

*Original Article*

## A Cross-Sectional Relationship Between Social Capital, Self-Compassion, and Perceived HIV Symptoms

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### Abstract

**Context.** Individual resources of social capital and self-compassion are associated with health behaviors and perceived symptoms, suggesting that both are positive resources that can be modified to improve a person's symptom experience.

**Objectives.** The aim was to examine the relationship between self-compassion and social capital and its impact on current HIV symptom experience in adult people living with HIV (PLWH). We further explored the impact of age on this relationship.

**Methods.** We conducted a cross-sectional analysis of 2182 PLWH at 20 sites in five countries. Social capital, self-compassion, and HIV symptom experience were evaluated using valid and reliable scales. To account for inflated significance associated with a large sample size, we took a random sample of 28% of subjects ( $n = 615$ ) and conducted correlation analyses and zero-inflated Poisson regression, controlling for known medical and demographic variables impacting HIV symptom experience.

**Results.** Controlling for age, sex at birth, year of HIV diagnosis, comorbid health conditions, employment, and income, our model significantly predicted HIV symptom experience (overall model  $z = 5.77$ ,  $P < 0.001$ ). Employment status and social capital were consistent, negative, and significant predictors of HIV symptom experience. Self-compassion did not significantly predict HIV symptom experience. For those reporting symptoms, an increase in age was significantly associated with an increase in symptoms.

**Conclusion.** Employment and social capital modestly predicted current HIV symptom experience. Social capital can be incorporated into symptom management interventions, possibly as a way to reframe a person's symptom appraisal. This may

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be increasingly important as PLWH age. The relationship between employment status and HIV symptom experience was significant and should be explored further. *J Pain Symptom Manage* 2015;50:59–68. © 2015 American Academy of Hospice and Palliative Medicine. Published by Elsevier Inc. All rights reserved.

### Key Words

*Symptom, HIV, self-compassion, social capital*

## Introduction

Over the past two decades, HIV has transitioned from an acute to a chronic health condition. The symptom experiences for people living with HIV (PLWH) also have evolved from symptoms related to illness progression and toxic antiretroviral therapies (ART) to symptoms consistent with long-term adherence to better tolerated ARTs and age-related comorbidities.<sup>1</sup> Recently, investigators found that despite the remarkable advances in treatment, PLWH continue to experience prevalent and distressing symptoms, and that those symptoms have a significant impact on daily functioning across varied populations.<sup>2–6</sup> Despite improvements in ART, symptoms such as depression and fatigue are a leading contributor to poor antiretroviral treatment adherence<sup>4,7</sup> and poor quality of life,<sup>8</sup> underscoring the significance of and need for effective and scalable symptom management strategies for PLWH.

Recent HIV symptom management strategies include clinician- and peer-delivered cognitive skill-building interventions,<sup>9,10</sup> an HIV-specific symptom management manual,<sup>11</sup> a Web-based HIV symptom management information tool,<sup>12</sup> and mindfulness-based stress reduction interventions.<sup>13,14</sup> The success of mindfulness-based interventions in PLWH suggests that symptom management strategies focusing on regulating emotional responses to symptoms are a promising approach. Strategies targeting self-compassion as a way to modulate emotional regulation may improve HIV symptom management.

Self-compassion involves feelings of “caring and kindness toward oneself in the face of personal suffering and involves the recognition that one’s suffering, failures, and inadequacies are part of the human condition.”<sup>15–17</sup> PLWH often confront stigma and discrimination that may contribute to self-criticism, isolation, and avoidance of internally satisfying experiences.<sup>18</sup> This can lead to overidentification with negative thoughts and feelings and may subsequently lead to an increased negative appraisal of symptom intensity. Accordingly, investigators have found negative associations between self-compassion and depressive symptoms,<sup>19</sup> symptoms of schizophrenia,<sup>20</sup> and pain catastrophizing.<sup>21</sup> However, the relationship between self-compassion and symptom intensity has not been explored among PLWH.

