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Association between Internalized HIV-related Stigma and HIV Care Visit Adherence

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Abstract

Background—Internalized HIV-related stigma acts as a barrier to antiretroviral therapy (ART) adherence, but its effects on other HIV care continuum outcomes is unclear.

Methods—Among 196 HIV clinic patients in Birmingham, Alabama, we assessed internalized HIV-related stigma and depressive symptom severity using validated multi-item scales, and assessed ART adherence using a validated single-item measure. HIV visit adherence (attended out of total scheduled visits) was calculated using data from clinic records. Using covariate-adjusted regression analysis, we investigated the association between internalized stigma and visit adherence. Using path analytic methods with bootstrapping, we tested the mediating role of depressive symptoms in the association between internalized stigma and visit adherence, and the mediating role of visit adherence in the association between internalized stigma and ART adherence.

Results—Higher internalized stigma was associated with lower visit adherence (B=−0.04, p=0.04). Black (versus white) race and depressive symptoms were significant predictors within this model. Mediation analysis yielded no effect by depression in the association between internalized stigma and visit adherence ($B = -0.18$, $SE = .11$, 95% CI [−0.44, −0.02]) in the whole sample. Supplemental mediated moderation analyses revealed gender-specific effects. Additionally, the indirect effect of internalized stigma on sub-optimal ART adherence was mediated by lower visit adherence ($B = -0.18$, $SE = .11$, 95% CI [−0.44, −0.02]).

Conclusion—Results highlight the importance of internalized HIV stigma to multiple and sequential HIV care continuum outcomes. Also, findings suggest multiple intervention targets,

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Conflicts of Interest

The authors have no conflicts of interest to declare.

including addressing internalized stigma directly, reducing depressive symptoms, and promoting consistent engagement in care.

Keywords

stigma; depression; adherence

Introduction

Since the availability of new HIV treatments in the late 1990s, HIV-related morbidity and mortality have substantially diminished in the United States (U.S.) and globally.[1] However, inadequate adherence to HIV treatment recommendations (characterized by suboptimal adherence to scheduled HIV care visits and to a recommended antiretroviral therapy [ART] regimen) among people living with HIV (PLWH) remains a substantial public health challenge that must be addressed in order to continue to curb the HIV epidemic,[2] particularly among vulnerable populations such as people of color. Visit adherence is a measure of engagement in HIV care that is defined as the number of kept/attended HIV care visits out of scheduled visits during a measurement period.[3] Engagement in HIV medical care is important to providing and maintaining ART regimens. Suboptimal visit adherence is associated with poor adherence to ART, which has implications for viral non-suppression and significant clinical drug resistance.[4]

Much of the existing literature on HIV stigma and health outcomes focuses on the association between HIV stigma and ART adherence. Several forms of HIV-related stigma (i.e., perceived, anticipated, internalized, and enacted) have been conceptualized, and operate as barriers to beneficial HIV-related behaviors and desired clinical outcomes.[5,6] Internalized HIV-related stigma refers to acceptance and adoption of negative beliefs existing in society about being HIV-positive and applying them to oneself.[5,7] Some recent literature suggests that internalized HIV-related stigma is particularly harmful to HIV treatment adherence.[8–10] However, a recent systematic review found mixed results for the relationship between internalized stigma and ART adherence.[11] Despite the growth of academic inquiry into HIV stigma and health, relatively little is known about the mechanisms that explain these relationships. It is also prudent to investigate the impact of HIV stigma on HIV medical care visit adherence in addition to ART adherence.

In the pathway to clinical outcomes, intrapersonal manifestations of stigma (such as internalized HIV-related stigma) are more proximal to HIV care outcomes than other interpersonal dimensions of stigma (such as perceived levels of HIV-related stigma in the community), perhaps because internalized HIV-related stigma has greater implications for affective, cognitive, and mental health outcomes of PLWH.[5,6,9] Prior studies report that higher internalized HIV-related stigma is associated with lower ART adherence, and this relationship can be partially explained by affective processes.[8,10] Indeed, there is a precedent in the literature that depression is a mechanism by which HIV stigma negatively impacts medication adherence.[12]

There is limited evidence to support negative effects of internalized HIV stigma on HIV care visit adherence. To date, a single study explored this association, and found that internalized

