



Psychosocial Protective and Risk Factors of Quality of Life Outcomes Among Older Adults Living With HIV

Monique J. Brown^{1,2,3,4} · Daniel Amoatika¹ · Amandeep Kaur¹ · Prince Nii Ossah Addo¹ · Moka Yoo-Jeong⁵

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Abstract

HIV continues to be a public health issue for older adults. Previous studies have examined predictors of quality of life (QoL) among people living with HIV (PLWH), but the majority have been in international settings and have not focused on older adults living with HIV (OALH). The aim of this study was to examine the associations between psychosocial protective and risk factors (resilience, internalized HIV-related stigma, and depression), and overall and domains (physical, psychological, independence, social, environmental, and spiritual) of QoL among OALH. Data were obtained from 156 OALH living in South Carolina. Resilience was positively associated with all QoL domains except the spiritual domain. Internalized HIV-related stigma was associated with all QoL domains except the psychological and environmental domains. Depression was associated with the overall QoL measure and all domains. Interventions aimed at increasing resilience, attenuating internalized HIV-related stigma and depressive symptoms may be warranted for OALH, which may improve overall and varying domains of QoL.

Keywords Resilience · Depression · Stigma · Older adults · Quality of life

Introduction

HIV continues to be a global and national public health challenge and with the improvements in antiretroviral therapy (ART), the proportion of older adults living with HIV (OALH) continues to grow. As of 2020, data show that globally, about 37.7 million people are living with HIV, with majority (36 million) being adults aged 18 and up [1]. In

the same year, 30,635 new HIV diagnoses occurred in the United States, with almost 1.2 million people living with HIV (PLWH) [2]. The overall rate of new HIV diagnoses in the United States has decreased by 9% from 2015 to 2019, but the incidence remains relatively stable for OALH, which may contribute to the growing prevalence among this population [3]. In 2020, over half of PLWH in the US were aged 50 and older (52.7%) [4] with the HIV prevalence estimated at 474 per 100,000 population with the highest rate among people aged 55–59 at 769 per 100,000 population [2, 5]. The advancements in ART have allowed HIV to become a chronic condition with improved quality of life (QoL) [6].

The World Health Organization (WHO) defines QoL as “individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns” [7]. This definition calls for a broader view on the health of people that expands beyond morbidity and mortality. There are specific QoL domains that are measured by the WHO in the brief version of the WHO Quality of Life-HIV Instrument (WHOQOL-HIV-BREF): physical functioning, psychological functioning, independence, social relationships, environment, and spirituality [8]. These domains measure varying aspects of QoL. Physical

✉ Monique J. Brown
brownm68@mailbox.sc.edu

¹ Department of Epidemiology and Biostatistics, Arnold School of Public Health, University of South Carolina, Columbia, SC, USA

² South Carolina SmartState Center for Healthcare Quality, Arnold School of Public Health, University of South Carolina, Columbia, SC, USA

³ Rural and Minority Health Research Center, Arnold School of Public Health, University of South Carolina, SC, Columbia, USA

⁴ Office for the Study on Aging, Arnold School of Public Health, University of South Carolina, SC, Columbia, USA

⁵ School of Nursing, Bouvé College of Health Sciences, Northeastern University, MA, Boston, USA

functioning captures elements such as pain and discomfort and physical symptoms. Psychological functioning refers to aspects such as positive feelings, thinking, learning, memory and concentration. Independence assesses factors including mobility and activities of daily living. Social relationships measure social support and inclusion. Environment captures elements such as physical safety and security, and the home environment. Spirituality measures factors such as personal beliefs, forgiveness and blame [8].

