner serostatus. Participants were asked about the HIV serostatus of their sexual partner with response options of "positive," "negative," or "not sure." We dichotomized this variable into seroconcordant (i.e., partner's HIV serostatus positive) versus serodiscordant (i.e., partner's HIV serostatus negative or unknown) partnerships to reflect partners at risk of HIV acquisition.

HIV disclosure. We assessed HIV serostatus disclosure as an active, voluntary behavior using a one-item question that asked participants, "Did this partner know that you were HIV-positive because you told him/her that you were positive?"

Sexual behaviors. Based on the study participant's gender and the reported partner's gender, the ACASI gathered detailed information about sexual behavior in the last 3 months. Participants were asked the number of times they had vaginal or anal intercourse with their partner. For each type of sex act, participants were also asked how many times a condom was used from the beginning to the end of penetration. For the current study, we used this sexual behavior data to create outcome variables representing whether the individual had engaged in any unprotected sex acts in the last 3 months. The outcome variables were combined and then dichotomized, since they were not normally distributed, into 0 = no unprotected anal or vaginal intercourse (UAVI) and 1 = at least one episode of UAVI.

Statistical analyses

To answer our research questions, we analyzed our data in three stages. First, we conducted descriptive analyses of baseline characteristics of the three groups (MSM, MSW, and WSM) to characterize the study sample. Second, to determine if the prevalence of serostatus disclosure and UAVI varied between the sexual behavior groups, we planned a two-step testing approach. A two degrees of freedom Chi-square statistic was calculated to test the global hypothesis of equality of prevalence among the three groups. If this test rejected the global null hypothesis, we then conducted pairwise comparisons with one degree of freedom Chi-square statistics with Bonferroni-adjusted post-hoc tests to maintain a family-wise Type 1 error rate of $p < 0.05$. Finally, to test the joint effects of serostatus disclosure status and sexual behavior group on UAVI, we constructed a multivariate logistic regression model with disclosure status, sexual behavior group, and their interactions as predictors. The model also

included a set of potential confounding variables (age, time since HIV diagnosis, and partner HIV serostatus) selected based on their associations with both HIV serostatus disclosure and unprotected sex in previous studies.^{26,37,43,46,47} We followed the strategy of testing the global hypothesis of no interaction first. If interactions were present, the plan was to use the predicted probabilities to examine the disclosure effect by sexual behavior groups. We report adjusted odds ratios (AORs) and 95% confidence intervals (CIs). We used STATA version 12 (College Station, Texas) for all data analyses.

Results

Serostatus disclosure, sociodemographic, and health characteristics of study participants

Participants in the current study included 242 individuals: 69 MSM (28.5%), 68 MSW (28.1%), and 105 WSM (43.4%). Participants ranged in age from 19–67 ($M = 42.7$, $SD = 8.9$). Most participants were African American (71.1%), and approximately two-thirds of the sample were unemployed. More than half reported an undetectable viral load and the average length of time since HIV diagnosis was 9.5 years (range = 6 months to 23.25 years, $SD = 5.7$). With respect to partner serostatus, nearly 65% of the sample had sexual partners who were either HIV-negative or of unknown serostatus (i.e., serodiscordant). Analyses of variance and Chi-square tests detected significant differences between sexual behavior groups on age, race, educational attainment, and alcohol use. In the full sample, 88.7% of individuals disclosed their serostatus to their current sexual partner. Disclosure was nonsignificantly less likely for MSM (81.2%) relative to MSW (92.5%) and WSM (91.2%) [$\chi^2(2) = 5.50$, $p = 0.06$]. Additional participant demographic, clinical, substance use, and partnership characteristics are shown in Table 1.

Relationship between HIV serostatus disclosure with UAVI

Table 2 presents the prevalence of UAVI in the full sample and stratified among those individuals with and without HIV serostatus disclosure to their partners. Regarding unprotected sexual behavior in the past 3 months, 23.1% of participants reported engaging in UAVI. Within sexual behavior groups, 18.8% of MSM, 17.7% of MSW, and 29.5% of WSM reported engaging in UAVI. However, these proportions did not differ significantly [$\chi^2(2) = 4.28$, $p = 0.11$]. The prevalence of UAVI among those who disclosed was 16.1% for MSM, 17.7% for MSW, and 26.9% for WSM. The observed UAVI prevalence among those non-disclosing showed considerable variations (Table 2). A global test of the interaction between disclosure status and sexual behavior groups in predicting UAVI did not reject the null hypothesis of no interaction, indicating that disclosure status effects do not vary by sexual behavior groups [$\chi^2(2) = 3.11$, $p = 0.21$].

