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HIV Stigma and Unprotected Sex among PLWH in KwaZulu-Natal, South Africa: A Longitudinal Exploration of Mediating Mechanisms

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Abstract

Social and structural factors including HIV stigma are theorized to drive global disparities in HIV prevalence. This study tests whether HIV self-stigma, or experiences of stigma at the individual level, is associated with engagement in unprotected sex among PLWH in KwaZulu-Natal, South Africa, where 37.4% of adults are living with HIV compared with 0.8% worldwide. It further explores whether depressive symptoms, HIV status disclosure to sex partners, and/or condom use attitudes mediate potential associations between HIV self-stigma and unprotected sex.

Participants, including 924 PLWH, were recruited from primary care clinics and completed baseline, 6-, 12-, and 18- month survey assessments between 2008 and 2011. Hierarchical linear modeling analyses were used to examine longitudinal within-subjects associations between HIV self-stigma, mediators, and unprotected sex with both HIV-negative/unknown and HIV-positive partners. Results demonstrate that HIV self-stigma was prospectively associated with greater likelihood of unprotected sex with HIV-negative/unknown partners. None of the variables explored significantly mediated this association. HIV self-stigma was also prospectively associated with greater likelihood of unprotected sex with HIV-positive partners via the mediators of greater depressive symptoms and more negative condom use attitudes. The current study suggests that HIV self-stigma undermines HIV secondary prevention and care efforts among PLWH in KwaZulu-Natal. It is therefore critical to address HIV stigma at the social/structural

level to reduce HIV self-stigma at the individual level and ultimately curb global disparities in HIV prevalence. In the absence of widespread social/structural change, interventions that treat depressive symptoms and encourage more positive condom use attitudes despite the existence of HIV stigma may buffer associations between HIV self-stigma and unprotected sex with HIV-positive partners among PLWH in KwaZulu-Natal.

Keywords

depressive symptoms; disclosure; HIV; stigma; unprotected sex; South Africa

Introduction

In the province of KwaZulu-Natal, South Africa the global disparity in HIV prevalence is stark with 37.4% of adults living with HIV compared with 0.8% of adults worldwide (National Department of Health, 2008; UNAIDS, 2012). Social and structural factors including gender role norms, violence, migration, distance to HIV services, and stigma shape HIV risk environments and contribute to global HIV disparities (Ackerman & de Klerk, 2002; Andersson, Cockcroft, & Shea, 2008; Booyesen, 2004; Jewkes & Morrell, 2010; Rhodes et al., 2005). Of these factors, stigma has received attention as a particularly important barrier to HIV prevention and care in South Africa and elsewhere (UNAIDS 2002; Holzemer & Uys, 2004). HIV public stigma (also referred to as societal stigma) is social devaluation and discrediting associated with HIV (Goffman, 1963; Bos, Pryor, Reeder & Stutterheim, 2013). HIV public stigma is pervasive in African countries including South Africa, where it is manifested at the structural level and shapes cultural, economic, political, legal, policy, and healthcare environments (Holzemer et al., 2007; Ndinda et al., 2007).

Knowledge of associations between HIV stigma and unprotected sex among people living with HIV (PLWH) in KwaZulu-Natal is critical to understand whether this particular social factor contributes to HIV prevalence in this context that is heavily burdened by HIV. In addition to being manifested at the structural level, public HIV stigma is manifested at the individual level as HIV self-stigma (Bos et al., 2013). That is, PLWH experience HIV self-stigma, which involves experiences of discrimination from others, anticipation of discrimination from others, and internalization of devaluation or reduced self-worth. In the current study, we aim to determine whether HIV self-stigma is prospectively associated with unprotected sex with HIV-negative/status unknown and/or HIV-positive partners among PLWH. Further, in the absence of immediate social and structural change effectively eradicating public HIV stigma and its manifestations at the structural level (Rhodes et al., 2005; Gupta, Parkhurst, Ogden, Aggleton, & Mahal, 2008), understanding the processes which mediate potential associations between HIV self-stigma and unprotected sex among PLWH is critical to inform more targeted HIV secondary prevention and care efforts in KwaZulu-Natal. Therefore, we further aim to identify mediational processes through which HIV self-stigma may relate to unprotected sex among PLWH. We draw on longitudinal data collected in KwaZulu-Natal to reach these aims.