Social capital is the “aggregate of potential resources, which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition”<sup>22,23</sup> and also may modulate self-regulation. Social capital represents the degree to which a person has access to high-quality social resources, including social support through social networks. Among PLWH, social capital has been shown to impact a number of health-related outcomes including decreases in HIV transmission,<sup>24–27</sup> self-reported physical and psychological health,<sup>28</sup> behaviors including HIV self-management,<sup>29</sup> and HIV medication adherence.<sup>30–32</sup> Available high-quality social resources have been shown to influence one’s regulation of emotions surrounding symptoms.<sup>33</sup> Two particular social resources, social support and social networks, have been found to be important in chronic disease symptom management.<sup>34</sup> Recently, Fierz et al.<sup>34</sup> reported on the importance of social resources and the individual interpretation in managing symptoms.<sup>34</sup> As a measure of available social resources, individual social capital may encapsulate many of the resources necessary for PLWH to adequately manage their daily symptoms. Furthermore, one’s perception of available social resources may influence his or her appraisal of symptoms, yet this relationship is unexplored.

As PLWH age, they may experience an increase in chronic comorbid health conditions and distressing symptoms; however, older PLWH are more socially connected than younger PLWH.<sup>35</sup> This increased social connectedness may allow older PLWH to better manage their daily symptoms. Furthermore, Brion et al.<sup>18</sup> demonstrated that self-compassion may increase with the time a person is living with HIV, especially as they learn how to better accept their diagnosis and manage living with HIV. The effect of age, or time since HIV diagnosis, on a person’s HIV symptom experience may be associated with the individual’s perception of social capital and self-compassion, but this relationship has not been described.

The objective of the present study was to extend the previous literature by examining the relationship between self-compassion and social capital and its impact on the current HIV symptom experience in adult PLWH. With the rapid increase in older PLWH globally, we further explored the impact of age on this relationship hypothesizing that older PLWH would have

more self-compassion and social capital, which would attenuate their symptom intensity. Given available literature, we anticipated that social capital and self-compassion would be negatively associated with symptom intensity in PLWH. The potential influence of social capital and self-compassion on symptom experience is unexplored; it may offer novel insights into how to efficiently modify one's appraisal of his or her symptoms.

## Methods

### Setting

This was a cross-sectional study conducted by the International Nursing Network for HIV/AIDS Research. Data were collected from study sites in Vancouver, Canada; Shanghai, China; Windhoek, Namibia; Bangkok, Thailand; and from 13 sites in the U.S. (Boston, MA; Chicago, IL; Cleveland, OH; Corpus Christi, TX; Durham, NC; Harlingen, TX; Honolulu, HI; Newark, NJ; New York, NY; San Francisco, CA; San Juan, PR; Seattle, WA; and Wilmington, NC). Institutional review board (IRB) approval was obtained by the coordinating site and at each respective study site. Each site director adhered to a common data collection protocol, and all participants gave informed consent before completing any study procedures.

### Participants and Data Collection Procedures

Each site sought to recruit a convenience sample of a minimum of 100 adults living with HIV infection. Participants included adults (older than 18 years), who were diagnosed with HIV infection and were able to give informed consent in their local language. Participants were recruited through flyers and health care provider referral at local HIV clinics or HIV service organizations. Potential participants contacted study staff who screened them for study eligibility and scheduled an appointment to complete study procedures. Additional participants were recruited in HIV clinics by study staff who screened and enrolled them, and completed study procedures in a private room. After giving informed consent, participants completed a self-administered survey comprising 16 instruments. Participants who were unable to read the survey were given the opportunity to complete it by interview with a research assistant. On completing the survey, participants were compensated with a financial incentive consistent with local IRB approvals and standards. All data were entered into an electronic database and were de-identified. The de-identified data were sent to the coordinating site, cleaned, entered into the master database, and stored until all sites completed data collection and entry. Original data were stored at each individual site.