Multivariate logistic regression. Table 3 describes the factors associated with UAVI. Serostatus disclosure emerged as a significant correlate of UAVI in the full sample [AOR = 0.09, 95% CI (0.02, 0.43), $p < 0.001$], such that participants who disclosed their HIV status had significantly lower odds of engaging in UAVI than those who withheld

TABLE 1. DESCRIPTIVE CHARACTERISTICS OF STUDY SAMPLE

	Full sample N = 242 n (%)	MSM N = 69 n (%)	MSW N = 68 n (%)	WSM N = 105 n (%)	ANOVA or χ^2
Serostatus disclosure	211 (88.7)	56 (81.2)	62 (92.5)	93 (91.2)	χ^2 (2) = 5.50
<i>Demographic characteristics</i>					
Age [<i>M</i> (<i>SD</i>)]	42.7 (8.9)	39.9 (9.6) ^a	44.5 (8.5) ^b	43.3 (8.2) ^b	<i>F</i> (2,239) = 5.47**
Race					
African American/black	172 (71.1)	40 (58.0) ^a	53 (77.9) ^b	79 (75.2)	χ^2 (2) = 8.21*
Caucasian/white	47 (19.4)	21 (30.4)	8 (11.8)	18 (17.2)	
Other	23 (9.5)	8 (11.6)	7 (10.3)	8 (7.6)	
Education					
High school or less	140 (57.9)	18 (26.1) ^a	52 (76.5) ^b	70 (66.7) ^b	χ^2 (2) = 41.57***
Some college or more	102 (42.1)	51 (73.9)	16 (23.5)	35 (33.3)	
Employment					
Not employed	151 (62.4)	36 (52.2)	46 (67.6)	69 (65.7)	χ^2 (2) = 4.53
Full or part-time	91 (37.6)	33 (47.8)	22 (32.4)	36 (34.3)	
<i>Clinical characteristics</i>					
Currently on ART	205 (84.7)	63 (91.3)	62 (91.2)	80 (76.2)	χ^2 (2) = 5.96
Undetectable viral load	133 (54.9)	40 (57.9)	38 (55.1)	55 (52.4)	χ^2 (2) = 0.53
Years since diagnosis [<i>M</i> (<i>SD</i>)]	9.5 (5.7)	8.3 (5.7)	10.4 (5.8)	9.6 (5.6)	<i>F</i> (2,235) = 2.32
<i>Substance use characteristics</i>					
Alcohol use	128 (53.1)	47 (68.1) ^a	42 (61.8) ^a	39 (37.5) ^b	χ^2 (2) = 13.51**
Marijuana use	42 (17.9)	10 (14.5)	17 (25.8)	15 (14.3)	χ^2 (2) = 3.89
Crack use	32 (13.6)	5 (7.3)	10 (15.2)	17 (16.2)	χ^2 (2) = 3.49
<i>Partner serostatus</i>					
HIV-positive	85 (35.1)	25 (36.2)	29 (42.7)	31 (29.5)	χ^2 (2) = 3.17
HIV-negative	119 (49.2)	29 (42.0)	32 (47.1)	58 (55.2)	χ^2 (2) = 3.07
Unknown	38 (15.7)	15 (21.7)	7 (10.3)	16 (15.2)	χ^2 (2) = 3.42

MSM, men who have sex with men. ANOVAs were used to test group differences on continuous variables; χ^2 tests were used to test group differences in dichotomous variables. Different superscripts within a row (^{a,b}) indicate significant differences ($p < 0.05$) between groups with Bonferroni-adjusted post-hoc tests. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

disclosure. Relative to women, MSM and MSW had lower odds of engaging in UAVI [AOR = 0.11, 95% CI (0.17, 0.82), $p < 0.05$ and AOR = 0.09, 95% CI (0.01, 1.45), $p = 0.09$, respectively]. In the adjusted analysis with confounding variables included, a global test of interaction between serostatus disclosure and sexual behavior group on unprotected sex showed no statistical significance (χ^2 (2) = 1.74, $p = 0.42$).