HIV stigma did not predict suboptimal HIV care visit adherence among men who have sex with men in Boston, MA.[13] Three additional studies have explored the association between internalized HIV stigma and other indicators of care connection and engagement (i.e., delay in care seeking and presence of a regular source of HIV care) in diverse settings (i.e., California and New York, U.S.; Bengaluru and Mumbai, India), with mixed results.[5,14,15] Two of these existing studies suggest that high internalized stigma is related to poor engagement in HIV care;[5,15] while the other study found evidence of an association between internalized HIV stigma and delays in medical care in bivariate analyses, but not in multivariable analyses.[11]

Despite the importance of understanding specific mechanisms by which HIV-related stigma affects HIV visit adherence and other health outcomes,[16] only one of the aforementioned studies examined potential intrapersonal mechanisms driving these associations.[15] Existing literature suggests that mediators in the relationship between internalized HIV-related stigma and ART adherence are also associated with HIV care visit adherence. For instance, a recent study reported that the association between internalized HIV-related stigma and ART adherence is mediated in part by depressive symptoms among U.S. women living with HIV.[10] In the Boston-based study among MSM living with HIV, though stigma was not directly associated with medical visit adherence, clinical depression predicted suboptimal visit adherence.[13]

Given these findings, it is possible that intrapersonal mechanisms such as depression mediate the relationship between internalized HIV stigma and engagement in medical care. From a cognitive-behavioral perspective, negative thought patterns (such as negative self-statements inherent in internalized stigma) can lead to problematic affective states such as depressive symptoms.[17,18] Furthermore, the feedback loop between negative cognitive patterns and a depressed affective state may ultimately impact behavior and the way individuals interact with their social environment.[19] Considering the consistent links between internalized HIV stigma and depression in the literature,[5,9,10,20,21] it is possible that depression partially accounts for the association between internalized stigma and visit adherence. However, this combination of predictors of visit adherence has not yet been tested in the literature.

The current study aims to fill these gaps in the literature by examining the relationship between internalized HIV-stigma and HIV care visit adherence, and the mediating role of depressive symptoms. Taking into account findings from the literature that visit adherence and adherence to ART are sequential steps in the HIV treatment cascade (which illustrates engagement in HIV care as a sequence of necessary steps from HIV infection to viral suppression)[3], we also examine whether lower visit adherence mediates the effect of internalized HIV-related stigma on suboptimal adherence to ART. This analysis may yield knowledge that can be further examined using longitudinal data in the future. Subsequently, this analysis may lead to the identification of specific areas for intervention which could be incorporated in medical, psychological, and public health practice in order to improve engagement across the HIV care continuum.

Methods

Participants and Procedures

Participants were 196 patients from the HIV clinic at the first author's institution, who participated in a larger study on psycho-social factors related to HIV outcomes from March 2013 to January 2015.[8] Analyses included participants who were on ART, who reported substance non-use, and for whom clinical data on visit adherence were available. During pre-arranged research study appointments, participants completed study measures and demographic information via computer. Data on duration of ART utilization, HIV clinic visit appointments and actual attendance were extracted from clinic records. The study was approved by the Institutional Review Board of the first author's institution, and all procedures were carried out with the adequate understanding and written consent of the participants.

Internalized HIV-related Stigma

We used the negative self-image subscale of the revised HIV Stigma Scale[22] to assess internalized HIV-related stigma. This seven-item measure is comprised of statements such as, "I feel I'm not as good as others because I have HIV/AIDS." Agreement with each item was measured on a 4-point scale, from strongly disagree to strongly agree. A composite score for the subscale was calculated by averaging participant responses across items, yielding a range in scores from 1 to 4. The internal consistency of this subscale was adequate in the present study, Cronbach's alpha (α) = .85. Internalized HIV-related stigma was analyzed continuously.

Depressive Symptom Severity

The Patient Health Questionnaire (PHQ)-9 consists of 9 items with the stem: "Over the *last 2 weeks*, how often have you been bothered by any of the following problems?" An example item is: "Feeling down, depressed, or hopeless." Participants used a rating scale ranging from 0 (not at all) to 3 (nearly every day) to rate to how frequently they were affected by depressive symptoms. Participants also indicated their level of difficulty with engaging in daily activity, as well as with other people, due to depressive symptoms.[23] Scores were summed across items yielding a possible range from 0 to 27, with higher scores indicating greater depressive symptom severity. In the current study, reliability across items was adequate with a Cronbach's α of .87. Depressive symptom severity was treated as a continuous variable in analyses.