Evidence regarding associations between HIV self-stigma and unprotected sex largely comes from studies conducted in Western contexts. Although results have been mixed (Courtenay-Quirk, Wolitski, Parsons, & Gómez, 2006; Fields et al., 2013; Venable, Carey, Blair, & Littlewood, 2006), recent work suggests that self-stigma is associated with unprotected sex among PLWH with both HIV-negative/unknown (Hatzenbuehler, O’Cleirigh, Mayer, Mimiaga, & Safren, 2011) and HIV-positive (Fields et al., 2013) partners.

If HIV self-stigma is associated with unprotected sex among PLWH in KwaZulu-Natal, then depressive symptoms, HIV status disclosure, and/or condom use attitudes may mediate this association. First, evidence demonstrates that HIV self-stigma is associated with greater depressive symptoms among PLWH (Hatzenbuehler et al., 2011; Logie & Gadalla, 2009). Some work suggests that depressive symptoms, in turn, are associated with unprotected sex (Clement, 1992; Kelly et al., 1993; Lehrer, Shrier, Gotmaker, & Buka, 2006). Second, PLWH who have experienced HIV self-stigma may be less likely to disclose their HIV status to sex partners (Chaudoir, Fisher, & Simoni, 2011). Several studies demonstrate that HIV self-stigma is associated with a decreased likelihood of disclosure of HIV status to sex partners (Kingori et al., 2012; Overstreet, Earnshaw, Kalichman, & Quinn, 2012; Simbayi et al., 2006). Some, but not all, studies further find an association between status disclosure and unprotected sex (Crepaz & Marks, 2002). Third, HIV self-stigma may impact PLWH’s attitudes toward condom use. PLWH may feel worse about navigating condom use within sexual interactions particularly if they have experienced discrimination from sexual partners. Although the association between HIV self-stigma and condom use attitudes is understudied, a robust body of evidence suggests that attitudes toward condoms play a role in promoting actual condom use (Reid & Aiken, 2011; Sacco, Levine, Reed, & Thompson, 1991).

In the current study, we examine whether HIV self-stigma is prospectively associated with unprotected sex with HIV-negative/status unknown and/or HIV-positive partners, and further test whether depressive symptoms, HIV status disclosure, and/or condom use attitudes mediate these associations in KwaZulu-Natal.

Methods

Procedure and participants

Data for this study are drawn from a randomized control trial evaluating the efficacy of *Options for Health*, a secondary HIV prevention intervention conducted between 2008 and 2011 (Cornman et al., 2008, 2011). Study sites included 16 primary care clinics located in uMgungundlovu and uMkhanyakude Districts in KwaZulu-Natal, South Africa. Clinic patients were eligible to participate in the study if they were 18 years of age or older, HIV-positive, on antiretroviral therapy, and cognitively able to participate in research. Interested patients who met these criteria were referred by staff clinicians to an onsite research assistant. The research assistant obtained consent from patients and screened them for their HIV transmission risk behavior. For purposes of statistical power, approximately 60% of patients chosen for enrollment in the study were “risky” (i.e., reporting one or more unprotected sex acts in the past four weeks) and 40% were “non-risky” (i.e., reporting no

unprotected sex acts in the past four weeks). Institutional review boards in South Africa, the United States, and Canada approved research procedures.

In total, 1890 participants were enrolled in the study and completed baseline, 6-, 12-, and 18-month assessments in Zulu using an audio computer-assisted self-interview (ACASI) or with an interviewer. Data for the current analyses are drawn from assessments completed by 924 control participants. On average, control participants were 37.25 ($SD = 9.02$) years old. The majority of participants were female (55.5%), identified as Black, Zulu (93.5%), were unemployed (71.1%), lived in a rural area (66.8%), and had a relationship partner (i.e., single with partner, engaged, or married; 75.9%).

Measures

Participants completed measures to assess the following constructs at each time point.

Unprotected sex with HIV-negative/unknown or HIV-positive partners—

Participants self-reported whether they had sex in the last four weeks and their number of partners. They were then asked to report additional data for up to five of their last sexual partners including the number of vaginal/anal acts with each partner, the number of times condoms were used for these acts with each partner, and each partner's perceived HIV-serostatus. Unprotected sex was defined as vaginal or anal sex without a condom. Participants were dichotomized into those who reported not having any unprotected sex with a HIV-negative/unknown partner (0) versus those who reported having unprotected sex with at least one HIV-negative/unknown partner (1) in the last four weeks. They were also dichotomized into those who reported not having any unprotected sex with an HIV-positive partner (0) versus those who reported having unprotected sex with at least one HIV-positive partner (1) in the last four weeks (Kiene et al., 2013; Shuper et al., in press). Of the total sex acts reported, 19.7% involved unprotected sex with a HIV-negative/unknown partner and 20.7% involved unprotected sex with a HIV-positive partner.

