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Pathways from sexual stigma to incident HIV and sexually transmitted infections among Nigerian men who have sex with men

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Abstract

Objectives—Sexual stigma affecting men who have sex with men (MSM) in Nigeria may be an important driver of HIV and other sexually transmitted infections (STIs), but potential mechanisms through which this occurs are not well understood. This study assessed the contributions of suicidal ideation and sexual risk behaviors to causal pathways between stigma and HIV/STIs.

Design—Data were collected from the TRUST/RV368 Study, a prospective cohort of 1,480 MSM from Abuja and Lagos, Nigeria.

Methods—Participants enrolled from March 2013–February 2016 were classified into three stigma subgroups based on a latent class analysis of nine stigma indicators. Path analysis was used

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Contributions

MC, SB, and IO designed the study. RN and BK collected and managed data. CRH, RN, MC and DG conceived the analyses. CRH analyzed data with input from RM, RN, DG, MC, and SB. CRH, DG, RN, SB, and MC drafted the manuscript and RM, TC, HL, and OG provided critical review and editing. All authors have seen and approved the paper.

The TRUST/RV368 Study Group is constituted as follows:

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to test a model where disclosure led to stigma, then suicidal ideation, then condomless sex with casual sex partners, and finally incident HIV infection and/or newly diagnosed STIs, adjusting the model for age, education, having had female sex partners in the past 12 months, and sex position. Both direct and indirect (mediational) paths were tested for significance and analyses were clustered by city.

Results—As stigma increased in severity, the proportion of incident HIV/STI infections increased in a dose-response relationship (low: 10.6%, medium: 14.2%, high 19.0%, p -value=.008). All direct relationships in the model were significant and suicidal ideation and condomless sex partially mediated the association between stigma and incident HIV/STI infection.

Conclusions—These findings highlight the importance of the meaningful integration of stigma-mitigation strategies in conjunction with mental health services as part of a broader strategy to reduce STI and HIV acquisitions among Nigerian MSM.

Keywords

Men who have sex with men; stigma; path analysis; HIV infections; sexually transmitted infections; incidence

Introduction

Sexual stigma is the co-occurrence of the following four components within a power imbalance: labeling, stereotyping, separation, and status loss and discrimination specific to sexual minorities due to same-sex practices.[1] Although sexual stigma has been found to be associated with HIV prevalence and with avoidance of seeking health care,[2,3] it remains unknown whether sexual stigma drives onward transmission of HIV and sexually transmitted infections (STIs) among Nigerian men who have sex with men (MSM). Psychological processes resulting from sexual stigma may maintain or exacerbate poor mental health, ultimately influencing behaviors that put MSM at risk of new infections.[5–7] Understanding the mental health processes in these pathways may allow an intervention point to prevent further transmission.

A number of studies have shown a direct relationship between sexual stigma and suicidal ideation[4–7] and there is growing evidence that suicidal ideation is a significant problem for MSM across sub-Saharan Africa (SSA).[8–10] Suicidal ideation is often associated with cognitive processes including hopelessness, pessimism, negative self-perceptions, and poor problem-solving skills that may hinder protective health behavior.[11,12]

Sexual stigma has also been found to be associated with condomless sex among MSM across a variety of settings outside of Nigeria.[13–16] This relationship may be mediated by psychological processes that include distress, anxiety, depressive symptoms and suicidality. [4,15,17] Individuals experiencing poor mental health as a result of sexual stigma may use condoms less frequently because of lowered self-esteem,[18,19] feelings of hopelessness or fatalism,[20–23] a need for validation or emotional contact,[22,24] and sexual sensation seeking.[18] Each of these may become barriers to the development of positive attitudes and intentions that foster protective behavior.

Very few studies have linked sexual stigma to HIV/STIs by way of both mental health and sexual risk behavior and studies assessing sexual stigma's association with HIV and STIs have used prevalence.[25–27] For the studies that have looked at mental health as a mediator, none evaluated suicidal ideation. Therefore, the objectives of this study were to assess: 1) if sexual stigma towards Nigerian MSM is associated with incident HIV/STI infection and 2) if the sexual stigma-HIV/STI acquisition association is mediated by suicidal ideation and condomless sex.

