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Multiple Dimensions of Stigma and Health Related Factors Among Young Black Men Who Have Sex with Men

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Abstract

This study is among the first to examine the association between multiple domains of HIV-related stigma and health-related correlates including viral load and medication adherence among young Black men who have sex with men (N = 92). Individual logistic regressions were done to examine the hypothesized relationships between HIV-related stigma and various health and psychosocial outcomes. In addition to examining total stigma, we also examined four domains of HIV stigma. Findings revealed the various domains of stigma had differential effects on health-related outcomes. Individuals who reported higher levels of total stigma and personalized stigma were less likely to be virally suppressed (OR 0.96, 95 % CI 0.91–1.00 and OR 0.50, 95 % CI 0.25–1.02, respectively). Concerns about public attitudes toward HIV were positively related to medication adherence (OR 2.18, 95 % CI 1.20–3.94) and psychological distress (OR 5.02, 95 % CI 1.54–16.34). The various domains of HIV stigma differentially affected health and psychosocial outcomes, and our findings suggest that some forms of HIV stigma may significantly affect viral load and medication adherence among this population. Stigma-informed approaches to care and treatment are needed, along with incorporated psychological and social supports.

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Compliance with Ethical Standards

Ethical Approval All policies and procedures in this study were reviewed and approved by the Institutional Review Board at the University of Chicago. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent We received written informed consent from all participants in this study.

Conflict of Interest The authors of this study have no conflicts of interest to disclose.

Keywords

HIV; Young Black MSM; Stigma; Health outcomes

Nationwide, HIV rates among non-Hispanic Black men who have sex with men (YBMSM) ages 15–29 are three and five times higher than their Latino and White counterparts, respectively [1]. Although Black teenagers ages 13–19 make up just 17 % of adolescents in the US, Black teens and young adults, ages 13–24, represent more than half (57 %) of all new HIV infections in that age group [2]. Between 2006 and 2009, there was a 48 % increase in HIV incidence among YBMSM ages 13–29 [3], made even more noteworthy given the unchanged incidence rates among Latino and White MSM in the same age cohort [3]. These stark racial disparities exist at every step of the HIV care continuum as Black Americans, particularly YBMSM, are less likely to know their HIV status, be engaged in HIV care, and less likely to be virally suppressed than are their White counterparts [4]. Given these stark racial disparities, it is important to identify factors that may contribute to these disparities in treatment in order to improve long-term health outcomes and reduce disparities.

One societal-level factor that has received increasing attention for its role in HIV disparities is stigma. According to the national HIV/AIDS strategy, HIV stigma is an impediment to HIV care and treatment and reducing stigma is a necessary aspect of reducing HIV-related disparities [5]. Much of the research on stigma is based on the work of sociologist Erving Goffman, who conceptualized stigma as the social identification and disapproval of a physical, behavioral, or social trait, which often manifests in marginalization or discrimination [6]. Stigma is best understood in relation to the social and structural conditions and institutions that contribute to social exclusion and disapproval [7], as it represents broad social processes and power relations [8]. This is particularly important in understanding how stigma functions within the context of HIV/AIDS. HIV stigma is a construct explaining the negative social attitudes toward people living with HIV/AIDS, typically manifested in acts of discrimination aimed at people living with HIV, as well as the internalization of negative feelings and beliefs experienced by people living with HIV/AIDS [9]. Although overt institutionally-sanctioned discrimination against individuals with HIV/AIDS has reduced drastically since the start of the epidemic, the negative perceptions of individuals with HIV and the stigma surrounding the disease remains an important social issue to explore [10, 11].

HIV stigma and discrimination are known barriers to engagement in care for people living with HIV [12, 13]. In a study of HIV-positive adolescents, half of the participants reported skipping medication to avoid disclosure of HIV status to friends and family [14]. Stigma has also been associated with apprehension about participating in HIV prevention initiatives and HIV testing [15]. For example, HIV stigma is associated with never receiving an HIV test and failure to participate in HIV prevention efforts [16], which can lead to HIV-positive individuals unknowingly transmitting the virus to sexual partners [17]. Furthermore, longitudinal research with a sample of predominantly White MSM living with HIV demonstrated that perceptions of HIV-related stigma were positively associated with sexual

behaviors that increase risk for HIV transmission and may place MSM at greater risk for other sexually transmitted infections [18].