HIV self-stigma—HIV self-stigma was measured using a scale developed for the current study. This scale was informed by the AIDS-Related Stigma Scale (Kalichman et al., 2005), the only HIV stigma scale that had been validated within South Africa at the time of study design in 2005. Items were adapted and pilot tested to measure HIV self-stigma among PLWH in KwaZulu-Natal. New items were generated based on experiences described by PLWH during focus groups. The resulting scale included seven items, including: "I feel embarrassed because I have HIV," "I feel like I am not a good person because I have HIV," "Since I learned that I have HIV, I feel like I am isolated from the rest of the community," "Since I got HIV, I see that people in the community have deserted me," "Some people who know that I have HIV have grown more distant," "Since I got HIV, I worry about people discriminating against me," and "I worry that people will judge me as a bad person if they know that I have HIV." Participants were asked the extent to which they agreed with items on a Likert-type scale ranging from *Strongly Agree* (1) to *Strongly Disagree* (5). Items were scored so that higher scores indicated more stigma, and then averaged to create a composite. The measure demonstrated strong reliability in the current sample at each assessment

(Cronbach's $\alpha=0.88-0.91$). The mean self-stigma score across participants and time points was 2.74 ($SD=1.06$).

Depressive symptoms—Depressive symptoms were measured using 11 items from the Center for Epidemiologic Studies Depression Scale [CES-D (Radloff, 1977)]. Participants were asked how frequently they experienced depressive symptoms within the past week on a scale from *Rarely or none of the time, less than 1 day* (0) to *Most or all of the time, 5-7 days* (3). Scores were summed (Cronbach's $\alpha=0.70-0.73$). The mean depressive symptoms score across participants and time points was 9.21 ($SD=4.41$).

HIV status disclosure to sex partners—Participants were asked “Have you told anyone you have had sex with that you are HIV-positive?” Responses were coded as *no* (0) or *yes* (1). Across participants and time points, 84.2% of responses were yes.

Condom use attitudes—Participants were asked two questions, including: “For me, always using a condom during sex is&” and “For me, trying to persuade people I have sex with to use a condom is&” Responses were assessed using a bi-polar adjective scale, a common form of attitude measurement (Olson & Zanna, 1993). This allows participants to align their personal attitudes along a continuum ranging from negative attitudes, *Very bad* (1), to positive attitudes, *Very good* (5). Items were averaged (Cronbach's $\alpha = 0.77 - 0.79$), yielding a single condom use attitudes score. The mean condom use attitudes score across participants and time points was 3.87 ($SD=0.96$).

Statistical analyses

We primarily employed within-subjects, regression-based longitudinal analyses to evaluate study aims. First, all over time data were transposed into long format (i.e., each construct is represented by one variable containing values for all time points) and lagged versions of variables were created. Lagged versions include values of the previous time point of variables (except for baseline given that data prior to baseline do not exist). Next, hierarchical linear modeling analyses controlling for clustering by site were conducted using PROC MIXED in SAS 9.3. Lagged versions of independent variables were used to predict outcome variables to determine whether independent variables were associated with prospective scores on dependent variables. Lagged versions of outcome variables were controlled for along with socio-demographic characteristics (i.e., gender, age, ethnicity, employment, residence location, and relationship status). Finally, statistical significance of mediation was examined using Baron and Kenny's steps (Baron & Kenny, 1986) and the revised critical value of the Sobel's test (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

Results

First, direct associations between self-stigma and prospective unprotected sex were examined (Table 1, Step 1). Lagged self-stigma scores were directly associated with increased likelihood of unprotected sex with HIV-negative/unknown partners but not HIV-positive partners. Given that an indirect effect can exist between variables even if a direct effect does not exist (MacKinnon & Fairchild, 2009), we proceeded with testing for

evidence of mediation of the association between self-stigma and unprotected sex with HIV-positive partners in addition to HIV-negative/unknown partners. Next, associations between self-stigma and prospective scores on the mediators were examined (Table 1, Step 2). Controlling for socio-demographic characteristics and lagged scores on the mediators, lagged self-stigma scores were associated with increased depressive symptoms and more negative condom use attitudes but not disclosure to sex partners.