Methods

Study Design

The TRUST/RV368 study utilizes respondent driven sampling (RDS) to recruit MSM into a prospective cohort at two sites in Nigeria as previously described.[28,29] Eligibility criteria included male sex assigned at birth and at least 16 years of age in Abuja or 18 years in Lagos. All participants provide written informed consent and approval for the study was obtained by the Federal Capital Territory Health Research Ethics Committee, the University of Maryland Baltimore Institutional Review Board (IRB), and the Walter Reed Army Institute of Research IRB.

From March 2013 to February 2016, 1,480 participants completed a baseline questionnaire and were provided with HIV testing and counselling using a parallel algorithm of Determine® (Alere, Waltham, MA, USA) and Uni-gold® (Trinity Biotech, Co-Wicklow, Ireland), with STAT-PAK (Chembio, NY, USA) as the tie-breaker, upon enrollment and every three months thereafter. Urine and rectal swab specimens were tested for *Chlamydia trachomatis* (CT) and *Neisseria gonorrhoea* (GC) using the Aptima Combo 2® assay (Hologic, Bedford, MA, USA) every three months. Incident infections were defined by a first positive diagnosis after a previously negative diagnosis and subsequently censored. The proportion of individuals with an incident HIV and/or STI infection were pooled as a composite measure for the outcome variable. Variables other than HIV and STIs included in the analysis were assessed only at study enrollment: ever experienced sexual stigma, ever disclosed same-sex practices to family, ever experienced suicidal ideation, condomless sex with casual sex partners in the past 12 months (vs. inconsistent condom use or no sexual acts with casual sex partners). Analyses were conducted using STATA Version 13 (Statacorp, College Station, TX) and MPlus Version 7.4.[30]

Analyses

Creation of three stigma subgroups—Nine sexual stigma indicators were chosen that are representative of stigma prevalent in the US, Western Africa, and Southern Africa.[31] and were utilized to create three latent stigma classes using latent class analysis (LCA). The nine questions asking about stigma as a result of having sex with men included: family made discriminatory remarks, rejection from friends, refusal from police to protect them, verbal harassment, blackmail, physical violence, rape, fear of seeking health care and fear of walking in public. The analyses were conducted using modal class.[32] Thus, the latent stigma class variable was converted into a manifest variable with three categories of low (n=633), medium (n=663), and high (n=184) stigma.

Bivariate associations—Chi-square goodness of fit testing was used to determine if the proportions of the following variables differed by stigma subgroup: disclosure of same-sex practices, suicidal ideation, condomless sex, and incident HIV/STI infection.

Mediation Model—Path analysis is a form of structural equation modeling that is recommended when researchers have hypotheses regarding causal associations between measured variables. A strength of this analysis is that it allows the inclusion of multiple mediators and outcomes, testing direct and indirect effects, and assessing model fit.[33] We tested whether a sexual stigma-HIV/STI incidence association was partially mediated by suicidal ideation and condomless sex, adjusting for disclosure of same-sex practices, age, education, having had a female sex partners in the past 12 months, and sex position (insertive, receptive, both). A test of whether a larger model (with the direct association between stigma and HIV/STI acquisition included) was a better fit than a smaller model (without the direct association) was conducted using a robust chi-square model difference test.[30] The path analysis produced standardized probit regression estimates. A positive coefficient means that an increase in the predictor leads to an increase in the predicted probability. A negative coefficient means that an increase in the predictor leads to a decrease in the predicted probability. The model was clustered by city using a sandwich procedure that calculates robust errors.[30] Model fit was assessed using the following standard criteria: χ^2 goodness-of-fit test p -value>.05, Root Mean Square Error of Approximation (RMSEA)<.05, Comparative Fit Index (CFI)>.90, and Tucker-Lewis Index (TLI) >.90.

Results

The sample consisted of participants who were primarily under 25 years of age (60%), had completed high school or less education (70%), identified their gender as male (82%), had never disclosed their same-sex practices to a family member (83%), engaged in both insertive and receptive anal sex with male partners in the past 12 months (53%), and approximately half had a female sex partner in the past 12 months. Bivariate analysis revealed that increasing sexual stigma was associated with increasing incident HIV and/or STI infections in a dose response association (low: 10.6%, medium: 14.2%, high 19.0%, p -value=.008) (Figure 1).