ART Adherence

ART adherence was assessed with the single question, developed by Lu et al.[24]: "In the past 4 weeks, how was your ability to take all of your anti-HIV medications that were prescribed by your doctor?"[1] Response options ranged from very poor to excellent. Because 71.5% of participants indicated excellent adherence, responses were dichotomized (excellent versus all other response options). According to previous literature, this measure is as good as or

[1]Medication adherence data were available for 179 participants.

better than other self-report adherence measures.[25] While self-report measures may over-estimate adherence, research has consistently demonstrated the predictive value of self-reported non-adherence (i.e., non-optimal adherence).[26]

HIV Visit Adherence

In order to calculate HIV visit adherence, data on HIV clinic appointments for the prior 24-month period were extracted from clinic records. We calculated adherence to HIV visits as the proportion of attended visits out of the number of total scheduled visits (total scheduled visits = attended visits plus no shows) that were not cancelled in advance by the clinic or the patient.[27] This measure has been used successfully in prior studies on HIV care engagement.[28,29]

Data Analyses

Descriptive analyses were performed to assess the distribution of participants according to age, race (black vs. white), gender, socioeconomic status level (indicated from lower [scored as 1] to upper [5]), and duration on ART. Multiple regression analysis was used to assess the association between internalized stigma and visit adherence. We tested the mediating role of depressive symptoms in the association between internalized stigma and ART adherence, as well as the mediating role of visit adherence in the association between internalized stigma and ART adherence by calculating bias-corrected confidence intervals for the indirect effect using bootstrapping with Hayes' regression-based Process tool in SPSS.[30] The following demographic and clinical variables were included as covariates in all analyses: age, gender, race, socioeconomic status, and duration on ART. Depressive symptoms was also included as a covariate for all models in which it was not included as a mediator. In all statistical models, we applied a cutoff p-value of 0.05 and confidence interval of 95%.

Results

Demographic and clinical characteristics of the study sample (n = 196) are presented in Table 1. In a multiple regression analysis controlling for the covariates, higher internalized stigma was negatively associated with lower visit adherence ($B = -0.04$, $SE = .02$, $t = -2.06$, $p = .04$). Race and depressive symptoms were significant predictors of visit adherence in this model. Specifically, black PLWH had lower visit adherence than white PLWH ($B = -0.08$, $SE = .03$, $t = -0.22$, $p < .01$), when accounting for internalized stigma and depressive symptoms. Depressive symptoms were negatively associated with visit adherence ($B = -0.01$, $SE = .00$, $t = -2.09$, $p = .04$).

Mediation analysis did not yield a significant indirect effect of internalized stigma on visit adherence through depressive symptoms ($B = -0.18$, $SE = .11$, 95% CI [−0.44, −0.02]). Given that prior literature did not examine sex differences in the association between stigma and adherence, we examined the potential moderating role of sex in this mediated association. The index of mediated moderation was significant ($B = -0.03$, $SE = 0.02$, 95% CI [−0.07, −0.002]), suggesting that the mediation effect is stronger for men compared to women (63% vs. and 37%, respectively, in present sample). Follow-up analyses suggested that the mediation effect was significant for men ($B = -0.03$, $SE = 0.02$, 95% CI [−0.07,

−0.004]), but not for women (*B* = 0.00, *SE* = 0.01, 95% *CI* [−0.01, 0.01]). The non-significant mediation among women may partly be due to lower sample size for women. However, the fact that the index of moderated mediation was significant, suggests that the mediation effect is stronger for men compared to women.

The indirect effect of internalized stigma on ART adherence through visit adherence (*B* = −.16, *SE* = .10, 95% *CI* [−.43, −.01]) was also significant (controlling for depressive symptoms as well as the other covariates). All paths in this model are presented in Figure 1.

Discussion

While major advances in prevention and treatment of HIV have been made in recent decades, the epidemic persists in part due to challenges faced by PLWH in sustaining adherence to HIV treatments and treatment services. Experts in the HIV field have called for renewed efforts to address suboptimal engagement in HIV care by minimizing barriers to adherence to regular utilization of HIV medical care and to ART.[31] HIV-related stigma is cited as a significant barrier to HIV treatment adherence.[32] The current study examined the relationship between internalized HIV-related stigma and HIV visit adherence, mediated by depressive symptoms and separately, with downstream effects on ART adherence. Increased understanding of these relationships and mechanisms may inform the development and evaluation of strategies to reach optimal health outcomes for PLWH.