### Measurements

The measures used to assess our variables of interest are listed in the following paragraphs. While participants completed a battery of 16 survey measures, these variables were chosen a priori and based on our hypothesis that social capital and self-compassion would be negatively associated with symptom intensity among PLWH. For sites where participants did not speak English as their native language, appropriate translation procedures were followed.<sup>36</sup>

*Demographic Characteristics and HIV Disease Status.* Demographic characteristics and HIV disease status were measured with a 20-item demographic and illness characteristics instrument. This included age, gender, race, ethnicity, education, income, health insurance, date first learned of HIV diagnosis, self-reported current CD4 count, viral load, HIV medications, and general health.

*HIV Symptom Intensity.* HIV symptom intensity was measured with the 72-item revised Sign and Symptom Checklist.<sup>37,38</sup> This scale measures the number and intensity of symptoms being experienced by PLWH on the day of data collection. This scale has been validated and repeatedly used to assess symptoms in PLWH.<sup>11,38–40</sup> Participants were asked to rate whether they experienced the symptom in the past 24 hours and if so, how intense it was on a 0–3 scale. Zero indicates that a participant did not experience the symptom at all in the past 24 hours, 1 indicates mild intensity symptoms, 2 indicates moderate intensity symptoms, and 3 indicates a severe intensity symptom. Intensity was summed across symptoms, and a higher score indicates higher HIV symptom intensity. The possible range for symptom intensity is 0–216 for women and 0–192 for men (because gynecological symptoms are gender specific). Reliability for all items of the revised Sign and Symptom Checklist for our study was 0.97.

*Self-Compassion.* Self-compassion was measured with the 12-item Brief Version Self-Compassion Inventory.<sup>41</sup> This scale was developed from 26-item inventory by Neff<sup>16</sup> and has demonstrated acceptable psychometric properties. We chose the brief version of the scale to minimize participant burden. Participants were asked to rate how they dealt with 12 difficult situations on a 1–5 scale with a possible range of 12–60. After reverse-scoring negatively worded items, items are summed. Higher scores indicate more self-compassion. Internal consistency reliability for the Brief Self-Compassion Inventory was 0.71, and it demonstrated acceptable internal and external validity in PLWH.<sup>41</sup>

*Social Capital.* Social capital was measured with 31 items from the 36-item Social Capital Scale.<sup>42–45</sup> This

widely used instrument provides a total score and measures eight subscale scores including participation in the local community, social agency, feelings of trust and safety, neighborhood connections, friends and family connections, tolerance of diversity, value of life, and workplace connections. We excluded three workplace connections items and two work-related questions that are part of the social agency dimension. This modification occurred with the approval and recommendation of the scale's original authors because we anticipated high unemployment in our sample. Participants were asked to rate each item on a 1–4 scale with a possible range of 31–124. Higher mean scores indicate more social capital. Reliability and validity of the scale have been reported as acceptable.<sup>42</sup> Reliability for the Social Capital Scale for our study was 0.88.<sup>28</sup>

### Statistical Analysis

All data were entered into a data management program, and data integrity and assumptions were checked. Analyses were conducted in Stata, version 13.1 (StataCorp. LP, College Station, TX), and included descriptive statistics and bivariate correlational analyses including Spearman's rank order correlation. Because of the preponderance of values of zero in 24-hour HIV symptom intensity, zero-inflated Poisson regression modeling was used to assess effects of predictor variables on HIV symptom intensity. In addition to examining our variables of interest (self-compassion, social capital, and age), we controlled for the effect of covariates known to influence the HIV symptom experience (sex, years living with HIV diagnosis, comorbid health conditions, work, and income).<sup>46</sup>

Because of the large sample size, we wanted to minimize the risk of overestimating the significance of our analyses and conducted all analyses on a subsample comprising 28% of the overall sample. The dependent variable (HIV symptom intensity) for the overall sample was reviewed for outliers using the *z* score test method. We removed cases that had a mean symptom intensity score greater than three SDs away from the group mean from the random subsample selection process. The subsample data ( $n = 620$ ) were then reviewed for symptom intensity data completeness, and data from an additional five cases were dropped for incomplete symptom intensity data for a final subsample of 615 participants. Only those cases that had complete data for all variables were included in the regression models, resulting in a final sample of 528.

