Published in final edited form as:

AIDS Behav. 2015 January ; 19(1): 41–49. doi:10.1007/s10461-014-0758-3.

HIV Stigma and Physical Health Symptoms: Do Social Support, Adaptive Coping, and/or Identity Centrality Act as Resilience Resources?

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Abstract

Despite efforts to eliminate it at the societal level, HIV stigma persists and continues to threaten the health of people living with HIV (PLWH). We tested whether social support, adaptive coping, and/or HIV identity centrality act as resilience resources by buffering people from the negative impact of enacted and/or anticipated stigma on stress and ultimately HIV symptoms. Ninety-three PLWH completed a survey, and data analyses tested for evidence of mediation and moderation. Results demonstrated that instrumental social support, perceived community support, and HIV identity centrality buffered participants from the association between anticipated stigma and HIV symptoms. That is, anticipated stigma was associated with HIV symptoms via stress only at low levels of these resources. No resources buffered participants from the impact of enacted stigma. Identifying and enhancing resilience resources among PLWH is critical for protecting PLWH from the harmful effects of stigma.

Keywords

HIV; Identity centrality; Resilience; Social support; Stigma; Palabras claves; VIH; Identidad central; Resaltar; Soporte social; Estigma

Introduction

HIV stigma, or social devaluation and discrediting of people living with HIV (PLWH) [1–4], has long been recognized as a significant threat to combatting the HIV epidemic. Ending HIV stigma is a priority of the National HIV/AIDS Strategy for the United States [5]. Like stigma associated with many socially devalued characteristics (e.g., race, sex), however, HIV stigma has proven difficult to eliminate both in the United States and throughout the world. Given that HIV stigma has proven difficult to eliminate yet continues to undermine the health of PLWH, it is important to uncover strategies to protect PLWH from the harmful effects of stigma.

Stigma is experienced by individual PLWH as a series of stigma manifestations, including enacted and anticipated stigma [6]. Enacted stigma, or perceived experiences of discrimination from others in the past or present, is associated with poor physical health outcomes [7], including more severe HIV symptoms [8, 9] and lower CD4 counts [10] among PLWH. Likewise, anticipated stigma, or expectations of discrimination from others in the future, is associated with greater physical illness symptoms among people living with concealable socially devalued characteristics (e.g., physical or mental illness) [11]. Recent theoretical work calls for a greater focus on resilience resources, or resources that buffer PLWH from associations between stigma with poor health, to inform interventions to protect PLWH from the negative impact of stigma [6]. The current study investigates whether social support, adaptive coping, and/or HIV identity centrality act as resilience resources by buffering PLWH from associations between enacted and/or anticipated stigma with HIV symptoms.

Enacted and Anticipated Stigma, Stress, and HIV Symptoms

As noted above, prior research demonstrates that stigma experienced by PLWH is associated with more severe HIV symptoms such as fatigue, gastro-intestinal upset, numbness, body changes (e.g., weight gain), and bruising/bleeding [8, 9]. Both enacted and anticipated stigma may be associated with more severe HIV symptoms among PLWH via the mechanism of stress [7, 12]. Meta-analytic evidence demonstrates that enacted stigma is associated with both physical stress responses and perceived psychological stress [7, 13]. Although less studied, Link and Phelan theorize that the “constant threat of being stigmatized” (p. 528) inherent in anticipated stigma is also associated with stress. Indeed, people living with chronic illnesses who anticipate stigma from their friends and family as well as work colleagues report more perceived psychological stress [14].

Stress, in turn, is associated with poor health outcomes including more severe HIV symptoms among PLWH. Stress experienced by PLWH in the forms of traumatic events, bereavement, and everyday hassles is associated with HIV disease progression, including

development of HIV-related clinical symptoms, decreased CD4 counts, development of AIDS, and increased risk of mortality (for reviews, see [15], [16]). Evidence suggests that stress impacts HIV disease progression via dysregulation of the hypothalamic–pituitary–adrenal axis and sympathetic nervous system.

