HIV Transmission Risk Behavior Among HIV-Positive Patients Receiving Antiretroviral Therapy in KwaZulu-Natal, South Africa

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Abstract

The aim of this investigation was to identify factors associated with HIV transmission risk behavior among HIV-positive women and men receiving antiretroviral therapy (ART) in KwaZulu-Natal, South Africa. Across 16 clinics, 1,890 HIV+ patients on ART completed a risk-focused audio computer-assisted self-interview upon enrolling in a prevention-with-positives intervention trial. Results demonstrated that 62 % of HIV-positive patients' recent unprotected sexual acts involved HIV-negative or HIV status unknown partners. For HIV-positive women, multivariable correlates of unprotected sex with HIV-negative or HIV status unknown partners were indicative of poor HIV prevention-related information and of sexual partnership-associated behavioral skills barriers. For HIV-positive men, multivariable correlates represented motivational barriers, characterized by negative condom attitudes and the experience of depressive symptomatology, as well as possible underlying information deficits. Findings suggest that interventions addressing gender-specific and culturally-relevant information, motivation, and behavioral skills barriers could help reduce HIV transmission risk behavior among HIV-positive South Africans.

Keywords

Introduction

South Africa is experiencing one of the world's most severe HIV epidemics. In 2011, an estimated 5.6 million South Africans were living with HIV, and nearly 400,000 became newly infected with the virus [1]. HIV incidence in South Africa is driven primarily by sexual contact between people living with HIV (PLWH) and uninfected others [2]. Although a growing number of South African PLWH are receiving antiretroviral therapy (ART) [3] and are exposed to clinic-based prevention messages, considerable proportions (14–46 % [4–6]) continue to engage in unprotected sex, and many are involved in serodiscordant sexual partnerships [6]. Despite the current drive towards "treatment as prevention [7]," given these rates of unsafe sex, and given that the infectivity of South African PLWH on ART remains a concern due to variable ART adherence [4, 8, 9] and documented virologic failure [8, 10–12], identifying determinants of HIV transmission risk behavior among this group has become increasingly crucial for HIV prevention in South Africa.

Few studies to date have examined correlates of unprotected sex among South African PLWH. Significant associations have been reported between PLWH's condom nonuse and

several risk factors, including alcohol/substance use, HIV stigma, HIV non-disclosure, and ART-related perceptions [4–6, 13–16]. Across these investigations, however, PLWH samples consisted primarily of non-ART populations, and risk outcomes focused almost exclusively on the occurrence of *any* unprotected sex, rather than on HIV transmission risk events in which PLWH engaged in unprotected sex with partners who were HIV-negative or of unknown HIV status. Furthermore, the research in this area has generally not been based on psychological theories of health behavior change, thus potentially complicating the translation of these findings to the development of effective behavioral interventions aimed at reducing risky sex among South African PLWH.

Given these limitations, the present investigation sought to identify socio-behavioral and HIV treatment-related correlates of unprotected sex involving HIV negative and HIV status unknown partners among a sample of female and male PLWH on ART in KwaZulu-Natal (KZN), South Africa. Our approach was guided by the information–motivation–behavioral skills (IMB) Model of HIV risk behavior [17, 18], and aimed to assess the extent to which HIV prevention-related knowledge and heuristics (information), condom use attitudes and social norms (motivation), and perceived ability to enact safer sex behaviors (behavioral skills) were associated with HIV transmission risk behavior. Furthermore, our work sought to extend the IMB model tests conducted by Kiene et al. [19] by employing a comprehensive, multivariable approach that examined factors that have been traditionally shown to contribute to sexual risk behavior (e.g., alcohol and substance use; depression), as well as potential gender- (e.g., victimization, empowerment) and culture-specific (e.g., seeking help for HIV from traditional healers) IMB-relevant factors that could serve as strong correlates of risk, particularly within the South African context.

Methods

HIV+ patients from 16 urban, peri-urban, and rural clinics in uMgungundlovu and uMkhanyakude districts of KZN were recruited between June 2008 and May 2010 for a prevention-with-positives intervention trial (*Izindlela Zokuphila/Options for Health*) [20]. uMgungundlovu and uMkhanyakude are among the South African districts hardest hit by HIV, with HIV prevalence among antenatal clinic attendees estimated at approximately 42 % [21]. Eligibility criteria included age 18 and receiving ART from a participating clinic. Additionally, an interviewer-delivered screener was administered to obtain a risk-stratified sample in which approximately 60 % (at study inception) had engaged in recent unprotected sex (i.e., sex without a condom in the past 4 weeks). Enrolled participants completed an audio computer-assisted self-interview (ACASI) in isiZulu or English at study baseline that assessed sexual behavior and potential correlates of risk. Participation was voluntary, and individuals received R70 (~US$10) for completing the ACASI.