### Results

A randomly selected subsample of 615 surveys was selected from a total of 2183 participants completing

the survey. In this subsample, approximately 70% were male, 42% were Black/African American, 22% White/Anglo, and over 60% had a high school diploma or less. Most (75%) were unemployed, had health insurance (72%), and reported having at least one comorbid health condition (63%). On average, most participants had been living with HIV for approximately 12 years, were prescribed HIV ART (81%), and had a mean CD4+ T-cell count of 431 cells/ $\mu$ L. The participants reported experiencing an average of 18.7 (SD 13.6) symptoms (range 0–50), with an average total symptom intensity of 30.2 (range 0–147). Participants reported an average score of 39 on the Brief Self-Compassion Inventory (range 12–60) and had an average score of 2.54 on the social capital scale (range 1.2–3.9). Additional demographics and HIV disease characteristics can be found in Table 1.

Using bivariate analyses (Table 2) of relationships among HIV symptom intensity, social capital, self-compassion, and age, we observed significant negative correlations between HIV symptom intensity and social capital ( $\rho = -0.23$ ,  $P < 0.001$ ) and HIV symptom intensity and self-compassion ( $\rho = -0.28$ ,  $P < 0.001$ ). These significant negative associations indicated that as one variable increases (i.e., self-compassion), the other variable is reduced (i.e., symptom intensity). Simply stated, as the reported average level of symptom intensity increases, the average social capital score or the average self-compassion score significantly decreases. We observed no relationship between HIV symptom intensity and age. We also observed a significant moderate relationship between social capital and self-compassion ( $\rho = 0.40$ ,  $P < 0.001$ ).

Zero-inflated Poisson regression analyses were used to assess our model's predictive power to estimate HIV symptom intensity. As zero on the HIV Sign and Symptom Checklist indicates that the participant did not experience the symptom in the previous 24 hours, it was expected that some of the participants would not report any current symptoms; approximately 8% of the sample did not experience any symptoms. Zero-inflated Poisson regression analyses are used to model count data, as is the case with the number and intensity of self-reported symptoms that have an excess in zero counts (i.e., no symptoms). Furthermore, zero-inflated Poisson regression models are easy to interpret, can lead to more refined data analyses by evaluating the excess zeroes that are generated by a separate process from the nonzero count values, and the excess zeroes can be modeled independently.<sup>47,48</sup> The zero-inflated Poisson regression model has two components, a Poisson count model and a logit model for predicting excess zeroes (representing membership in the "no symptom" group).

Table 1  
Demographic and HIV Disease Information

Participant Characteristics	Entire Sample ( <i>n</i> = 2183)		30% Subsample ( <i>n</i> = 655)	
	Frequency (%)	Mean ( $\pm$ SD)	Frequency (%)	Mean ( $\pm$ SD)
Age (yrs)		45.1 (9.5)		44.9 (9.7)
Gender				
Male	1486 (68.7)		453 (69.9)	
Female	623 (28.8)		180 (27.8)	
Transgender	42 (1.9)		12 (1.9)	
Race				
Asian/Pacific Islander	261 (12.1)		75 (11.6)	
African American/black	854 (39.6)		274 (42.3)	
Hispanic/Latino	425 (19.7)		119 (18.4)	
Native American	69 (3.3)		20 (3.1)	
White/Anglo	488 (22.6)		143 (22.1)	
Education level				
11th grade or less	601 (27.7)		192 (29.5)	
High school or GED	804 (37.2)		221 (33.9)	
2 years college/associates degree	461 (21.3)		142 (21.8)	
4 years college/bachelor's degree	224 (10.4)		74 (11.4)	
Master's degree or doctorate	74 (3.4)		23 (3.6)	
Work for pay	538 (24.9)		164 (25.2)	
Has health insurance	1553 (71.6)		468 (71.9)	
Has comorbid health conditions	1323 (64.7)		386 (63.0)	
Self-reported HIV indicators				
Year diagnosed with HIV		1999 (7.6)		1998 (7.6)
Prescribed antiretroviral therapy	1775 (83.4)		514 (80.8)	
Undetectable viral load <sup>a,b</sup>	798 (36.5)		373 (59.1)	
Viral load for those with detectable values/mL <sup>c</sup>		43,032 (109,646)		48,114 (128,333)
CD4 cells/ $\mu$ L		432 (472.8)		431.5 (489.7)
HIV Sign and Symptom Checklist				
Mean frequency of symptoms		18.41 (13.21)		18.74 (13.6)
Mean intensity of symptoms		29.29 (24.50)		30.23 (26.7)
Total self-compassion score		38.7 (7.5)		38.5 (7.7)
Total social capital score		2.6 (0.55)		2.54 (0.55)