Resilience Resources: Social Support, Adaptive Coping, Identity Centrality

A recent review sets a resilience agenda for HIV stigma research by calling for a greater focus on understanding and promoting resilience resources: modifiable, strength-based moderators of the association between stigma and health [6]. It highlights social support and adaptive coping as potential resilience resources that may be possessed by PLWH. Additionally, meta-analytic work grounded in research on people living with a variety of socially devalued characteristics suggests that social support, adaptive coping, and identity centrality may moderate associations between stigma and health outcomes [7]. This work further suggests that moderators act on associations between experiences of stigma and stress specifically. That is, resilience resources may buffer people from experiencing stress in response to enacted and anticipated stigma. By buffering people from stress, resilience resources may ultimately weaken associations between enacted and anticipated stigma with health outcomes. This hypothesized process is depicted in Fig. 1.

Social Support—Social support includes comfort, assistance, and/or information that individuals receive from individuals or groups [17]. Social support received from individuals can come in a variety of forms, including emotional/informational (i.e., expression of positive feelings and empathetic understanding) and instrumental/tangible (i.e., provision of material support or behavioral assistance) [18]. Beyond support from individuals, there is a wide range of social support services that may be available from groups and organizations from which PLWH may draw both emotional and instrumental support. These may include healthcare, legal, substance abuse (e.g., Narcotics Anonymous and Alcoholics Anonymous), and other services.

Social support may enhance PLWH's resilience to enacted and anticipated stigma by helping them regulate their emotions and problem solve [6]. For example, PLWH may draw on social support to calm feelings of distress resulting from or develop strategies to respond to enacted stigma. Past research on the extent to which social support acts as a resilience resource is mixed, however. In a meta-analysis of studies including people living with a variety of socially devalued characteristics, only a minority of studies demonstrated that social support from individuals moderated the impact of enacted stigma on stress and physical health outcomes [7]. Most studies found no evidence of moderation, and a few studies found that some forms of social support (e.g., ethnic support) actually intensified the relationship between enacted stigma and poor health outcomes. Among PLWH specifically, one study found that social support received from individuals did not moderate associations between enacted stigma and depression [19].

Despite these generally null findings, social support may moderate associations between experiences of stigma and health outcomes among PLWH in ways that have yet to be tested. For example, although past research generally suggests that social support does not buffer

people from associations between enacted stigma and health, social support may buffer people from associations between anticipated stigma and health. PLWH who perceive that they have support from individuals and organizations may believe that they can better handle future experiences of discrimination, and therefore feel less stress in response to anticipated stigma. Additionally, past research focuses on social support from individuals rather than groups and organizations. PLWH may perceive groups and organizations to be more powerful resources for dealing with enacted and anticipated stigma, and therefore support from organizations may serve as a better buffer of associations between enacted and anticipated stigma with stress.

Adaptive Coping—Coping processes involve psychological and behavioral actions that people employ to manage stressors, or demands in their environment such as those brought on by enacted and anticipated stigma [20]. Adaptive coping (as well as related constructs such as active and resilient coping) has attracted increasing attention as a specific coping process that enables individuals to recover from and positively adapt to major stressors [21]. Adaptive coping involves active attempts to manage stressors in positive ways, for example by searching for creative ways to alter and controlling reactions to difficult situations [21].

By engaging in adaptive coping, PLWH may experience less stress in response to enacted and anticipated stigma. Past research, however, is again mixed regarding whether adaptive coping acts as a resilience resource in response to stigma. Meta-analytic evidence suggests that active or problem-focused coping processes may buffer people with socially devalued characteristics from associations between enacted stigma with stress and physical health [7]. However, two studies have failed to find evidence that adaptive coping buffers PLWH from the impact of stigma on depression [19, 22]. It is possible that adaptive coping is more effective in helping PLWH feel that they can handle demands brought on by enacted and anticipated stigma (i.e., stress), rather than preventing depressed affect resulting from enacted and anticipated stigma.