All participants provided written consent. Study measures and procedures were developed through a collaborative effort involving researchers, South African PLWH, clinic staff, and community members, and were approved by ethics committees at the University of Connecticut (USA), University of KwaZulu-Natal (South Africa), and the Centre for Addiction and Mental Health (Canada). Approval was also obtained from the Research

Committee for the KZN Department of Health and the aforementioned District Health Offices.

Measures

Demographics—The ACASI assessed a set of diverse demographic factors, including age, race/ethnicity, highest level of education attained, and current employment status. Living situation was also queried through two items, which identified both the nature of the geographic area (i.e., urban/peri-urban/rural) and the type of dwelling (formal/informal structure) in which participants resided.

IMB Factors—The assessment of HIV prevention-related information, motivation, and behavioral skills factors has been described in detail by Kiene et al. [19]. Measures included an 11-item HIV transmission information scale (α = .69), a 13-item HIV risk-reduction motivation scale, with subscales assessing condom attitudes (α = .70), norms, (α = .66), perceived vulnerability (α = .69), and behavioral intentions (α = .67), and a 3-item safer sex behavioral skills scale (α = .68).

IMB-Relevant Socio-Behavioral Barriers to Safer Sex—A number of items asked participants about their partnerships and family situations, including the nature of relationship they were currently in (e.g., married, living with a partner, single/no partner, etc.), current efforts to conceive a child, the experience of actual or threatened physical abuse by a current partner, and disclosure of HIV status to sexual partners, to family members, and to friends. Additionally, abridged versions of validated scales assessed perceived power to use/negotiate condoms [22, 23] (3-items, α = .34) and HIV stigma [24] (7-items, α = .87), and two separate items assessed frequency of alcohol and substance use prior to sexual activity during the past 4 weeks.

Health and HIV Treatment-Related Factors—ACASI-delivered health-related measures included (1) the 10-item physical well-being subscale of the functional assessment of HIV infection (FAHI) [25] (α = .86); (2) an 11-item version of the Center for Epidemiologic Studies Depression (CESD) scale (α = .81), with scores 15 indicative of experiencing depressive symptomatology [26]; and (3) individual items assessing frequency of visits to clinics and to traditional healers. ART adherence was assessed through an interviewer-delivered ACTG-based measure [27], and HIV diagnosis and ART initiation dates, CD4 cell count, and HIV viral load were identified via clinic chart extraction.

Sexual Behavior—Measures adapted from Kiene et al. [5] assessed vaginal and anal sexual acts during the past 4 weeks. For each sexual partner (up to the last five), the partner's perceived serostatus (*Did this person test for HIV or not?: This person has tested HIV-positive/This person has tested HIV-negative/This person has not tested/I don't know if this person has tested*), and the number of vaginal and anal acts engaged in (total, protected), were assessed. Unprotected acts were calculated across HIV-negative and HIV status unknown partners and dichotomized to constitute the outcome measure, comparing participants who had engaged in any versus no unprotected acts with such partners during the past 4 weeks.

Statistical Analyses

Chi square and independent *t*-tests assessed differences in risk factors between sexually active men and women, and univariable logistic regression identified factors associated with the occurrence of unprotected sex involving HIV-negative or HIV status unknown partners for sexually active female and male samples. Within each sample, factors demonstrating univariable logistic associations at $p < .10$ significance were included in corresponding female and male multivariable logistic regression models. All analyses were performed using IBM SPSS Statistics v.19 [28].

Results

A total of 1,890 HIV+ patients (1,050 female, 840 male) completed an isiZulu (n = 1,884) or English (n = 6) ACASI at study baseline. From this sample, participants were excluded from the present analysis if they: (1) reported on the ACASI that they had not been sexually active (i.e., no vaginal or anal sex) within the past 4 weeks (237f, 180m); (2) did not answer ACASI sexual behavior items (34f, 27m); or (3) recorded double- or triple-digit ACASI sexual behavior responses that likely occurred from pressing touch screen buttons too long (e.g., "222" partners in the past 4 weeks) (17f, 17m). This resulted in a final sample of 1,378 (762f, 616m) for analysis.