Discussion

While it is well established that openly communicating about sexual health issues with a partner can promote safer sexual decision-making, the relationship between sexual communication and safer sex practices may be more complex for PLHIV.⁴⁸ For all couples, sexual health communication may involve discussion of previous sexual partners or history of sexually transmitted infections. For those who are infected

with HIV, however, these conversations present substantial risk because they involve disclosure of a stigmatizing condition. For some HIV-infected individuals, practicing safer sex may actually provide a means to avert the need to communicate one's serostatus and avoid communicating about sexual health issues altogether. We sought to assess whether, among a diverse group of PLHIV, there was an association between serostatus disclosure and unprotected sex. MSM, MSW, and WSM did not differ in their reported serostatus disclosure. We found that participants who disclosed their HIV status were significantly less likely to engage in unprotected sex than those who did not disclose. We also found that, relative to women, MSM and MSW were less likely to report unprotected sex.

The disclosure processes model recognizes that for PLHIV communication affects dyadic outcomes like sexual behavior, but the exact direction and strength of this effect can

TABLE 2. PERCENT ENGAGING IN UAVI BY SEROSTATUS DISCLOSURE AND SEXUAL BEHAVIOR GROUP

Sexual behavioral group/disclosure group	MSM N = 69	Heterosexual men N = 67	Heterosexual women N = 102	Full sample N = 238
Disclosure	16.1	17.7	26.9	21.3
Nondisclosure	30.8	20.0	66.7	40.7
Combined disclosure/nondisclosure group	18.8	17.7	29.5	23.1

TABLE 3. MULTIVARIATE LOGISTIC REGRESSIONS MODELING UAVI

	AOR	(95% CI)
Disclosure	0.09**	(0.02, 0.43)
MSM	0.11*	(0.17, 0.82)
MSW	0.09 ⁺	(0.01, 1.45)
Disclosure x MSM	3.03	(0.36, 25.59)
Disclosure x MSW	5.63	(0.30, 12.26)
Age	0.94**	(0.90, 0.98)
Time since diagnosis	0.99	(0.94, 1.06)
Partner HIV serostatus ^a	0.21**	(0.09, 0.44)

UAVI, unprotected anal or vaginal sex. ^aReference group= seroconcordant partner. Final *n* for full sample in multivariate model=230 (66 MSM, 66 MSW, 98 WSM); ⁺*p*<0.10, **p*<0.05, ***p*<0.01.

depend on an individual’s goals in communicating one’s serostatus.²⁷ Since theoretical and empirical work suggests that members of different sexual behavior groups may differ in their goals regarding sexual communication, we sought to assess whether the protective effect of serostatus disclosure applied equally to all individuals or if it was specific to certain sexual behavior groups. Results of the current study provide evidence that the protective effects of serostatus disclosure may indeed apply equally: there were not significant differences in the relationship between disclosure and sexual risk behavior among the three groups we examined.

Our study showed evidence of an inverse association between disclosure and unprotected sex, consistent with previous research in this population^{37–40} and consistent with the disclosure processes model that suggests disclosure influences perceptions of risk. Some HIV-infected adults may consider disclosing their serostatus to be a means of transferring responsibility for HIV prevention efforts (e.g., condom use) to their partners. Partners who perceive HIV acquisition as less threatening may be more accepting of various risky sexual practices, including unprotected sex, while other partners may elect to practice safer sex.

Given the high prevalence of disclosure in our sample, it is also possible that participants used strategies that took into account partner serostatus and engaged in negotiation with their partners about the selection of other risk reduction strategies beyond condom use.⁴⁹ For example, participants may have adopted serosorting (i.e., choosing to have sex with a seroconcordant partner) or used seropositioning (i.e., taking on the receptive position during unprotected anal sex) as a protective behavior to reduce the risk of transmitting HIV. Since the use of seroadaptive strategies is dependent on serostatus disclosure,^{45,47} future interventions that involve negotiation of *both* serostatus disclosure and safer sex are warranted, particularly for those individuals with serodiscordant partners at risk of acquiring HIV.⁵¹

Nearly 60% of participants who withheld disclosure reported no instances of unprotected sex in the previous 3 months. Several possible explanations exist for this finding. First, some PLHIV may follow a disclosure/sexual behavior pattern of “uninformed protection,” believing that consistent condom use obviates the need for a discussion of each other’s serostatus.⁴⁶ These individuals may engage in protected sexual activity stemming from the HIV-infected individual’s

sense of personal responsibility to protect others, yet withhold disclosure to protect themselves from possible negative partner reactions. While the intent may be to practice safer sex on a consistent basis, this behavior may not always occur, particularly since the lifelong commitment to condom use may be challenged by “safe sex fatigue” over time.⁶ Furthermore, HIV serostatus disclosure to sexual partners does not guarantee engagement in protective behaviors to avoid transmission. In our sample, more than 20% of participants followed this disclosure/sexual behavior pattern termed “informed exposure.”⁴⁶ For some PLHIV and their partners, the shared decision-making for engagement in unprotected sexual activity does not hinge on disclosure. Finally, selecting partners who are known or assumed to be of the same HIV status in order to engage in unprotected sex (i.e., serosorting) may explain the “informed exposure” behavioral pattern observed in 20% of our sample.