GED = General Educational Development.

<sup>a</sup>Subjects were asked if their HIV viral load was undetectable, detectable and report the actual value, or if they do not know their HIV viral load. We calculated those who are undetectable by summing those who reported having an undetectable HIV viral load with those who reported an HIV viral load less than 200 copies per mL and divided that by the total number of participants in the respective column.

<sup>b</sup>Difference between overall sample and subsample statistically significant with a *P*-value less than 0.01.

<sup>c</sup>One hundred eighty-nine subjects in the full data set and 373 subjects in the subsample reported an HIV viral load value greater than or equal to 200 copies per mL. The mean reported is based on those subjects.

When examining these models together, only two variables consistently predicted HIV symptom intensity, being employed and social capital. Being employed was significantly associated with lower symptom intensity ( $\beta = -0.10$ , 95% CI  $-0.14, -0.06$ ) and was associated with an increased likelihood ( $\sim 17\%$ ) of not reporting any symptoms ( $\beta = 1.17$ , 95% CI  $0.38-1.96$ ). Social capital was significantly associated with lower symptom intensity ( $\beta = -0.004$ , 95% CI  $-0.005, -0.003$ ) and was associated with an increased likelihood ( $\sim 5\%$ ) of not reporting any symptoms ( $\beta = 0.05$ , 95% CI  $0.02-0.07$ ). As expected, additional

variables were significant in their respective models (age, comorbidities, years since HIV diagnosis, income, and race; Table 3).

To assess the model fit characteristics, we conducted the Vuong test, which compares the zero-inflated Poisson model to a standard Poisson model.<sup>49,50</sup> Because the *z* value is both positive and significant ( $z = 5.77, \leq 0.001$ ), the Vuong test shows that the zero-inflated Poisson is a better fit than the standard Poisson regression. This is also supported by improved log likelihood fit statistics for the two models showing that the count-only data model has a log likelihood

Table 2

**Bivariate Relationship Between Social Capital, Self-Compassion, Age, and Perceived HIV Symptom Intensity (*n* = 655)<sup>a</sup>**

Participant Characteristics	HIV Symptom Intensity	Social Capital	Self-Compassion
HIV symptom intensity	1.00		
Social capital	-0.23 ( $P < 0.001$ )	1.0	
Self-compassion	-0.28 ( $P < 0.001$ )	0.40 ( $P < 0.001$ )	1.0
Age	0.07 ( $P = 0.08$ )	0.14 ( $P < 0.001$ )	0.15 ( $P < 0.001$ )

<sup>a</sup>The relationships between the variables were not linear; therefore, we used Spearman's rank order correlations tests to analyze these relationships.