Sample Characteristics

Demographic and risk-relevant factors among sexually active PLWH are shown in Table 1. Most participants (~96 %) identified as "Black-Zulu." Compared to men (Mean age 39.4), women were significantly younger (Mean age 34.1) ($p < .001$) and were less likely to be married or living with a partner (19.9 % of women vs. 29.1 % of men, $p < .001$). One in four women (25.3 %) reported experiencing actual or threatened physical abuse by a current partner; a proportion significantly higher than men (12.1 %) ($p < .001$). Approximately one in five participants (21.4 % of women, 18.5 % of men) reported <100 % ART adherence over the past 4 weeks, and just over a third (33.3 % of women, 34.8 % of men) had ever sought help for their HIV from a traditional healer. Clinic chart extraction yielded CD4 cell count and HIV viral load test results, which were limited to tests conducted within 90 days of a participant's ACASI, for 59.9 and 50.4 % of the sample, respectively. Data from these subsamples indicated that approximately one in four participants (23.9 %) had a detectable HIV viral load (21.8 % of women, 26.6 % of men) and that 28.5 % had a CD4 cell count <200; with CD4 cell counts <200 being significantly more common among men (38.5 %) than women (20.6 %) ($p < .001$).

Sexual Behavior: Past 4 Weeks

As shown in Table 1, in accord with risk screening procedures, most sexually active participants engaged in unprotected sex during the past 4 weeks (78.9 % of women, 65.6 % of men; $p < .001$), with 46.9 % of women and 35.4 % of men reporting that they had engaged in unprotected sex with an HIV-negative or HIV status unknown partner ($p < .001$). Sexually active participants reported a total of 3,850 unprotected acts within the past 4 weeks, 2,397 (62.3 %) of which involved HIV-negative and HIV status unknown partners.

Correlates of Unprotected Sexual Behavior

Univariable logistic regression identified significant associations between a diversity of risk factors and having unprotected sex with an HIV-negative or HIV status unknown partner [see Table 2 (women) and Table 3 (men)]. Based on these associations, multivariable logistic regression demonstrated that among sexually active HIV-positive women, correlates of having unprotected sex with an HIV-negative or HIV status unknown partner were indicative of possessing relatively poorer HIV prevention-related information and of being in challenging partnerships, characterized by low perceived power, experiencing actual or threatened physical abuse by a partner, non-disclosure of HIV to one's partner, and being unmarried or not living with one's partner (see Table 2). Among sexually active HIV-positive men, significant multivariable correlates of unprotected sex with an HIV-negative or HIV status unknown partner included possessing relatively more negative attitudes toward condoms, experiencing depressive symptomatology, seeking help for their HIV from traditional healers, poorer ART adherence, and younger age (see Table 3).

Discussion

In our risk-stratified sample of South African PLWH on ART, the majority of participants who engaged in unprotected sex did so with an HIV-negative or HIV status unknown partner, and over 60 % of all reported unprotected acts occurred within such partnerships. This remains concerning even within the context of "treatment as prevention [7]" as detectable HIV viral loads and imperfect ART adherence were not uncommon in our sample.

From an IMB model perspective, our findings demonstrate that among both female and male HIV-positive samples, information, motivation, and behavioral skills related factors were found to significantly predict unprotected sex involving HIV-negative and HIV status unknown partners at the univariable level, and a number of these factors remained as significant correlates of risky behavior in multivariable analyses. For sexually active female PLWH, risk factors were indicative of deficits in HIV prevention-related information, and of partnerships in which physical abuse, low perceived power, less established relationships, and a lack of disclosure may serve as formidable behavioral skills challenges and barriers to safer sex efforts. Intimate partner violence and diminished power have frequently been associated with unprotected sex among non-infected South African women [29–33], and our findings suggest these barriers persist for HIV-positive women on ART, even though they may have more access to counseling that can assist with such challenges. Furthermore, although women in our sample received guidance regarding disclosure prior to initiating ART [34, 35], our findings suggest that disclosure to sexual partners remains problematic for some HIV-positive women; potentially complicating safer sex negotiation and decreasing the likelihood of condom use [6, 36–38], particularly with HIV-negative and HIV status unknown partners [15].