Identity Centrality—Centrality is the extent to which individuals feel that a specific identity or aspect of the self, such as being HIV-positive, defines who they are as a person [23]. Whether an individual considers their HIV status to be a defining aspect of their identity could have important implications for their responses to enacted and anticipated stigma. Research among racial and ethnic minorities suggests that centrality of racial/ethnic identity can have a buffering effect on the association between enacted stigma and health [7]. For example, experiences of enacted stigma are less strongly associated with decreased mental health outcomes among people who report that their race/ethnicity more strongly defines who they are as a person [24]. No known research has examined whether centrality of HIV moderates the impact of enacted or anticipated stigma on health outcomes among PLWH.

Current Study

In the current study, we examine whether social support, adaptive coping, and/or HIV identity centrality moderate the impact of enacted and/or anticipated stigma on HIV symptoms. As shown in Fig. 1, we hypothesize a moderated mediation model. That is, we

hypothesize that stress mediates, or plays a role in, associations between enacted and anticipated stigma with HIV symptoms. We further hypothesize that social support, adaptive coping, and HIV identity centrality moderate associations between enacted and anticipated stigma with stress, ultimately moderating associations between enacted and anticipated stigma with HIV symptoms. Given past theoretical and empirical work, we expect that social support, adaptive coping, and HIV identity centrality will act as resilience resources by buffering PLWH from experiencing stress in response to enacted and anticipated stigma.

Methods

Procedure and Participants

Participants were recruited from drop-in centers, housing programs, and other organizations providing services to PLWH in Connecticut between November 2012 and April 2013. Staff at recruitment sites advertised the study to clients who met study eligibility requirements (i.e., HIV-positive, English-speaking, and 18 years or older) and informed them of when research assistants would be present to administer the study. Interested clients met with research assistants at recruitment sites. Research assistants verified study eligibility, and further introduced the study to clients. Clients who met eligibility requirements and verbally consented to the study responded to a pencil-and-paper survey that took an average of 48 min ($SD = 16$) to complete. Participants were compensated \$25. All procedures were approved by a Human Investigation Committee.

Ninety-three people completed the survey. Sample socio-demographic characteristics were reflective of recruitment sites (Table 1). Participants represented a wide age range. The majority identified as Black and/or Latino(a), and heterosexual. Slightly over half of participants were male. Approximately one-third of participants had not graduated high school, one-third graduated high school, and one-third had some education beyond high school. Most participants were on disability or sick leave, and reported an income of less than \$1,000 per month. Over half of the participants lived in a home that they owned or rented, with several more living in HIV/AIDS housing programs. Participants reported living with HIV for an average of 18 years, and approximately one-third reported that they had been diagnosed with AIDS.

Measures

Participants provided information regarding socio-demographic characteristics and HIV history (reported above), as well as stigma, resilience resources, and health outcomes.

Enacted and Anticipated Stigma—Participants reported the frequency with which they have experienced enacted stigma and the extent to which they anticipate stigma using the HIV Stigma Mechanism Measure, which has demonstrated strong reliability and validity (i.e., associations with chronic illness co-morbidity and CD4 count) among PLWH [10]. The enacted stigma measure includes nine items to which participants respond on a scale ranging from 1 (*never*) to 5 (*very often*). An example item is “Healthcare workers have treated me with less respect.” The anticipated stigma measure also includes nine items to which participants respond on a scale ranging from 1 (*very unlikely*) to 5 (*very likely*). An example

item is “Family members will look down on me.” Both scales demonstrated strong internal reliability in the current sample (Cronbach’s $\alpha = 0.82$ for enacted and 0.92 for anticipated). Composite scores were created by averaging items.

Instrumental and Emotional Social Support—Participants indicated the frequency with which they received instrumental and emotional social support from others using the modified Medical Outcomes Study Social Support Survey, which demonstrated excellent reliability and validity (e.g., associations with marital status) in past work [25]. The measure includes eight items, with four items designed to measure instrumental support and four items designed to measure emotional support. Participants are asked how often different types of support are available to them, and indicate responses on a scale ranging from 1 (*none of the time*) to 5 (*all of the time*). Example items include “Someone to take you to the doctor if you needed it” (instrumental support), and “Someone who understands your problems” (emotional support). Both subscales demonstrated strong internal reliability in the current sample (Cronbach’s $\alpha = 0.93$ for instrumental and 0.93 for emotional). Composite scores were created by averaging items.