In addition to being negatively associated with HIV testing and treatment, perceptions of HIV stigma are associated with poor social and psychological health. For example, HIV stigma is associated with increased symptoms of depression and anxiety, as well as decreased self-esteem [19–21] although such factors have been understudied in YBMSM. In turn, this psychological distress is associated with higher rates of participation in sexual and substance use risk behaviors [20, 22] and decreased adherence to antiretrovirals [14, 23]. HIV stigma also can contribute to social isolation [24] and prevent HIV-infected individuals from acquiring positive social support systems [25]. Lack of supportive social relationships, coupled with the internalization of HIV stigma, can contribute to increased substance use, psychological health concerns, and disengagement with the health care system among adolescents [26–28].

Young adults living with HIV may be especially vulnerable to HIV stigma and may face additional challenges that affect how HIV stigma influences their quality of life and health care [7, 29]. In addition to not being as developmentally able to process and positively cope with experiences of stigma and discrimination as adults, young adults may not have the breadth or quality of social support and resources that might be available to HIV-infected adults [30]. Furthermore, the consequences of stigma may be amplified for Black individuals who are more likely to live in communities in which HIV stigma is more prevalent than it is in other racial and ethnic communities [31]. Furthermore, the effects of stigma may be particularly relevant for Black MSM, for whom their race and sexual identity or behaviors present co-occurring stigmatizing identities [32]. For example, YBMSM have reported experiencing racism from the White gay community and struggling with the intersection of stigma and discrimination due to the intersection of their sexual orientation and race [33–35]. Black MSM may also be contending with cultural norms about masculinity and traditional family structure [36, 37], and may feel the need to hide their sexual orientation within the Black community due to perceived homonegativity and the perceived potential loss of major support systems [38–40].

Yet, with few exceptions [19, 25, 41], empirical attention to HIV stigma among YBMSM living with HIV has been limited, which represents a significant gap given the pervasiveness of HIV stigma and the continued racial and age disparities in the HIV Continuum of Care [25, 41]. The present study helps to address these gaps and adds to the literature by exploring how multiple dimensions of stigma are associated with a spectrum of health-related behaviors and outcomes, including viral load and medication adherence. In so doing, we examined total stigma, as well as HIV stigma related to disclosure of HIV status, personalized stigma, public attitudes, and negative self-image. The examination of the association between stigma and medication adherence is especially important for helping to understand and address disparities along the HIV care continuum for YBMSM. We hypothesized that higher levels of stigma would be associated with decreased medication adherence and viral load, higher levels of psychological distress, and increased sexual risk behaviors.

Methods

Data were collected between October 2012 and November 2014 as part of the baseline assessment from Project nGage, a preliminary efficacy randomized control. Project nGage was developed to explore the role of natural social support in improving HIV care for young Black men who have sex with men (YBMSM). HIV-infected YBMSM ages 16–29 who had successfully linked to care were randomized to the intervention or a control arm consisting of treatment as usual, which included routine case management. The intervention included the identification and engagement of a youth-identified support confidant to help promote adherence to HIV primary care. Two face-to-face meetings with a social work interventionist, as well as 11 brief booster sessions delivered via telephone and text messaging, provided support confidants with information on the importance of HIV care and ARV adherence and helped the dyad create a personalized care and support plan to increase or sustain HIV medical care. Study design and intervention details are described in more depth elsewhere [42]. Participants were recruited at two study sites; a university hospital and a federally qualified health center. Eligibility included being born biologically male, self-identifying as Black or African American, between the ages of 16 and 29, inclusive, having an HIV diagnosis for greater than 3 months, and having disclosed their status to at least one person in their close social network. Two transgender women were included in the sample but excluded from these analyses given their limited sample. Baseline interviews were conducted on laptop computers by research assistants who read survey questions aloud and recorded participant responses in REDCap [43]. Participants received \$25 for completing the baseline and each follow-up survey. Viral loads were retrieved from patient charts. All study protocol and procedures were approved by the University of Chicago Institutional Review Board.