Among sexually active male PLWH, negative condom attitudes were independently associated with unprotected sex involving HIV negative and HIV status unknown partners, suggesting an important personal motivation barrier to enacting safer sexual behaviors within such partnerships. In addition, unprotected sex with an HIV-negative or HIV status

unknown partner was more likely among men reporting greater depressive symptomatology. Feeling depressed may result in diminished self-regulation or the desire for "cognitive escape [39, 40]," and as suggested by the IMB model [18], it can in and of itself have a demotivating impact on one's safer sex-related decisions. Other significant factors for men included seeking help for their HIV from traditional healers and reporting imperfect ART adherence. These factors may possibly be indicative of an information deficit that stems from a broad, underlying perception regarding traditional medicine, HIV treatment, and HIV transmissibility [41], which could impact one's belief in the necessity of using condoms with potentially uninfected partners. Additional research would be required, however, to identify the exact mechanisms in this regard.

Findings should be viewed in terms of potential study limitations. First, because the study design was cross-sectional, definitive statements cannot be made regarding causality of the reported associations. Second, our recruitment procedures prioritized "risky" PLWH on ART, with a focus on obtaining a sample in which approximately 60 % of the total sample had reported engaging in unprotected sex within the past 4 weeks. As such, our study sample was sexually "riskier" than South African PLWH in general, and in particular, South African PLWH on ART, which possibly limits the generalizability of our findings. Third, results are based on self-report measures, and although ACASI can reduce socially desirable responding [42, 43], risky sex accounts may still have been subject to some reporting bias. Fourth, partner serostatus was based on participants' perceptions rather than on documented HIV test results. Fifth, viral load test results within 90 days of ACASI were not available for half of our sample, hindering our ability to conduct sub-analyses limited to PLWH with detectable viral loads.

These limitations, however, do not lessen the importance of the findings of this study, which involved a large-scale sample of PLWH from regions where the HIV epidemic is at its worst, and which is the first to identify a comprehensive, theoretically-based set of risk factors associated with unprotected sex involving HIV-negative and HIV status unknown partners specifically among South African PLWH receiving ART. Our findings can help inform the development of IMB model-based HIV prevention efforts that target this population, and suggest that for female PLWH, interventions should focus not only on providing accurate HIV transmission risk information, but also on addressing substantial behavioral skills barriers inherent in the challenging partnership situations described above. This could be accomplished by promoting empowerment [32, 33, 44], improving skills for disclosure [15], building partner trust [38], and bolstering social support [45]. For male PLWH, prevention strategies should focus on increasing motivation to engage in safer sex through the promotion of positive attitudes toward condoms, possibly by both clinic-based personnel and traditional healers [46, 47], and on identifying and treating depression. With an increasing number of HIV-positive South Africans entering clinical care and initiating ART, our findings suggest that IMB model-based behavioral prevention strategies that target PLWH on ART and that complement treatment as prevention approaches will be crucial for curtailing the spread of HIV in South Africa.

Acknowledgments

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Table 1

Characteristics of sexually active HIV-positive women and men

	Women (n = 762) n (%)	Men (n = 616) n (%)	*t* or χ^2	*p*
Age (M, SD)	34.1 (7.2)	39.4 (9.1)	11.78	<.001
Race/ethnicity				
Black-Zulu	736 (96.8 %)	589 (95.8 %)	1.13	.952
Black-Xhosa	9 (1.2 %)	10 (1.6 %)		
Black-another race	11 (1.4 %)	12 (2.0 %)		
Indian	1 (0.1 %)	1 (0.2 %)		
Coloured	1 (0.1 %)	2 (0.3 %)		
Other	1 (0.1 %)	1 (0.2 %)		
Education				
No schooling	80 (10.5 %)	104 (16.9 %)	20.68	<.001
Class1/GR1-STD7/GR9	309 (40.7 %)	275 (44.7 %)		
STD8/GR10-STD10/Matric/N3/GR12	361 (47.5 %)	232 (37.7 %)		
Post-secondary	10 (1.3 %)	4 (0.7 %)		
Employment and income				
Currently unemployed	549 (72.0 %)	385 (62.5 %)	14.22	<.001
Household income <R1500/Month (~US $200)	538 (71.1 %)	394 (64.3 %)	7.19	.007
Relationship and family				
Married or living with a partner	151 (19.9 %)	179 (29.1 %)	15.76	<.001
Have one or more children	688 (90.3 %)	538 (87.3 %)	3.02	.082
Currently trying to have a baby	220 (28.9 %)	190 (30.9 %)	0.64	.423
Threatened or actual physical abuse by a partner	192 (25.3 %)	74 (12.1 %)	38.12	<.001
Housing				
Housing location = rural	512 (67.2 %)	383 (62.3 %)	3.61	.057
Dwelling type = informal	416 (54.7 %)	326 (52.9 %)	0.42	.519
HIV diagnosis and treatment				
Months since HIV diagnosis (M, SD)	35.8 (25.8)	31.7 (22.4)	2.70	.007
CD4 Count <200	95 (20.6 %)	140 (38.5 %)	31.83	<.001
HIV viral load = detectable	85 (21.8 %)	81 (26.6 %)	2.21	.137
Months on ART (M, SD)	20.5 (14.9)	19.2 (13.8)	1.54	.123
<100 % ART adherence—past 3 days	41 (5.5 %)	15 (2.5 %)	7.64	.006
<100 % ART adherence—past 4 weeks	162 (21.4 %)	112 (18.5 %)	1.83	.177
Sought help for HIV from a traditional healer	254 (33.3 %)	214 (34.8 %)	0.33	.569
Self-reported physical and mental health				
FAHI-physical health (possible range = 0–40) (M, SD)	26.79 (7.80)	29.13 (8.03)	5.43	<.001
Depressed (modified CESD)	170 (23.2 %)	126 (20.9 %)	0.99	.321
Disclosure of HIV serostatus				
To family member	728 (95.5 %)	578 (93.8 %)	2.00	.157
To sexual partner	643 (84.5 %)	527 (85.7 %)	0.54	.536