Perceived Community Support—Participants reported the extent to which they perceived that support is available to PLWH in their community using a measure created for the current study. Participants were asked to indicate the extent to which they had access to ten services that are accepting/supportive of PLWH, including: housing services, healthcare services, pharmacy services, legal services, Narcotics Anonymous meetings, Alcoholics Anonymous meetings, substance use services, mental health treatment services, social support services, and church services. Participants indicated their responses on a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The scale demonstrated strong internal reliability (Cronbach’s $\alpha = 0.96$). A composite score was created by averaging items.

Adaptive Coping—Participants reported whether they used adaptive coping strategies using the Brief Resilient Coping Scale, which demonstrated acceptable reliability and strong validity (e.g., associations with a wide range of coping behaviors and resources) in past work [21]. Participants were asked about the extent to which four items describe their behavior and actions on a scale from 1 (*not at all*) to 5 (*very well*). An example item is “I look for creative ways to alter difficult situations.” The scale demonstrated strong internal reliability in the current sample (Cronbach’s $\alpha = 0.79$). A composite score was created by averaging items.

HIV Identity Centrality—Participants indicated the extent to which their HIV was a central aspect of their identity using a modified version of the identity subscale of the Collective Self-Esteem Scale [26]. Participants responded to four items: two adapted from the original identity subscale and two based on previous work with people living with concealable stigmatized identities [27]. Participants were asked to indicate the extent to which they agreed to items on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*). Items included “My HIV-status is an important reflection of who I am,” “In general, my HIV-status is an important part of the way I see myself,” “It is impossible to understand me

without knowing that I have HIV,” and “I would be a different person if I did not have HIV.” The scale demonstrated internal reliability (Cronbach’s $\alpha = 0.78$). A composite score was created by averaging items.

Stress—Participants reported the extent to which they felt stress using two items from the short version of the Perceived Stress Scale, which has demonstrated strong reliability and validity (e.g., associations with mental and physical health) in many samples [13]. Participants indicated the frequency with which they felt stress over the past month, on a scale ranging from 0 (*never*) to 4 (*very often*). Items included “In the last month, how often have you felt that you were unable to control the important things in your life?” and “In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?” A composite score was created by averaging the items (Cronbach’s $\alpha = 0.70$).

HIV Symptoms—Participants indicated the severity of their HIV physical symptoms using the Revised Sign and Symptom Check-List for HIV, which demonstrated validity (e.g., agreement with healthcare professional assessments) in past work with PLWH [28]. Participants responded to 49 items describing symptoms that they may have had in the past week, including muscle aches, fever, diarrhea, and mouth ulcers. After an initial review of the scale by community partners, four symptoms were added to the validated scale to best represent symptoms reported by the population from which the sample was drawn. These included concern over weight loss/wasting, difficulty sleeping, unable to sleep, and slept too much. Participants indicated whether they experienced the symptom on a scale including: 0 (*not at all*), 1 (*mild*), 2 (*moderate*), or 3 (*severe*). A composite score was created by summing items.

Analysis Strategy

We first conducted a series of preliminary analyses. We explored descriptive statistics, including skew and kurtosis, to evaluate the distribution of variables. We also examined correlations between enacted and anticipated stigma with outcome variables (including stress and HIV symptoms), and the associations between socio-demographic characteristics with outcome variables to identify appropriate control variables for analyses. We then evaluated our primary hypotheses by testing for evidence of moderated mediation using linear regressions and Hayes’s PROCESS tool [29], which is a regression based macro. All analyses were conducted with SPSS version 21.

Results

Our preliminary analyses indicated that the variable enacted stigma had a non-normal distribution (skew > 2 and kurtosis > 7) [30, 31]. We therefore transformed this variable by taking its logarithm [32], which resulted in a normally distributed variable. We used the logarithm transformed version of enacted stigma in subsequent analyses.