Measures

Demographic Variables

Participants reported their current gender identity, race, age and sexual orientation. Participants were asked about the highest level of education or schooling and current employment status.

Independent Variable

HIV Stigma—Stigma was measured using the abbreviated HIV stigma scale, which has been validated among HIV-infected youth [44], and demonstrated good internal consistency in our sample (Cronbach's $\alpha = 0.715$). Conceptually, HIV stigma consists of four domains [44]: disclosure concerns, public attitudes toward HIV, personalized stigma measuring consequences of other people knowing one's status, and negative self-image including feelings of shame, guilt, and not being as good as others [45]. The total stigma scale contained 10 items and four internal subscales reflecting these domains. Each item was rated on a four-point Likert scale from "strongly disagree" to "strongly agree."

Dependent Variables

Medication Adherence and Viral Load—Adherence levels of 90–95 % are crucial to the success of antiretroviral therapy [46] and optimal virologic success declines significantly in patients taking fewer than 95 % of prescribed doses [47]. To assess medication adherence, participants were asked whether they were currently taking HIV antiretroviral medications. Response categories were “Not prescribed yet, meds prescribed but haven’t picked up yet; meds prescribed but don’t want to take them, meds prescribed, but haven’t been into the clinic; and other.” Those who reported being on HIV medications were asked: “What percent, from 0 to 100, did you take your medication as prescribed in the last 30 days? Zero percent time would mean ‘none of the time’, ‘50% time indicated’, ‘half of the time’, and ‘100%’ indicated all of the time.” In this study, adherence was dichotomized as those taking their medication between 95 and 100 % of the time and those taking their medication less than 95 % of the time. Most recent viral load was retrieved from patient charts. Individuals were considered virally suppressed if their HIV viral load was less than 200 copies/ml.

Psychological Distress—Psychological distress was measured using the brief symptom inventory-18 scale, which assess global severity index (GSI), a cumulative measure of psychological distress [48]. Each item was rated on a five-point Likert scale ranging from “not at all” to “extremely”. The raw GSI score was computed taking the mean of all item scores. Raw scores were converted to T-scores and a participant was considered to experience psychological distress if $T > 62$. The psychological distress variable was transformed into a dichotomous variable with a T-score of 62 as the cutoff point [49]. The psychological distress scale demonstrated sound internal consistency (Cronbach’s $\alpha = 0.853$).

Sexual Risk—Condomless anal intercourse (CAI) was assessed by asking “Have you had unprotected anal sex with a male partner of unknown or different HIV-status in the past six months” (yes/no). We also examined the use of drugs to facilitate sex by a single item: “Have you ever used any substances as a ‘sex drug’, that is to make sex easier, better, last longer, or something similar?” (yes/no). Participants who answered positively then identified which drugs they had used. We also assessed the use of sex drugs by a sexual partner: “As far as you know, have any of your sex partners ever used any ‘sex drugs’?” (yes/no). If the sexual partners had used sex drugs, the respondent was asked to specify the drug used. Given the frequency with which marijuana was used as a sex drug compared to other drugs, we limited our analyses to whether individuals or their partners had ever used marijuana as a sex drug.

Statistical Analyses

Exploratory analyses were conducted using SPSS, version 22.0 (IBM, Chicago, IL). Univariate analyses were used to examine demographic and primary study variables of interest. Mean and standard deviation was computed for continuous variables. Raw scores for the stigma and psychological distress scales were converted to T-scores. Cronbach’s α , mean, and standard deviation were calculated for the total HIV stigma scale and the four domains within the scale. Multiple logistic regressions were conducted to examine the hypothesized relationships between stigma and the various sexual, psychological and clinical

health outcomes. In addition to examining how an individual's total stigma score was associated with each outcome, we also examined how each stigma subscale was associated with the dependent variables of interest, thereby allowing us to gain perspectives on how various dimensions of stigma were related to important indicators of health and the HIV care continuum among YBMSM living with HIV. All regressions controlled for the effects of age, education level, and intervention effects. Additionally, viral load regressions controlled for the effects of medication adherence. Odds ratios and 95 % confidence intervals are reported. Given the exploratory nature of the study and the sample size, we calculated $p < 0.10$.