Our findings suggest that internalized HIV-related stigma is significantly associated with lower HIV care visit adherence, contrary to the non-significant results of a prior study exploring this relationship.[13] Traeger et al. measured internalized HIV stigma using a single item (“I feel ashamed that I have HIV”), which may have limited reliability and predictive validity to detect associated risks, as compared to the multi-item scale included in the current study. On the other hand, our results are consistent with prior studies using different measures of engagement in HIV care and conducted in other settings.[5,15] Visit adherence is a particularly useful measure of care engagement for use in research studies, given that it assesses engagement in care with more granularity than other existing measures.[33] Another important difference between these two studies is Traeger, et al.’s sample included MSM with HIV residing in a metropolitan area in the northeast, while our study population included men and women living with HIV in the Deep South. There may be geographic and cultural differences accounting for differences in findings between these two studies.

Another important finding was the association between race and visit adherence. Significant covariate-adjusted relationships between race and medication adherence suggesting black patients experience suboptimal ART adherence have also been observed in existing studies.[34,35] The present study contributes that this relationship may be explained by disparities in visit adherence, supporting a previous study that suggested that racial differences in engagement in care contribute to downstream clinical consequences, and this effect is mediated by visit adherence.[36] Future studies should explore the possibility that non-HIV related and intersectional stigmas (i.e., racism) contribute to these findings.[37,38]

The current study also suggests that depressive symptoms may mediate the association between internalized stigma and visit adherence among men only. In other words, men who experience greater internalized negative feelings about having HIV are more likely to also have greater depressive symptoms, which in turn may lead to lower visit adherence. The current contribution is consistent with the literature insofar as to suggest that internalized stigma operates through depressive symptoms to affect other HIV care continuum outcomes, particularly ART adherence. Our study diverges from existing literature in the suggestion that pathways from stigma to depression to engagement in HIV care could be more salient among men. This finding underscores the potential to address the effects of internalized stigma by addressing different processes in the pathway from stigma to outcomes, and perhaps using gender-specific approaches. More specifically, our study supports the suggestion that multi-faceted approaches are required to improve treatment adherence and HIV-related health;[10] in particular combined stigma-reduction and engagement in HIV care interventions may provide novel strategies.[39]

The other primary result from this study was that HIV care visit adherence mediates the effect of internalized stigma on ART adherence. Specifically, we add to the scientific literature that internalized stigma leads to lower visit adherence, which leads to lower ART adherence. This finding can be understood in the context of prior studies that emphasize the importance of regular engagement in HIV care services along multiple stages of the spectrum of engagement in HIV care (from HIV-diagnosed to ART-adherent/undetectable) for the health and well-being of PLWH. Retention in HIV care, encompassed in part by visit adherence, is an intermediary but integral component of that spectrum.[40] Individuals experiencing high internalized HIV-related stigma who do not present for HIV care visits may not benefit from aspects of the HIV care experience that act as facilitators to ART adherence, such as the patient-physician relationship,[41,42] case management,[43] patient education,[44] and contact with others who share an HIV-positive status.[45]

Given the time points at which data were collected or extracted, it is possible that the time frames in which measures of internalized stigma, depression, and adherence were assessed may have overlapped or occurred in an alternate order than our hypothesized pathway, thus limiting their comparability. The observed mediated relationships could also potentially operate in a different sequence from what we proposed; however, the direction of the variables proposed in the current analyses is one possible sequence that is supported by theory and extant literature. Additionally, we may have underestimated the effect of internalized HIV stigma on treatment adherence by exclusion of participants who reported current substance use. Preliminary data suggest that the relationship between stigma and ART adherence is moderated by substance use severity.[46] Future studies should build upon the current exploratory data analysis, and assess this clinical pathway in prospective and longitudinal investigations among more representative study samples.