Both enacted and anticipated stigma were correlated with stress: participants who reported greater enacted and anticipated stigma reported greater stress (Table 2). Enacted stigma was associated with greater HIV symptoms: participants who reported greater enacted stigma

reported more severe HIV symptoms. Anticipated stigma was not directly correlated with HIV symptoms. Stress was further correlated with HIV symptoms: participants who reported more stress also reported more severe HIV symptoms. Gender was the only socio-demographic characteristic associated with HIV symptoms [$B(SE) = -14.75(5.69)$, $p = 0.01$]; men reported less severe HIV symptoms than women and transgendered individuals. No socio-demographic characteristics were associated with stress. Gender was controlled for in all subsequent regression analyses.

We next tested whether stress mediated the association between enacted and/or anticipated stigma and HIV symptoms (Table 3). There were statistically significant indirect effects of both enacted and anticipated stigma on HIV symptoms via stress, demonstrating evidence of mediation. In the case of enacted stigma, the mediation was partial given that enacted stigma remained associated with HIV symptoms after controlling for stress (Fig. 1, path c'). Although anticipated stigma was not directly associated with stress (path c), mediation can exist even if the direct association is statistically null [33].

Lastly, we tested for evidence of moderated mediation. We examined whether hypothesized moderators interacted with enacted and/or anticipated stigma to predict stress (path m). This interaction term was statistically significant between anticipated stigma and instrumental social support [$B(SE) = -0.28(0.13)$, $p = 0.04$] and perceived community support [$B(SE) = -0.34(0.16)$, $p = 0.04$]. The interaction term for anticipated stigma and HIV identity centrality was marginal [$B(SE) = -0.25(0.14)$, $p = 0.08$]. Bootstrap analyses demonstrated that anticipated stigma had an indirect effect on HIV symptoms via stress only at the lowest percentiles of instrumental social support, perceived community support, and HIV identity centrality (Table 4). At higher percentiles of instrumental social support, perceived community support, and HIV identity centrality, anticipated stigma was not associated with stress and had no indirect or direct effect on HIV symptoms.

No other combinations between enacted and/or anticipated stigma and hypothesized resilience resources provided evidence for moderated mediation. That is, all paths m were non-significant indicating that neither emotional social support [$B(SE) = -0.16(0.12)$, $p = 0.18$] nor adaptive coping [$B(SE) = 0.06(0.15)$, $p = 0.66$] moderated the association between anticipated stigma and stress; and that neither instrumental social support [$B(SE) = -0.27(0.52)$, $p = 0.60$], emotional social support [$B(SE) = -0.17(0.54)$, $p = 0.76$], perceived community support [$B(SE) = -1.30(0.82)$, $p = 0.12$], adaptive coping [$B(SE) = 0.51(0.60)$, $p = 0.40$], nor HIV identity centrality [$B(SE) = 0.68(0.73)$, $p = 0.36$] moderated the association between enacted stigma and stress.

Discussion

We examined whether social support, adaptive coping, and/or HIV identity centrality acted as resilience resources in associations between enacted and/or anticipated stigma and HIV symptoms among a sample of PLWH. We tested for moderated mediation and found that instrumental social support, perceived community support, and HIV identity centrality acted as resilience resources for associations between anticipated stigma and HIV symptoms. That is, at low levels of these resources, anticipated stigma was associated with HIV symptoms

via stress. At higher levels of these resources, anticipated stigma was not associated with HIV symptoms via stress. Results further suggested that neither emotional social support nor adaptive coping acted as resilience resources for associations between anticipated stigma and HIV symptoms; and neither social support, adaptive coping, nor HIV identity centrality acted as resilience resources for associations between enacted stigma and HIV symptoms.

This study expands on previous work on resilience to stigma in several ways. First, it suggests that resources may be more effective in bolstering resilience to anticipated stigma than to enacted stigma. Second, it differentiates between different types of social support and suggests that instrumental social support is a more effective resilience resource than emotional social support. It also measures social support from both individuals and organizations, and provides the first known evidence that perceived community support from organizations is a resilience resource for PLWH. Third, results are consistent with previous work suggesting that adaptive coping may be less effective at buffering associations between stigma and health outcomes than other types of resilience resources among PLWH [19, 22]. Fourth, it provides the first known evidence that HIV identity centrality may be a resilience resource among PLWH. Past work has shown this association for racial/ethnic minorities [7, 24], but research has yet to show this association for PLWH.