Results

Sample Characteristics

The sample included 92 YBMSM. As indicated in Table 1, participants ranged in age from 18 to 29 with an average age of 23.9 (SD = 2.90). Over 90 % of participants had a high school diploma or greater and two-thirds were working either full- or part-time. Psychological distress was evident among 12 (13 %) participants. Current HIV medication use was reported by 63 (68.5 %) participants in the last 30 days. Among participants taking antiretroviral medication, 41 (45 %) reported taking their medication at least 95 % of the time in the past 30 days.

HIV Stigma

As indicated in Table 2, the mean total score on the stigma scale was 23.36 (SD = 5.19), which is consistent with previous work examining stigma among a diverse sample of adolescents [19]. Total stigma and three of the four stigma domains demonstrated reliability. The HIV disclosure subscale ($\alpha = 0.287$) had very low reliability, which has been reported in similar studies with HIV-positive youth [50]. However, given that the two items measuring disclosure were the most strongly endorsed among this sample, we decided to further explore HIV disclosure concerns in regression analyses. Nearly 90 % of the sample agreed or strongly agreed with the item, "I am very careful who I tell that I have HIV." It should be noted that disclosure to at least one person in their social network was part of the eligibility criteria. Thus, although participants noted concerns about disclosure, they had all disclosed to at least one person.

HIV Stigma and Sexual, Psychological and Clinical Health Outcomes

Separate logistic regression analyses were conducted to explore the relationship between various domains of HIV-related stigma and various sexual, psychological and clinical health outcomes. Controlling for the effects of age, education level, and intervention effects, Table 3 presents the findings of multiple logistic regressions. Initially, we conducted analyses to examine how HIV stigma, most broadly, predicts various health and psychosocial outcomes. As hypothesized, total stigma was positively associated with feelings of psychological distress (OR 1.10, 95 % CI 1.02–1.18) and negatively associated with HIV viral suppression (OR 0.96, 95 % CI 0.91–1.00); participants experiencing greater levels of stigma had significantly lower odds of being virally suppressed.

We then conducted regression analyses to examine the extent to which the individual domains of stigma predicted sexual, psychological, and clinical health outcomes. Personalized stigma was significantly associated with viral suppression, such that one unit increase in reported experiences of personalized stigma predicted a 0.50 decrease in the odds of being virally suppressed (95 % CI 0.25–1.02). Personalized stigma was also a significant predictor of CAI (OR 2.19, 95 % CI 1.05–4.57) and having a partner use marijuana as a sex drug (OR 2.24, 95 % CI 1.11–4.53). Similarly, negative self-image predicted use of marijuana as a sex drug (OR 2.28, 95 % CI 1.17–4.44) and partner use of marijuana as a sex drug (OR 1.97, 95 % CI 0.99–3.90). Negative self-image was also a significant predictor of psychological distress (OR 2.95, 95 % CI 1.20–7.26). Concerns about public attitudes toward HIV was the only stigma domain related to medication adherence, with a one unit increase in perceptions of negative public views about individuals with HIV being associated with a 2.18 increase in the odds of reporting 95 % or greater adherence to HIV medications (95 % CI 1.20–3.94). Concerns about public attitudes toward HIV were also a significant predictor of psychological distress (OR 5.02, 95 % CI 1.54–16.34). HIV disclosure was not associated with any of the examined outcomes.

Discussion

This study is among the first to examine the domains of HIV stigma and sexual, psychological, and clinical health indicators among YBMSM living with HIV. Our findings are consistent with recent research that found HIV-positive YBMSM frequently experience discriminatory treatment, ostracism, and unwanted status disclosure [51, 52]. Yet, despite its prevalence, few studies have examined stigma and its relationship to sexual, psychological, and clinical health outcomes among YBMSM across a single sample. This study aimed to fill those gaps and offer important insights into the complex effects of stigma.