Our findings suggest it could be beneficial for public health campaigns to encourage the general public to engage in more open sexual communication when entering new sexual relationships with discussions that emphasize not only condom use, but also asking partners about any history of sexually transmitted infections, including HIV. This “normalizing” of serostatus discussion could remove the burden completely from people living with HIV and hence reduce the barriers to sexual communication, including disclosure. Given the disproportionate expectation for and obligation of disclosure assigned to PLHIV rather than uninfected persons,¹⁹ future research and practice directions may consider the need for an improved understanding of mutual serostatus disclosure between partners regardless of HIV serostatus. By positioning the responsibility of serostatus disclosure exclusively on PLHIV, the risks of marginalization and stigmatization of this population, with their many negative consequences, is likely to continue.⁵² Furthermore, as PrEP begins to play a more pivotal role in an integrated HIV prevention strategy, its effectiveness relies on its acceptability, adoption, and sustainability particularly among high-risk individuals.^{53–55} Its success also hinges on mutual serostatus disclosure between sexually active partners so that HIV-negative partners are informed of the seropositivity of a partner and aware of their own HIV serostatus before they can make a decision to initiate PrEP.

Both practice and research implications of our findings are useful for developing future risk reduction interventions for PLHIV and their partners. Additional research, particularly more qualitative work, might help to identify motivations for having unprotected sex, as well as an understanding of the role that poor sexual communication or various risk perceptions may play, particularly in the absence of serostatus disclosure, for both HIV-infected individuals and their partners. Finally, intervention efforts for PLHIV should continue to include education about transmission risk behaviors, discussion of perceived risk for acquiring sexually transmitted infections, and effective risk reduction strategies for both partners regarding transmission of drug-resistant strains or other sexually transmitted infections.

Limitations

While our results highlight key points relevant to future interventions, it is important to consider our findings in light

of methodological limitations. Data on serostatus disclosure and unprotected sex, based as they often are on participant self-report without substantiation from partners, may be subject to recall and social desirability biases. We stressed participant confidentiality and used an ACASI to help minimize these biases^{56,57} but it is still possible that people over-reported disclosure and under-reported unprotected sexual activity. The question used to operationalize serostatus disclosure was purposely designed to be double-barreled, which participants could have misinterpreted. However, because we wanted to assess voluntary disclosure as opposed to inadvertent or ambiguous disclosure, such as accidentally leaving an HIV medication pill bottle in clear view, we believe this operationalization was appropriate for our purposes. In addition, we were not able to assess the timing of serostatus disclosure relative to sexual activity, since our data were collected at the partner, not at the sexual episode level. Future research could employ event-level analysis to more precisely measure serostatus disclosure relative to the timing of sexual activity. Length of sexual partnership was also not assessed for those participants reporting a primary partner. This may have been an unmeasured confounding factor in our analyses. The current sample, particularly MSM and MSW, was relatively small and it is possible that larger samples of these two separate groups of men would have contributed greater statistical power to detect statistically significant differences not observed in the current study. Finally, while our findings are applicable to PLHIV receiving HIV-related medical care, they may not be generalizable to individuals who are not in clinical care, who are unaware of their serostatus, or who report multiple sexual partners.

Conclusion

Our study contributes to the growing literature on unprotected sex among HIV-positive adults by considering the role of one aspect of sexual communication, specifically serostatus disclosure, among a diverse clinically representative sample of three distinct groups. The results are highly relevant to our understanding of the sexual risk behaviors occurring within the context of HIV-positive individuals' sexual partnerships. First, our results importantly suggest that most PLHIV who report one sexual partner disclosed to that individual. Second, disclosure is inversely associated with unprotected sex. Future strategies that aim to increase serostatus disclosure to sexual partners may consider focusing on its value as a means by which to reduce sexual risk behavior. Our findings support that to prevent forward transmission, we target not only serostatus disclosure among our interventions for PLHIV but also acknowledge the importance of safer sex behavior messages.

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