Finally, associations between the mediators and prospective unprotected sex were examined (Table 1, Steps 3-4). Lagged depressive symptoms and lagged disclosure to sex partners had marginally statistically significant associations with unprotected sex with HIV-negative/unknown partners. Lagged depressive symptoms, lagged disclosure to sex partners, and lagged condom use attitudes were all associated with unprotected sex with HIV-positive partners. Results of the Sobel tests (Table 2), interpreted with the revised critical value, suggest that depressive symptoms were a marginally statistically significant mediator of the association between self-stigma and unprotected sex with HIV-negative/unknown partners. Depressive symptoms and condom use attitudes were statistically significant mediators of the association between self-stigma and unprotected sex with HIV-positive partners.

Discussion

The current study demonstrates that HIV self-stigma is prospectively associated with greater likelihood of unprotected sex with both HIV-negative/unknown and HIV-positive partners among PLWH in KwaZulu-Natal, South Africa. We found a direct association between HIV self-stigma and unprotected sex with HIV-negative/unknown partners. We found an indirect, or mediated, association between HIV self-stigma and unprotected sex with HIV-positive partners: HIV self-stigma was associated with greater depressive symptoms and more negative condom use attitudes, which in turn were associated with greater likelihood of unprotected sex with HIV-positive partners. These findings provide evidence that HIV stigma, which has been theorized to play a key role in global HIV disparities, may contribute to HIV transmission. It further suggests that HIV stigma may contribute to STI transmission between PLWH. In these ways, HIV stigma may undermine both HIV prevention and care efforts in KwaZulu-Natal.

Strengths, limitations, and future directions

Much of the past work on HIV self-stigma and sexual risk behavior among PLWH has been conducted in Western contexts. We explored these processes using data drawn from a large sample of PLWH in KwaZulu-Natal, where stark HIV disparities persist. It is critical to understand barriers to HIV prevention and treatment among PLWH within this context to best tailor culturally relevant HIV secondary prevention and care efforts. Additionally, the current study draws on strong methodology to help clarify past mixed results on these relationships. We tested within-subjects associations between HIV self-stigma, mediators, and unprotected sex over a time-period of 18 months and demonstrated that HIV self-stigma is associated with prospective unprotected sex with both HIV-negative/unknown and HIV-positive partners. We also controlled for outcomes to demonstrate the effects of self-stigma above and beyond past scores on outcome variables. The longitudinal design paired with

these statistical methods enables firmer conclusions regarding the direction of effects between variables than would be possible from a cross-sectional study. These results are consistent with other longitudinal work on self-stigma and unprotected sex among PLWH (Hatzenbuehler et al., 2011).

Despite these strengths, the current study has several limitations. HIV self-stigma was measured using a scale developed for the current study. Although this self-stigma scale contains items similar to items included in other self-stigma measures (Berger, Ferrans, & Lashley, 2001; Fife & Wright, 2000; Herek, Saha, & Burack, 2013; Sayles et al., 2008) and demonstrated good reliability in the current study, it is important that future research evaluate its validity and reliability. The study is further limited by its measurement of disclosure to sex partners. Future work might employ more nuanced measures of disclosure that better capture timing, recipient, and other processes relevant to self-stigma and disclosure (e.g., those described by Chaudoir et al., 2011). Additionally, participants who reported not having sex at one time point (3.9-4.4% of the sample across time points) were included in analyses given that they may have had sex at a different time point. Supplementary analyses suggested that including these participants in analyses did not alter results; however, future research among larger samples may examine these associations exclusively among participants who report having sex.

This study identified mediators of the association between HIV self-stigma and unprotected sex with HIV-positive partners only. Future work should continue to explore the processes linking HIV self-stigma with unprotected sex with HIV-negative/unknown partners among PLWH. Research should also explore reasons why mediating mechanisms linking HIV self-stigma with unprotected sex may differ with HIV-positive versus HIV-negative partners. In addition, future research should examine how other social and structural factors (e.g., gender role norms, violence) affect associations observed in the current study to inform broad multi-level approaches to HIV secondary prevention and care efforts in KwaZulu-Natal.