Our findings demonstrated that various domains of stigma differentially affect health and psychosocial outcomes among YBMSM. For example, although we hypothesized all domains of stigma would be associated with decreased medication adherence and decreased viral load, our results suggest some aspects of stigma may be more influential on health outcomes than others. Two previous studies explored the relationship between HIV stigma and viral load, although one was with a primarily White sample of adults [23] and the other was with a small sample (N = 40) of adolescents [41]. Contrary to our findings, neither of these studies found a relationship between HIV stigma and viral load. In this study, total stigma and personalized stigma were significantly and negatively related to viral suppression. The mechanisms linking stigma and viral suppression are unclear, especially given that contrary to our hypotheses and previous studies [23, 32, 53], total stigma was not significantly related to medication adherence.

Interestingly, and contrary to our hypotheses, the public attitudes domain was positively associated with medication adherence, indicating that stronger perceptions that people will react negatively to people living with HIV was associated with a higher likelihood of achieving optimal medication adherence. In previous work with a similar population, individuals who had begun taking antiretroviral medication had higher levels of total HIV stigma, a relationship hypothesized to be due to the daily reminder of their HIV imposed by

taking daily antiretrovirals [41]. It may seem counterintuitive that findings revealed a positive association between stigma and medication adherence and yet a negative association with viral suppression, given that higher levels of adherence generally reduce viral load. Yet, it is important to note that different domains of stigma were associated with medication adherence and viral suppression, again highlighting the importance of unpacking how stigma manifests in the lives of YBMSM. Initiation of, and adherence to antiretroviral medication, may present unique challenges for YBMSM, including potential increases in HIV stigma. However, longitudinal research is needed to better understand the temporal ordering of these relationships. In addition, it also is possible that participants overreported their medication adherence or were subject to outside attitudes or social desirability. Additional research is needed to understand self-reported medication adherence among YBMSM and future research might benefit from assessing medication adherence using ecological momentary assessment [54] combined with objective adherence measures [55].

In addition to health outcomes, we explored the effects of stigma on sexual risk behaviors, hypothesizing that stigma would predict greater CAI and use of marijuana as a sex drug. Consistent with previous research demonstrating a relationship between HIV stigma and drug use among Latino MSM [56], total stigma, personalized stigma, and negative self-image were positively associated with self or partner use of marijuana as a sex drug. Previous work has identified high rates of marijuana use among Black MSM, although a smaller percentage report using marijuana as a sex drug. [57]. This has significant implications for HIV and STI risk, as use of marijuana as a sex drug is associated with condomless sex and group sex among Black MSM [57]. Thus, self and partner use of marijuana as a sex drug can contribute to increased risk for both partners. The context in which sex drugs are used deserve increased attention. For example, increased sensation seeking has been found to account for some of the relationship between substance use and sexual risk among young MSM [58]. Individuals who use substances before or during sex may also be attempting to cover feelings of guilt or shame or facilitate sexual activity they may otherwise be uncomfortable with [59, 60], making it an important variable to consider when examining stigma among YBMSM living with HIV.

Finally, this research examined the relationship between HIV stigma and psychological distress, as there is evidence that individuals with internalized HIV stigma are more likely to be depressed [61–64], although previous work has almost exclusively focused on adults living with HIV. Our findings suggest this association is present for YBMSM, as negative self-image was associated with nearly three times the odds of reporting psychological distress. Internalized HIV stigma, represented here by negative self-image, can make HIV disclosure difficult and may negatively influence decisions to seek medical care or social support [17, 65]. Furthermore, depression and psychological distress may make it difficult for young people to manage their health or may be associated with self-medication with drugs or alcohol for depression as a way to cope with their diagnosis [14, 23]. Consistent with previous research [66], concerns about public attitudes toward HIV were associated with nearly five times the odds of psychological distress. HIV confers a strong social stigma, which youth may internalize, leading to increased depression, anxiety, and psychological distress [30]. Intervention research with HIV-infected youth has demonstrated difficulty affecting stigma related to concern with public attitudes [30], highlighting the pervasiveness

of negative public attitudes toward HIV and the importance of community-level interventions to reduce the social stigma of HIV.