	Women (n = 762) n (%)	Men (n = 616) n (%)	t or χ²	p
Information–motivation–behavioral skills factors				
Information—total score (possible range = 0–14)	7.09 (2.20)	6.92 (2.22)	1.38	.167
Condom-related attitudes (M, SD) (possible range = 1–5)	3.67 (0.91)	3.44 (0.97)	4.57	<.001
Condom use norms (M, SD) (possible range = 1–5)	3.23 (0.70)	3.37 (0.69)	3.81	<.001
Behavioral skills (M, SD) (possible range = 1–5)	3.27 (1.01)	3.40 (1.07)	2.35	.019
Behavioral intentions (M, SD) (possible range = 1–5)	4.22 (0.72)	4.18 (0.85)	1.01	.312
Alcohol and substance use within sexual contexts				
Alcohol use prior to sex—past 4 weeks	85 (11.2 %)	197 (32.0 %)	90.54	<.001
Substance use prior to sex—past 4 weeks	29 (3.8 %)	77 (12.5 %)	36.26	<.001
Sexual behavior (i.e., vaginal and anal sex)—Past 4 weeks				
Number of partners (M, SD)	1.07 (0.27)	1.17 (0.46)	4.77	<.001
Number of sexual acts (M, SD)	4.04 (10.42)	4.43 (6.05)	0.83	.406
Engaged in unprotected sex[a]	601 (78.9 %)	404 (65.6 %)	30.46	<.001
Number of unprotected sexual acts (M, SD)	2.87 (10.24)	2.70 (5.92)	0.36	.719
Engaged in unprotected sex with an HIV-negative or HIV status unknown partner[a]	357 (46.9 %)	218 (35.4 %)	18.40	<.001
Number of unprotected sexual acts with HIV-negative and HIV status unknown partners (M, SD)	1.92 (10.17)	1.52 (5.30)	0.88	.380

Percentages are based on the number of participants who indicated a specific response divided by the number of participants who responded to the item in question

[a]In our sample, although a significantly greater proportion of women than men reported engaging in unprotected sex, this difference was the result of recruitment procedures, and therefore does not imply that female PLWH on ART are riskier than male PLWH on ART

Table 2

Factors associated with unprotected sex involving an HIV-negative or HIV status unknown partner among sexually active HIV-positive women (n = 762): univariable and multivariable logistic regression