Limitations and Future Directions

There are a number of limitations of the current work that future work may improve upon. The sample included PLWH recruited from drop-in centers, housing programs, and other service organizations in Connecticut. Results may not be generalizable to PLWH who do not access these services or to PLWH living in other geographic areas. Further impacting the generalizability of results, participants of this study perceived low levels of enacted stigma (skewing this variable); and generally were low-income, had low educational achievement, and were on disability or sick leave from the workplace. Future research should seek to replicate findings among more diverse samples of PLWH, recruited from a variety of sources.

The cross-sectional methodology is another limitation of the current work, which prohibits conclusions about causal relationships between the constructs examined. This may particularly be an issue for understanding the roles of social support, adaptive coping, and HIV identity centrality in associations between stigma and health. Consistent with recent theory and research [6, 7], these were treated as moderators of associations between enacted and anticipated stigma with health outcomes. It could also be the case, however, that these constructs mediate associations between enacted and anticipated stigma with health outcomes. Future research should employ longitudinal methodology to examine the extent to which resources such as social support, adaptive coping, and identity centrality act as moderators and/or mediators of associations between stigma and health. The current study employed brief measures of several constructs, including stress and adaptive coping. Future research should employ longer, perhaps multidimensional measures of these constructs to further explore associations between stigma, resilience, and health.

Although this study identified several resilience resources of the association between anticipated stigma and HIV symptoms, it did not identify resilience resources of the

association between enacted stigma and HIV symptoms. Given the toll that enacted stigma takes on health (e.g., greater stress and more severe HIV symptoms in the current study), it is important for future research to continue to search for buffers of this association.

This study found that HIV identity centrality buffered people from the impact of anticipated stigma on HIV symptoms. This is consistent with some work among racial/ethnic minorities [7, 24], however past work has not examined the extent to which HIV identity centrality moderates the impact of stigma on health outcomes among PLWH. Past work has found that greater identity centrality is associated with poor health outcomes among people living with concealable socially devalued characteristics (e.g., mental and physical illnesses; [11]). Therefore, these results should be considered preliminary and future research should continue to examine the extent to which identity centrality and other measures of identity magnitude (e.g., salience) moderate associations between stigma and health. Furthermore, future research may explore the conditions under which identity centrality buffers versus intensifies associations between stigma and health. It is possible that identity centrality buffers these associations when the identity is considered positive, but intensifies these associations when the identity is considered negative.

Conclusions

The current work has implications for interventions with PLWH. It suggests that PLWH who perceive greater instrumental social support from individuals and support from organizations experience less stress in response to anticipated stigma, potentially ultimately protecting them from experiencing greater HIV symptoms. Interventions to enhance social support can be effective [34]. At the individual level, interventions might seek to bolster instrumental social support by including significant others (e.g., family, friends) and/or peers (e.g., other PLWH) in treatment and services when feasible (for a review of such interventions, see [34]). At the community level, interventions might seek to enhance services available to PLWH, ensure that these services are accepting and supportive, and advertise these services widely so that PLWH in the community are aware of them.

Community advocates, policy makers, and scientists have made significant strides toward eliminating HIV stigma since the beginning of the epidemic, effectively reducing HIV stigma in many areas of the world. However, HIV stigma persists and continues to negatively impact PLWH. Until HIV stigma has been eradicated completely, it is critical to identify and bolster resources that enhance resilience to HIV stigma so that PLWH can live full, healthy lives.

Acknowledgments

The project described (P30MH062294) as well as Dr. Earnshaw's efforts (T32MH020031) were supported by awards from the National Institute of Mental Health. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Center for Interdisciplinary Research on AIDS or the National Institutes of Health. We are grateful to the Community Research Core at the Center for Interdisciplinary Research on AIDS for their feedback on this work, our collaborators for facilitating data collection, Mildred Fernandez for translating our abstract to Spanish, and the participants of this study for sharing their experiences with us.