The differing associations evident among the stigma domains and outcome variables highlight the complexity of stigma and the importance of understanding the ways in which differential domains of stigma shape the lived experience of YBMSM. Furthermore, this multi-faceted exploration of HIV stigma is important given that HIV stigma research tends to conflate all aspects of HIV stigma [65, 67]. Several important relationships would have been missed had we not examined the individual stigma subscales. For example, although total stigma did not predict CAI, personalized stigma was a significant predictor, highlighting the nuances of stigma. This research also has implications for HIV prevention and treatment interventions for YBMSM. Primarily, our results highlight the need to acknowledge and address the various facets of stigma among YBMSM in future interventions. In addition to efforts to reduce societal-wide HIV stigma, we need to equip YBMSM with the tools they need to positively cope with negative stigmatizing influences, especially when newly diagnosed or beginning antiretroviral medication. The role of social support in the lives of young people with HIV may be particularly helpful; research has found that social support from friends to be inversely related to HIV stigma among Black Americans [40, 68, 69]. Additionally, efforts to address depressive symptoms, psychological distress, and substance use among this population should consider the influence of stigma on these experiences. Although our findings support established hypotheses about the relationship between stigma and psychological distress, they also raise new questions about the association between stigma and medication adherence and viral suppression, highlighting that such relationships are complex and need additional research to better understand how these factors are related to one another over time.

These findings should be considered in light of the study's limitations. The present study is based on self-report, cross-sectional data from a clinic-based sample of YBMSM living with HIV. As such, study findings cannot be used to make causal inferences and may not generalize to other YBMSM living with HIV. It also may be that YBMSM not engaged in care may experience higher stigma and risk behaviors, and poorer health than observed in our sample. Longitudinal studies conducted with a larger sample of YBMSM are needed to confirm these associations. Additionally, this study was limited to examining HIV stigma and does not account for homonegativity, racism, or transphobia, which may also play a significant role in understanding these relationships. The racial disparities in HIV occur alongside multiple, interacting stigmas that make YBMSM particularly vulnerable to HIV and disparate HIV outcomes [70]. Research has found, for example, that among Blacks living with HIV, the effects of racism were more robust than were the effects of HIV stigma on non-adherence to HIV antiretrovirals [32, 71]. It is likely that considering one type of stigma in isolation overlooks other key stigmas as determinants of health behaviors and outcomes. The inability to account for racism, homonegativity, and transphobia in this study may partially explain why some our findings differed from those of previous studies, as they may be particularly important variables. Future research should account for the intersection of multiple types of stigma to understand how living with multiple stigmatized identities may affect YBMSM. Finally, our exploration of the multiple domains of stigma revealed an extremely low alpha for the HIV disclosure subscale. As other researchers have suggested,

this two-item scale may be insufficient to capture concerns about disclosure among youth [50]. The reasons for this are unclear, but require additional exploration to determine whether and how concerns about disclosure might influence health and psychosocial outcomes for YBMSM.

Despite these limitations, this research offers important insights into HIV stigma among HIV-positive YBMSM. Such findings are made even more significant given the limited extant literature on stigma among this population. This examination of the various domains of HIV stigma allowed for an in-depth understanding of how stigma is experienced and operationalized, which is essential in the development of interventions to improve outcomes for YBMSM along the care continuum. As these results suggest, various domains of HIV stigma are significantly correlated with important sexual, psychological and clinical health outcomes among YBMSM. Stigma-informed approaches to care are needed and may be especially salient immediately following diagnosis and initiation of antiretroviral medication. Providers should bear in mind the effects of HIV stigma on YBMSM, and incorporate psychosocial screening and counseling not just at diagnosis, but throughout care. For many young adults, medical treatment may be enhanced if provided alongside easily accessible, affordable, and culturally relevant mental health treatment. Although we did not examine the relationship between mental health and engagement in care, psychological distress has been found to influence engagement and adherence to treatment [14, 23]. Additionally, identification of individual support persons and referrals to supportive community networks and organizations, beyond the standard community resource guide, may help mitigate the effects of stigma. In sum, it is clear that efforts to address and reduce HIV stigma should be an essential component of HIV care for YBMSM. Most notably, given that failure to achieve viral load suppression poses increased risk of HIV transmission [72], the association between stigma, medication adherence, and viral suppression deserves additional attention. Interventions that address the syndemic nature of health concerns among individuals living with HIV and acknowledge the impact of multiple, intersecting stigmas, are warranted and may help unpack the complex experiences facing YBMSM.