Factor	Had unprotected sex with an HIV-negative or HIV status unknown partner		OR (95 % CI)	p	AOR (95 % CI)	p
	No (n = 405) n (%)	Yes (n = 357) n (%)				
Currently employed	103 (25.4 %)	110 (30.8 %)	1.31 (0.95–1.79)	.099	1.21 (0.84–1.74)	.302
Married or living with a partner	96 (23.8 %)	55 (15.4 %)	0.59 (0.41–0.85)	.004	0.63 (0.42–0.95)	.028
Threatened or actual physical abuse by a partner	81 (20.1 %)	111 (31.2 %)	1.80 (1.29–2.51)	<.001	1.80 (1.23–2.64)	.002
Non-disclosure of HIV to sex partners	37 (9.2 %)	81 (22.7 %)	2.91 (1.91–4.43)	<.001	2.56 (1.60–4.08)	<.001
HIV-related information (M, SD)	7.4 (2.1)	6.7 (2.3)	0.86 (0.81–0.92)	<.001	0.90 (0.83–0.97)	.007
Condom attitudes (M, SD)	3.8 (0.9)	3.6 (0.9)	0.82 (0.70–0.96)	.012	1.01 (0.82–1.24)	.948
Condom use norms (M, SD)	3.3 (0.7)	3.2 (0.7)	0.77 (0.63–0.96)	.019	0.91 (0.71–1.15)	.414
Behavioral skills (M, SD)	3.4 (1.0)	3.2 (1.0)	0.83 (0.72–0.96)	.011	1.02 (0.85–1.21)	.894
Perceived power (M, SD)	3.6 (0.8)	3.3 (0.8)	0.62 (0.52–0.74)	<.001	0.69 (0.55–0.87)	.002

Percentages are based on the number of participants who indicated a specific response divided by the number of participants who responded to the item in question

Table 3

Factors associated with unprotected sex involving an HIV-negative or HIV Status unknown partner among sexually active HIV-positive men (n = 616): univariable and multivariable logistic regression

Factor	Had unprotected sex with an HIV-negative or HIV status unknown partner		OR (95 % CI)	p	AOR (95 % CI)	p
	No (n = 398) n (%)	Yes (n = 218) n (%)				
Age <30	29 (7.3 %)	34 (15.7 %)	2.36 (1.40–3.99)	0.001	2.27 (1.23–4.17)	0.009
Have one or more children	356 (89.4 %)	182 (83.5 %)	0.60 (0.37–0.96)	0.035	0.71 (0.40–1.25)	0.229
Currently trying to have a baby	112 (28.2 %)	78 (35.8 %)	1.42 (1.00–2.02)	0.052	1.10 (0.72–1.68)	0.653
Threatened or actual physical abuse by a partner	39 (9.8 %)	25 (16.1 %)	1.77 (1.08–2.88)	0.023	0.99 (0.53–1.83)	0.967
<100 % 4-week ART adherence	61 (15.6 %)	51 (23.7 %)	1.69 (1.11–2.56)	0.014	1.66 (1.03–2.68)	0.037
FAHI-physical health (M, SD)	29.6 (7.7)	28.2 (8.6)	0.98 (0.96–1.00)	0.029	1.00 (0.98–1.03)	0.81
CESD-depressed	66 (16.9 %)	60 (28.2 %)	1.93 (1.29–2.87)	0.001	1.71 (1.01–2.88)	0.046
Sought help for HIV from a traditional healer	117 (29.5 %)	97 (44.5 %)	1.92 (1.36–2.70)	<.001	1.55 (1.03–2.35)	0.037
Clinic visits 1 ×/month or more often	379 (95.7 %)	196 (89.9 %)	0.40 (0.21–0.77)	0.006	0.54 (0.26–1.13)	0.101
Non-disclosure of HIV to sex partners	44 (11.1 %)	44 (20.2 %)	2.03 (1.29–3.20)	0.002	1.60 (0.95–2.71)	0.077
HIV-related information (M, SD)	7.1 (2.1)	6.5 (2.3)	0.88 (0.81–0.95)	0.001	0.95 (0.86–1.04)	0.275
Condom attitudes (M, SD)	3.6 (0.9)	3.2 (1.0)	0.64 (0.54–0.76)	<.001	0.73 (0.57–0.93)	0.012
Condom use norms (M, SD)	3.4 (0.7)	3.2 (0.7)	0.66 (0.52–0.84)	0.001	0.76 (0.55–1.05)	0.097
Behavioral intentions (M, SD)	4.2 (0.8)	4.1 (0.8)	0.78 (0.65–0.95)	0.013	1.16 (0.87–1.55)	0.307
Behavioral skills (M, SD)	3.5 (1.1)	3.3 (1.1)	0.82 (0.70–0.96)	0.011	1.05 (0.85–1.29)	0.654
HIV-related stigma (M, SD)	2.8 (1.0)	3.0 (1.1)	1.25 (1.06–1.48)	0.008	1.07 (0.87–1.31)	0.544
Perceived power (M, SD)	3.6 (0.9)	3.3 (0.9)	0.64 (0.52–0.77)	<.001	0.80 (0.61–1.04)	0.089

Percentages are based on the number of participants who indicated a specific response divided by the number of participants who responded to the item in question