Several studies have examined predictors of QoL among PLWH (not specific to OALH) but mostly in international settings. For example, Shriharsha and Rentala (2019) found that male gender, higher educational attainment and lack of knowledge of mode of HIV transmission were positively associated with QoL among PLWH in Bagalkot, India. However, lower educational attainment, having a wife and children that also live with HIV, HIV attained through male-to-male sexual contact, history of suicidal attempts, and alcohol use were found to negatively predict QoL among this study sample. Depression was also found to be the strongest negative predictor of QoL, after controlling for sociodemographic and clinical covariates [9]. Similarly, in a recent study in Iran, lower educational attainment and higher educational attainment were negatively and positively associated with varying domains of QoL, respectively (i.e., independence, environment, and spirituality) [10]. Being married was positively associated with overall, psychological and social domains of QoL. Drug use was also negatively associated with overall QoL [10].

Nevertheless, research examining these predictors specifically among OALH in the US are scant. One study, which included participants from HIV community organizations in London, found that being partnered and not being on benefits were associated with better QoL among OALH. However, concerns about memory difficulties and mental health factors (i.e., depression and anxiety) were associated with poorer QoL [11]. Similarly, a recent study of OALH has shown that small social network size and depressive symptoms predicted worse emotional domain of QoL [12]. Among all psychosocial variables considered, depressed mood was the strongest predictor of all domains (physical, emotional and social) of QoL that the study considered [12]. However, this study is limited by the fact that it did not assess protective factors like resilience in relation to QoL of OALH and had a narrow focus on QoL domains due to the use of different measure of QoL that is not specific for people living with HIV. Therefore, the aim of this study was to build on the current literature and examine whether psychosocial factors, including resilience, are associated with QoL among OALH in the Southern United States. As cultural context plays an important role in the operationalization of QoL, OALH in the US may have different risk and protective factors of QoL compared to other populations globally. The

current study focuses on resilience, internalized HIV-related stigma and depression, as these are modifiable psychosocial variables that can be targeted through intervention programs to improve overall and specific domains of QoL, especially among OALH (adults aged 50 years and older who are living with HIV).

Methods

Data Source and Study Population

Data were obtained from 156 OALH who were part of a larger study of 402 PLWH. To be eligible for the parent study, participants had to be living with HIV, at least 18 years old, and agreed to take part in a 35–40 min survey. Data were collected from May to September 2018. Participants were recruited from an immunology clinic in South Carolina, which provides comprehensive HIV services [13]. For the current study, we restricted analyses to adults aged 50 and older living with HIV (age range: 50 to 100 years).

The research team coordinated with clinic staff to recruit potential participants. If a patient was interested in the study, they were directed towards a research team member who asked the patient if he/she/they were interested in participating in the anonymous paper-and-pencil survey [14]. More than 80% chose to participate. After providing informed consent, the survey was conducted in a private area of the clinic. Participants were compensated with a \$20 gift card for their participation in the study. Data were collected on sociodemographic characteristics, HIV risk behavior, clinical characteristics such as viral load data via self-report. The study protocol was approved by the University of South Carolina Institutional Review Board.

Measures

Resilience was measured using the 10-item Connor-Davidson Resilience Scale (CD-RISC 10) [15]. Participants were asked to report how they handled stressful events. Examples of items included “adapt to change” and “deal with whatever comes my way.” Each item was scored using a 5-point response option ranging from 0 “Not at all” to 4 “Extremely”. Higher scores reflected greater resilience. The standardized Cronbach’s alpha for this scale in the current study was 0.92.

Internalized HIV-related stigma was measured using the 12-item short version of the HIV Stigma Scale [16, 17]. Participants were asked to report how they felt about living with HIV. Examples of items included “I feel guilty because I have HIV” and “Telling someone I have HIV is risky”. Each item was scored using a 4-point response option ranging from 1 “Strongly disagree” to 4 “Strongly agree”. Higher

scores reflected greater internalized HIV-related stigma. The Cronbach's alpha for this scale in the current study was 0.87.