Table 3  
Zero-Inflated Poisson Regression Model Predicting HIV Symptom Intensity in the Past 24 Hours

Variable	B Coefficient	SE	z	95% CI	
Poisson count model (for nonzero values of symptom intensity)					
Age	0.003 <sup>a</sup>	0.001	3.37	0.001	0.005
Sex (male)	-0.140 <sup>a</sup>	0.016	-8.63	-0.171	-0.108
Year of HIV diagnosis	-0.001 <sup>a</sup>	0.001	-0.45	-0.003	0.002
Has other comorbid health conditions	0.286 <sup>a</sup>	0.017	16.85	0.253	0.319
Work	-0.099 <sup>a</sup>	0.020	-4.96	-0.139	-0.060
Income	-0.150 <sup>a</sup>	0.011	-13.10	-0.172	-0.127
Race					
Black	-0.287 <sup>a</sup>	0.028	-10.26	-0.342	-0.232
Hispanic	-0.006	0.029	-0.21	-0.063	0.051
White	-0.172 <sup>a</sup>	0.029	-5.95	-0.229	-0.115
Total self-compassion score	-0.001	0.001	-1.03	-0.003	0.001
Total social capital score	-0.004 <sup>a</sup>	0.001	-8.17	-0.005	-0.003
Constant	4.180	0.067	61.99	4.05	4.313
Logit model for predicting membership to "no symptom" group					
Age	-0.011	0.021	-0.51	0.609	-0.053
Sex (male)	0.427	0.449	0.96	-0.445	1.299
Year of HIV diagnosis	-0.090	0.032	-2.78	-0.154	-0.027
Has other comorbid health conditions	0.338	0.419	0.81	-0.483	1.158
Work	1.170 <sup>a</sup>	0.405	2.89	0.376	1.964
Income	-0.335	0.279	-1.20	-0.882	0.211
Race					
Black	-0.120	0.605	-0.20	-1.306	1.066
Hispanic	-2.173 <sup>a</sup>	0.928	-2.34	-3.991	-0.355
White	-1.905 <sup>a</sup>	0.919	-2.07	-3.706	-0.104
Total self-compassion score	0.006	0.026	0.24	-0.044	0.057
Total social capital score	0.048 <sup>a</sup>	0.012	3.92	0.024	0.071
Constant	-4.851	1.802	-2.69	-8.384	-1.319
Vuong test of zero-inflated Poisson regression vs. standard Poisson regression			z	5.77	
			P-value	<0.001	

<sup>a</sup>Indicates a *P*-value less than 0.05.

value of -7428.50, compared with the model using both nonzero and zero values for 24-hour HIV symptom intensity that had a lower (closer to zero) log likelihood of -6878.81, indicating a better fit.

## Discussion

Our analyses of the relationship between self-compassion and social capital and its impact on current HIV symptom experience in adult PLWH yielded several observations that add to existing literature. First, consistent with our hypothesis, we found that social capital is a significant negative predictor of HIV symptom intensity. Our results further indicate that among covariates known to impact HIV symptom intensity, social capital is one of the strongest predictors of HIV symptom intensity. Social resources in the form of social support and social networks have long been recognized as important to symptom management, particularly in chronic disease.<sup>34,51,52</sup> Social capital, while controversial, is a promising construct for better understanding the precise nature of how social resources can improve HIV symptom experience.<sup>53,54</sup> As a modifiable asset of PLWH's social context, social capital can be targeted as a means to improve health-related outcomes in tangible ways.<sup>28</sup> Lewis et al.<sup>55</sup> reviewed the literature and developed a social capital

framework for end-of-life palliative care among terminally ill patients. They argued that social capital was an important construct within the social context of particular populations but also that specificity is needed in its application.<sup>55</sup> By choosing a social capital instrument that has been widely used and extensively validated, we can provide specificity about which domains of social capital were associated with HIV symptom intensity. The social capital scale we used comprises discrete measures of participation in the local community, social agency, feelings of trust and safety, neighborhood connections, friends and family connections, tolerance of diversity, and value of life. Additional research is required because if our results are replicated, the findings can direct us to the components of an intervention to improve symptom intensity based on social capital and its subscales.