The larger model with a direct relationship between stigma and HIV/STI acquisition in addition to the indirect associations had a better fit than the smaller model (p <.001). Figure 2 presents the final path model. The model had good fit across all fit statistics (χ^2 p -value= .387, RMSEA=.007, CFI=.998, and TLI=.996). There was a significant total effect of stigma on HIV/STI acquisition, standardized estimate .159, standard error (SE) .047, p -value =.001 (standardized estimate of direct effect .152, SE .047, p -value =.001; standardized estimate of indirect effect .006, SE .001, p -value <.001).

Discussion

The path analysis model revealed that MSM who were in higher stigma classes at baseline were more likely to contract HIV/STIs over the course of the study, and this was partially explained by stigma's association with suicidal ideation, suicidal ideation's association with

condomless sex with casual sex partners, and condomless sex's association with HIV/STI acquisition. The current study extends the literature by assessing newly acquired infections rather than existing infections (i.e. prevalence) and identifies mediating processes that partially help to explain the association between stigma and HIV/STI acquisition. The direct association between stigma and incident HIV/STI infection remained significant in the model, suggesting the existence of other unmeasured factors that need further exploration.

The levels of suicidal ideation found in this sample were much higher for all stigma classes as compared to the prevalence estimates in a nationally representative sample of Nigerian adults (3.2% with a third subsequently attempting suicide).[34] The proportion reporting suicidal ideation among the low stigma class alone was 5.3 times that of the nationally representative sample. Suicidal ideation is predictive of suicide, one of the leading causes of death worldwide.[35] Therefore, our findings highlight the need to incorporate mental health issues of MSM in HIV and STI programming in Nigeria. One option would be to adopt WHO's Mental Health Gap Action Programme (mhGAP) intervention, that addresses mental, neurological and substance use disorders with trauma-informed care approaches, within non-stigmatizing venues that serve MSM.[36]

Addressing poor mental health is also important for preventing sexual behavior that increases the risk of HIV and STIs. Hatzenbuehler's psychological mediation framework posits that sexual stigma causes or exacerbates poor mental health through psychological processes, such as hopelessness.[37] Intervention strategies that counteract psychological processes associated with suicidal ideation could include: 1) improving problem solving skills and appraisal to bolster feelings of control and self-worth;[38] 2) organizing peer support groups that are available to counsel MSM clients to alleviate feelings of social isolation and loneliness;[39] and 3) adapting cognitive behavioral therapy interventions successful in high-income settings at reducing condomless sex among MSM to the Nigerian context.[40–43]

There are several limitations with these analyses. The LCA that produced the three stigma classes had moderate entropy, which means that some people may have been misclassified. [44] The analyses could have been strengthened by indicators of internalized stigma and other measures of mental health, such as depressive and anxiety symptoms, but which were not collected in the cohort. Our sample size for incident HIV infection was small, limiting our ability to assess the model for HIV and STI separately. Several variables in the model were asked as lifetime experiences, making the temporal ordering unclear and causality difficult to establish. It is possible that stigma did not precede suicidal ideation or condomless sex for some participants. Lastly, the methodology precluded accounting for variation in observation time for different participants and for potential variability in the model variables following enrollment.

Rarely have studies included robust measures of new infections collected from an MSM cohort and explicated a pathway by which to understand how sexual stigma may promote onward transmission of HIV/STIs. These findings call for a meaningful integration of stigma mitigation strategies, mental health services, and psychosocial support as a standard of care, as well as including resiliency-based strategies to build self-efficacy. Together these

strategies will minimize deficits in problem-solving skills and overcome feelings of hopelessness among Nigerian MSM.

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Figure 1.

Direct associations between stigma classes and other variables in the mediation model in a sample of Nigeria men who have sex with men.

Footnote: Differences are significant at $p < .05$ for all variables except condomless sex. Suicidal ideation is missing 4 and condomless sex with casual partners is missing 3.

Figure 2.

Path analysis of the association between sexual stigma and incident HIV and/or sexually transmitted infection among a sample of Nigerian men who have sex with men: standardized regression estimates and standard errors.

Footnote: Participant characteristics not pictured that were also adjusted for and which retained their significance at $p < .05$ include: age, education, having female sex partners in the past 12 months, and sex position for stigma; sex position for suicidal ideation; and education and having female sex partners in the past 12 months for condomless sex.