Depression was measured using the 9-item Patient Health Questionnaire (PHQ-9) [18, 19]. Participants were asked to report their depressive symptoms in the past two weeks. Examples of items included "little interest or pleasure in doing things" and "feeling down, depressed, or hopeless". Each item was scored using a 4-point response option ranging from 0 "Not at all" to 3 "Nearly Every Day". Greater scores reflected greater depressive symptoms. The Cronbach's alpha for this scale in the current study was 0.94.

Quality of Life Domains were measured using the brief version of the WHO Quality of Life-HIV Instrument (WHO-QOL-HIV-BREF), which is a 31-item survey that measures global (i.e., overall) QoL, general health, and six specific QoL domains (i.e., physical functioning, psychological functioning, personal autonomy (independence), social relationships, environment, and spirituality) [8]. Examples of items included: "Do you feel accepted by the people you know?", "How satisfied are you with your personal relationships?" Each item was scored using a 5-point scale ranging from 1 "Very dissatisfied" to 5 "Very satisfied." Higher scores indicated greater QoL. The Cronbach's alpha values for the domains were physical = 0.69; psychological = 0.81; independence = 0.75; social = 0.80; environmental = 0.84; spiritual = 0.59).

Sociodemographic characteristics considered as potential confounders included: gender (men vs. women), age (continuous), race (Black vs. White), ethnicity (Hispanic vs. non-Hispanic), education (\leq high school vs. \geq some college), employment (unemployed vs. employed), and years since diagnosis (continuous). Confounders were considered a priori based on a review of the literature. We considered characteristics that were independent risk factors for QoL, were associated with the risk or protective factor (resilience, internalized HIV-related stigma, and depression), and were not potential mediators of these relationships. For example, gender differences have been shown in QoL where women and men with good physical and psychosocial health but men with higher socioeconomic conditions had better QoL [20]. QoL has also been shown to decrease with older age [21]. Racial/ethnic disparities in QoL also exist where racial/ethnic minority populations tend to report lower physical health-related QoL compared to White populations; but comparable psychological health-related QoL [22]. Among varying populations, type of employment has been shown to be associated with QoL [23, 24]. Higher educational attainment is also associated with better QoL [20]. Time since diagnosis has also been shown to be negatively related to QoL among other patients with chronic conditions such as those diagnosed with diabetes [25] and cancer [26, 27]. Previous research has also shown differences in resilience by employment, educational, and time since diagnosis among

OALH—such that individuals who were employed, had higher educational attainment, and longer time since diagnosis had higher resilience [14]. Similarly, sociodemographic differences have been found in internalized HIV-related stigma where women [28, 29], younger adults [30], populations with lower educational attainment [30, 31], and shorter time since HIV diagnosis [32] tend to report greater stigma compared to men, older adults, individuals with higher educational attainment and longer time since HIV diagnosis, respectively. Racial/ethnic differences may also exist due to cultural differences in the interpretation of stigma [33]. Differences in depression status by gender, age, educational attainment and employment have also been shown [34]. In addition, those who are newly diagnosed with HIV are at higher risk of depressive symptoms compared to long-term HIV survivors [35].

Analytic Approach

Descriptive statistics were used to describe the study population. Simple and multiple linear regression models were used to determine the association between psychosocial factors and QoL (overall and each domain). Multiple linear regression models adjusted for sociodemographic characteristics. All analyses were conducted in SAS version 9.4 (SAS Institute, Cary, NC) with statistical significance set at $\alpha = 0.05$.

Results

Table 1 shows the distribution of sociodemographic characteristics among the study population. The majority of the study population identified their current gender as male (66%), as Black (72%), non-Hispanic (76%), and unemployed (50%). Approximately four in ten attended at least some college (44%). The mean (SD) age was 58.4 (7.8) years and the mean (SD) time since diagnosis was 17.6 (9.5) years.

Table 2 shows the beta estimates and p-values for the association between resilience and the QoL global measure and domains. Unadjusted models showed that resilience was associated with all domains of QoL ($p < 0.05$). Adjusted models found a similar pattern except that the association between resilience and the spirituality domain was not statistically significant ($B = 0.076$; $p = 0.102$).