Another limitation of the current study may be that we did not measure relevant variables such as patient preferences, needs, and values for visit adherence and ART adherence, which may differ from clinical targets.[47,48] Other potential barriers to HIV care visit attendance were not measured such as reliable transportation and distance from home to clinic. Future investigations should collect these data to test this model while controlling for other barriers

to attending care. Lastly, it is possible that the findings of this study may not generalize to areas outside of the southern U.S. Nevertheless, it is important to study the effects of HIV-related stigma in the southern U.S., since this region is now viewed as the epicenter of the domestic HIV epidemic, showing the highest HIV incidence and fatality rates in the U.S.[49] Internalization of stigma may be particularly pervasive in the southern U.S., where the culture of social conservatism may differentiate experiences of HIV-related stigma, as compared to other regions.[50]

This study also has several strengths with respect to the data sources: Validated instruments were used to collect self-reported data, and the other indicators included in analyses were extracted from objective clinic record data, and thus subject to less self-report bias. The current study serves as an introductory analysis to identify relationships that can be explored further using long-term longitudinal analyses. Future studies may also consider the use of patient-centered measures of engagement in care.[51] The current study also supports a growing body of literature on the specific effects of internalized stigma from studies conducted in samples from other U.S. regions.

Overall, these results provide evidence that internalized HIV stigma is associated with lower HIV care visit adherence, through the mechanism of depressive symptoms, and separately, with downstream clinical consequences on ART adherence among people living with HIV in the southern U.S. The present study points to the importance of addressing internalized HIV stigma to health care outcomes among people living with HIV, and the potential to address the negative effects of internalized stigma on ART adherence by reducing depressive symptoms and promoting consistent engagement in HIV care visits.

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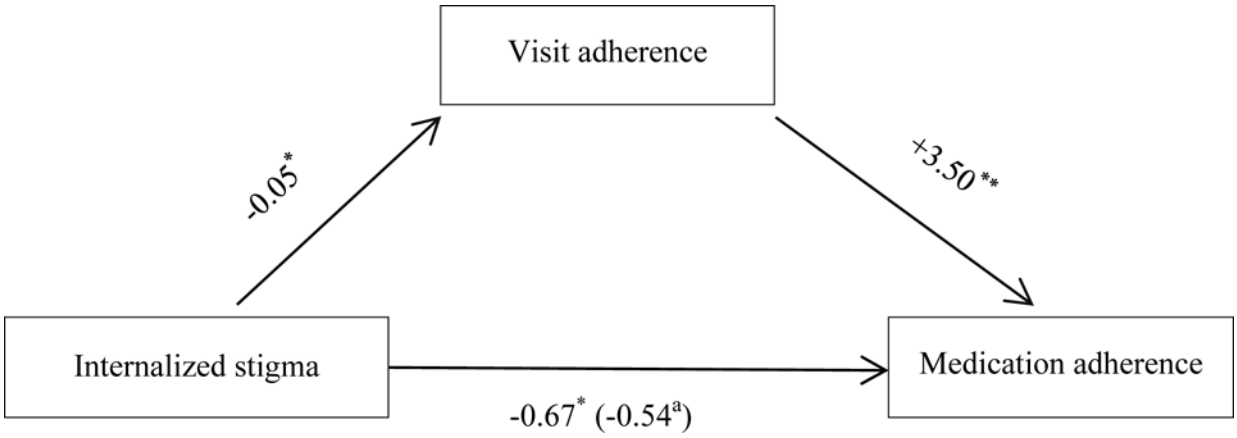

Figure 1. Visit Adherence Mediates the Effect of Internalized Stigma on Medication Adherence

Note. Associations are presented as path coefficients (unstandardized).

[a] When visit adherence is in the model.

* $p < .05$; ** $p < .01$

Table 1

Demographic and Health Information for the Study Sample (N=193).

Variable	n (%)	
Race		
White	72 (36.7)	
Black	124 (63.3)	
Gender		
Male	124 (63.3)	
Female	72 (36.7)	
Medication adherence		
Excellent	128 (71.5)	
Less than excellent	51 (28.5)	
	Mean (SD)	Range
Age (years)	44.9 (11.0)	24 – 71
Socioeconomic status[±]	2.7 (1.0)	1 – 5
Number of months on ART	96.4 (63.1)	12 – 242
Internalized HIV-related Stigma[+]	2.0 (0.7)	1 – 4
Depressive symptom severity[§]	3.7 (4.7)	0 – 27
HIV visit adherence[§§]	0.9 (0.2)	0 – 1

[±]Defined as socioeconomic status level, indicated from lower (1) to upper (5);

[+]Internalized stigma scores ranged from strongly disagree (1) to strongly agree (5);

[§]Greater depressive symptom severity was indicated by higher score;

[§§]Defined as the proportion of attended out of total scheduled visits;