An explanation for our findings related to social capital is that the appraisal and interpretation of the HIV symptom experience is likely to be linked to how much someone feels they can readily access the necessary emotional, psychological, and material resources available to them when dealing with physical and psychological symptoms. Consistent with the collective network approach to social capital, these resources can improve health outcomes by influencing health behavior, mobilizing a network to access health

services, and providing emotional and psychological support.<sup>56</sup> Someone who believes they have less access to these resources may interpret his or her symptoms as insurmountable. This may lead them to become emotionally overwhelmed with the experience and less likely to respond to symptom management interventions. Emerging evidence in the field of cognitive neuroscience suggested that there is an antagonistic relationship between emotional neurocognitive processing and analytic neurocognitive processing that, when activated, prevents one from using the other neural system.<sup>57</sup> This may help explain the variable success of evidence-based, efficacious symptom management interventions<sup>58</sup> and is consistent with analysis suggesting that higher social capital mediates limited literacy and health outcomes<sup>59</sup> and improves chronic disease self-management.<sup>60</sup> For example, a person living with HIV who has low social capital may be focused on the emotional distress surrounding their HIV symptom experience and be unable to use the skills taught in symptom management interventions including self-monitoring, knowledge acquisition, and self-regulation. But symptom management interventions that integrate both emotional and analytic neurocognitive processing may be more successful. The mindfulness-based interventions serve as a model of strategies that integrate both emotional and analytic neurocognitive processing. Considered in this context, our results suggest that screening PLWH with high symptom intensity for their perceived social capital may be a useful strategy.<sup>13,14,61</sup> Social capital screening information can then be used to tailor an intervention to the patient's unique social context and may facilitate better targeted HIV symptom management interventions.

We also found a significant, moderate, and positive association between self-compassion and social capital. The relationship between how kind someone is to herself in times of distress and her perceived social resources is intriguing and deserves further study, preferably with a causal research design. However, we did not find a relationship between self-compassion and HIV symptom intensity. As the Brief Self-Compassion Scale is a new instrument, in the future it also may be advantageous to operationalize self-compassion using several tools to ensure optimal assessment. It is possible that either self-compassion or social capital is a condition for the other or they tend to co-vary together. However, we were unable to examine these relationships because of our cross-sectional study design.

Being in paid employment significantly predicted HIV symptom intensity, and this evidence adds to the growing body of literature documenting the positive role of paid employment among PLWH.<sup>29,62–65</sup> However, the relationship between symptoms and employment status is difficult to disentangle in a

cross-sectional study. If PLWH have fewer symptoms, they may be more likely to seek out and engage in paid employment which may explain our findings. However, it is also possible that paid employment allows someone to interpret their symptoms as less intense and bothersome. Paid employment also may afford different opportunities to access health care and other services that may reduce severity of HIV symptoms.

Finally, we did not observe a consistent relationship between age, social capital, and symptom intensity. Once PLWH report symptoms, age was significantly associated with their symptom intensity; however, it was not associated with the likelihood that they did not experience HIV symptoms. This unexpected finding may be related to the limited age range of our sample. With 99% of participants younger than 69 years, we may not have enough older participants to detect associations.

### *Limitations*

In addition to the cross-sectional study design, several limitations should be noted. We used convenience sampling of PLWH from clinics and community organizations. It is possible that symptom intensity, self-compassion, and social capital are different in our sample compared with those in the global population of PLWH. However, our large sample size and random selection of 28% of that sample reduced this risk. Furthermore, many of our study sites were only able to obtain laboratory values via self-report. For this reason, we only provide these data descriptively and did not include them in regression analyses. We also did not include the workplace-related items on the Social Capital Scale. Although only 25% of the participants were employed, this information could have provided additional evidence to help us understand the relationship between employment and symptom intensity. Future work should include these items when using the Social Capital Scale.

Despite these limitations, we found, for the first time, that social capital predicted current HIV symptom intensity as well as demonstrated that individuals with greater social capital were also more likely to have lower symptom intensity or no reported symptoms. Additional research is needed to understand this relationship. A better understanding of how social capital influences HIV symptom intensity can help in the development of targeted and tailored HIV symptom management interventions.

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