Finally, access to antiretroviral therapy has significantly expanded since the beginning of this study. It increased from 37% to 52% between 2009 and 2011 in South Africa (Day & Gray, 2013), and continues to climb. Evidence suggests that increased access to antiretroviral therapy can reduce self-stigma, potentially by normalizing HIV (Roura et al., 2009). We therefore hypothesize that mean levels of HIV self-stigma may be lower among PLWH in KwaZulu-Natal today than at the time of data collection for this study. Given that associations between self-stigma and unprotected sex have been found in other contexts (Fields et al., 2013; Hatzenbuehler et al., 2011), we further hypothesize self-stigma remains associated with unprotected sex. Future research should continue to study self-stigma among PLWH as the social context in KwaZulu-Natal evolves.

Implications and conclusions

This study has implications for secondary prevention and care efforts involving PLWH in KwaZulu-Natal. Results suggest that HIV self-stigma plays a role in unprotected sex among PLWH, which can result in the potential transmission of HIV and other STIs to HIV-negative partners as well as the acquisition of STIs by PLWH. It is therefore important to reduce self-stigma and enhance resilience to stigma among PLWH. As examples,

interventions may focus on increasing social support among PLWH and enhancing adaptive coping strategies to enhance resilience to stigma (Earnshaw, Bogart, Dovidio, & Williams, 2013). Further, interventions that screen for and treat depressive symptoms and promote more positive condom use attitudes may decrease risky sexual behavior with HIV-positive partners despite experiences of HIV self-stigma. It is critical that researchers seek ways to buffer PLWH from the negative effects of HIV self-stigma to protect the health of both PLWH and their sex partners.

Additionally, we must continue to develop and evaluate interventions to reduce HIV stigma at the structural level given that structural stigma supports and facilitates self-stigma. Structural HIV stigma interventions are becoming increasingly popular (Stangl, Lloyd, Brady, Holland, & Baral, 2013), and may seek to eliminate stigma within legal, political, economic, and healthcare policies in KwaZulu-Natal. Addressing HIV stigma at the structural and individual levels may ultimately reduce public HIV stigma (Bos et al., 2013), and contribute to diminished global HIV disparities.

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Table 1

Regression Analyses, Including B(SE)

	Step 1		Step 2		Steps 3-4		
	Unprotected Sex with HIV-/? Partners	Unprotected Sex with HIV+ Partners	Depressive Symptoms	Disclosure to Sex Partners	Condom Use Attitude	Unprotected Sex with HIV-/? Partners	Unprotected Sex with HIV+ Partners
Self-Stigma Lagged	0.02 (0.01) *	0.01 (0.01)	0.45 (0.56) **	0.01 (0.01)	-0.04 (0.02) *	0.01 (0.01)	-0.01 (0.01)
Unprotected Sex with HIV-/? Partners Lagged	0.26 (0.02) **	0.06 (0.02) **				0.25 (0.02) ***	0.04 (0.02) *
Unprotected Sex with HIV+ Partners Lagged	0.01 (0.02)	0.30 (0.02) **				0.01 (0.02)	0.30 (0.02) **
Depressive Symptoms Lagged			0.47 (0.02) **	-0.01(0.01)	-0.01 (0.01)	0.01 (0.01) [†]	0.01 (0.01) *
Disclosure to Sex Partners Lagged			-0.10 (0.20)	0.47 (0.02) **	0.15 (0.05) **	-0.03 (0.02) [†]	0.05 (0.02) **
Condom Use Attitude Lagged			-0.13 (0.09) [†]	0.01 (0.01)	0.49 (0.02) **	-0.01 (0.01)	-0.03 (0.01) **

Note: All analyses controlled for gender, age, ethnicity, employment status, residential area, and relationship status. "HIV-/?" represents HIV-negative/unknown, and "HIV+" represents HIV-positive.

[†] p<0.10;

* p<0.05;

** p<0.01.

Table 2

Results of Mediation Tests, Including Sobel's Test Statistic (SE)

	Unprotected Sex with HIV- Partner	Unprotected Sex with HIV+ Partner
Depressive Symptoms	1.56 (0.01) [†]	1.86 (0.01) [*]
Disclosure to Sex Partner	-0.33 (0.01)	-0.33 (0.01)
Condom Use Attitude	1.28 (0.01)	1.89 (0.01) [*]

Note: "HIV-/?" represents HIV-negative/unknown, and "HIV+" represents HIV-positive.

[†]
p 0.10;

^{*}
p 0.05.