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Table 1

Project nGage sample characteristics (N = 92), Chicago 2013–2014

Variables	N (%)	Mean
Age		23.9 (2.90)
Less than HS	9 (9.8)	
HS diploma or GED	30 (32.6)	
Greater than HS	53 (57.6)	
Employment		
Full-time	30 (32.6)	
Part-time	22 (23.9)	
Unemployed	40 (43.5)	
Less than HS	9 (9.8)	
Psychological distress	12 (13.0)	
Lifetime hard drug use	35 (38.0)	
Marijuana use as a sex drug	24 (26.1)	
Partner marijuana use as a sex drug	22 (23.9)	
Condomless anal intercourse	19 (20.7)	
Group sex	10 (10.9)	
Currently taking HIV antiretrovirals	63 (68.5)	
HIV viral suppression	50 (54.3)	

Table 2

HIV stigma scale and subscales (N = 92) from Project nGage, Chicago 2013–2014

	Cronbach's alpha		Mean (SD)
Stigma scale	0.729		23.36 (5.19)
HIV disclosure	0.287	I am very careful who I tell that I have HIV	3.63 (0.72)
		I worry that people who know I have HIV will tell others	2.70 (1.24)
Personalized stigma	0.731	I have been hurt by how people reacted to learning I have HIV	2.17 (1.06)
		I have stopped socializing with some people because of their reactions of my having HIV	1.80 (0.95)
		I have lost friends by telling them I have HIV	1.70 (0.85)
Public attitudes	0.711	Most people with HIV are rejected when others find out	2.84 (0.99)
		Most people think that a person with HIV is disgusting	2.86 (0.97)
Negative self image	0.731	Having HIV makes me feel unclean	2.10 (1.01)
		I feel that I am not as good a person as others because I have HIV	1.90 (0.96)
		Having HIV makes me feel that I'm a bad person	1.70 (0.75)

Logistic regressions analyzing the relationship between AIDS-related stigma and health and psychosocial outcomes, Project nGage, 2013–2014

Table 3

	Condomless anal intercourse			Marijuana use as a sex drug			Partner marijuana use as a sex drug		
	OR	95 % CI	p value	OR	95 % CI	p value	OR	95 % CI	p value
Total HIV stigma scale	1.04	(0.98–1.09)	0.20	1.03	(0.98–1.08)	0.20	1.06	(1.00–1.11)	0.03
Personalized stigma	2.19	(1.05–4.57)	0.04	1.04	(0.55–1.98)	0.90	2.24	(1.11–4.53)	0.25
Negative self-image	1.13	(0.57–2.24)	0.73	2.28	(1.17–4.44)	0.15	1.97	(0.99–3.90)	0.51
Public attitudes	0.98	(0.52–1.82)	0.94	0.84	(0.48–1.47)	0.55	1.12	(0.62–2.02)	0.70
HIV disclosure	1.45	(0.72–2.94)	0.30	1.48	(0.78–2.82)	0.23	1.29	(0.68–2.47)	0.44
	Psychological distress			Viral suppression ^a			Medication adherence		
	OR	95 % CI	p value	OR	95 % CI	p value	OR	95 % CI	p value
Total HIV stigma scale	1.10	(1.02–1.18)	0.11	0.96	(0.91–1.00)	0.07	1.01	(0.97–1.06)	0.62
Personalized stigma	1.62	(0.74–3.57)	0.23	0.50	(0.25–1.02)	0.05	0.64	(0.34–1.19)	0.16
Negative self-image	2.95	(1.20–7.26)	0.02	0.73	(0.36–1.48)	0.39	1.20	(0.62–2.30)	0.59
Public attitudes	5.02	(1.54–16.34)	0.007	0.90	(0.50–1.63)	0.73	2.18	(1.20–3.94)	0.01
HIV disclosure	1.42	(0.61–3.30)	0.42	0.64	(0.34–1.19)	0.16	1.03	(0.58–1.85)	0.92

All regressions controlled for the effects of age, education level, and intervention effects

^aViral suppression regressions also controlled for the effects of medication adherence