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Fig. 1.
Conceptual model

Table 1

Participant socio-demographic characteristics

Characteristic	% (n) or M (SD), range
Age	50.28 (8.55), 21–68
Race	
Black	55.9 (52)
White	19.4 (18)
Other	18.3 (17)
Ethnicity: Latino(a)	38.7 (36)
Gender	
Male	59.1 (55)
Female	37.6 (35)
Transgender	3.2 (3)
Sexual orientation	
Heterosexual	81.7 (76)
Gay, lesbian, and/or bisexual	15.1 (14)
Education	
Less than HS degree	35.5 (33)
HS degree	36.6 (34)
More than HS degree	28.0 (26)
Employment	
On disability/sick leave (or pending)	71.0 (66)
Employed	12.9 (12)
Unemployed	6.5 (6)
Income per month	
\$0–1,000	71.0 (66)
\$1,001 or more	23.7 (22)
Housing	
House, condo, apt that own or rent	63.4 (59)
HIV/AIDS housing program	22.6 (21)
Other: unstable	10.8 (10)
Years living with HIV	18.11 (8.14), 1–36
Diagnosed with AIDS	34.4 (32)

Percentages may not sum to 100 due to missing data

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Table 2
Means (SD) of and correlations between enacted and anticipated stigma, resilience resources, and health outcomes

Variables	M (SD)	Enacted stigma	Anticipated stigma	Instrumental social support	Emotional social support	Perceived community support	Adaptive coping	HIV identity centrality	Stress
Enacted stigma	1.51 (0.69)	–							
Anticipated stigma	1.59 (0.81)	0.63**	–						
Instrumental social support	3.38 (1.34)	−0.34**	−0.39**	–					
Emotional social support	3.61 (1.23)	−0.35**	−0.36**	0.90**	–				
Perceived community support	4.07 (0.89)	−0.09	−0.18 [†]	0.25*	0.35**	–			
Adaptive coping	3.83 (0.91)	−0.23*	−0.18 [†]	0.41**	0.51**	0.25*	–		
HIV identity centrality	3.02 (1.18)	0.26*	0.20*	0.06	0.04	0.12	0.07	–	
Stress	1.48 (1.13)	0.29**	0.22*	−0.20 [†]	−0.19 [†]	−0.08	0.04	0.34**	–
HIV symptoms	32.34 (26.23)	0.33**	0.15	−0.07	−0.17	−0.19 [†]	−0.04	0.07	0.42**

Scores on the anticipated stigma, enacted stigma, HIV identity centrality, adaptive coping, instrumental social support, emotional social support, and perceived community support measures ranged from 1 to 5; stress ranged from 0 to 4; and physical symptoms ranged from 0 to 3 for individual items, for a total possible score of 0–147

[†] *p* 0.10;
* *p* 0.05;
** *p* 0.01

Table 3
Indirect effects of enacted and anticipated stigma on HIV symptoms via stress, including B(SE)

Stigma	Path c	Path c'	Path a	Path b	Indirect effect, CI
Enacted stigma	51.35 (16.17) **	33.76 (15.63) *	2.02 (0.72) **	8.73 (2.24) **	17.59 (7.92), 5.76–38.58
Anticipated stigma	5.33 (3.32)	2.54 (3.12)	0.30 (0.15) *	9.38 (2.26) **	2.79 (1.62), 0.18–6.60

* $p < 0.05$;

** $p < 0.01$

Table 4

Indirect effects of anticipated stigma on HIV symptoms via stress at values of resilience resources

Resilience resource	Percentile	Value	B (SE)	Confidence interval
Instrumental social support				
	10th	1.25	6.07 (3.06)	1.15 – 12.87
	50th	3.25	0.72 (1.60)	-2.02 – 4.32
	90th	5.00	-3.96 (3.01)	-10.29 – 1.51
Perceived community support				
	10th	2.90	5.34 (2.23)	0.95 – 9.79
	50th	4.00	2.13 (1.46)	-0.15 – 5.49
	90th	5.00	-0.80 (2.23)	-4.36 – 4.70
HIV identity centrality				
	10th	1.00	8.33 (4.90)	0.11 – 19.33
	50th	3.25	2.89 (1.73)	0.33 – 6.90
	90th	4.25	0.47 (2.13)	-3.14 – 5.29