Table 3 displays the beta estimates and p-values for the association between internalized HIV-related stigma and the QoL global measure and domains. Unadjusted and adjusted models showed that internalized HIV-related stigma was associated with the global measure, physical, independence, social, and spiritual domains ($p < 0.05$). However, there were no statistically significant associations found between

Table 1 Distribution of sociodemographic and clinical characteristics of the study population

	N or Mean	% or SD
Sex assigned at birth		
Male	100	64.1
Female	52	33.3
Missing	4	2.6
Current gender		
Male	103	66.0
Female	53	34.0
Age (Years) (Mean, SD) (Range: 50–100)	58.4	7.8
Race		
Black	112	71.8
White	38	24.4
Missing	6	3.9
Ethnicity		
Hispanic	7	4.5
Non-Hispanic	118	75.6
Missing	31	20.0
Education		
≤ High School	59	37.8
≥ Some College	68	43.6
Missing	29	18.6
Employment		
Employed	47	30.1
Unemployed	78	50.0
Missing	31	20.0
Time since diagnosis (years) (Mean, SD)	17.6	9.5
Viral load		
Undetectable	117	76.9
Detectable	15	9.9
Unknown/missing	24	15.8

Table 2 Association between resilience and quality of life global measure and domains among older adults living with HIV

	Unadjusted B	p-value	Adjusted B ^a	p-value ^a
Global	0.026	0.003	0.028	0.025
Physical	0.198	< 0.001	0.238	< 0.001
Psychological	0.305	< 0.001	0.255	< 0.001
Independence	0.195	< 0.001	0.148	< 0.001
Social	0.198	< 0.001	0.171	0.004
Environmental	0.404	< 0.001	0.319	< 0.001
Spiritual	0.116	< 0.001	0.076	0.102

Bolded estimates and p-values indicate statistical significance at p < 0.05

^aAdjusted for gender, age, race, ethnicity, education, employment, and years since diagnosis

stigma, and the psychological (B = -0.097, p = 0.097) and environmental (B = -0.065, p = 0.410) domains of QoL.

Table 3 Association between internalized HIV-related stigma and quality of life global measure and domains among older adults living with HIV

	Unadjusted B	p-value	Adjusted B	p-value
Global	-0.031	< 0.001	-0.018	0.112
Physical	-0.145	< 0.001	-0.119	0.008
Psychological	-0.063	0.191	-0.097	0.097
Independence	-0.110	0.004	-0.125	0.005
Social	-0.148	< 0.001	-0.150	0.006
Environmental	-0.043	0.511	-0.065	0.410
Spiritual	-0.188	< 0.001	-0.212	< 0.001

Bolded estimates and p-values indicate statistical significance at p < 0.05

^aAdjusted for gender, age, race, ethnicity, education, employment, and years since diagnosis

Table 4 Association between depression and quality of life global measure and domains among older adults living with HIV

	Unadjusted B	p-value	Adjusted B	p-value
Global	-0.046	< 0.001	-0.044	0.004
Physical	-0.344	< 0.001	-0.353	< 0.001
Psychological	-0.354	< 0.001	-0.405	< 0.001
Independence	-0.289	< 0.001	-0.305	< 0.001
Social	-0.286	< 0.001	-0.332	< 0.001
Environmental	-0.413	< 0.001	-0.452	< 0.001
Spiritual	-0.325	< 0.001	-0.341	< 0.001

Bolded estimates and p-values indicate statistical significance at p < 0.05

^aAdjusted for gender, age, race, ethnicity, education, employment, and years since diagnosis

Finally, Table 4 shows the beta estimates and p-values for the association between depression and the QoL global measure and domains. Unadjusted and adjusted models showed that depression was associated with the QoL global measure, and all domains (at p < 0.001 for all models except for p = 0.004 for the adjusted model for global QoL).

Discussion

Quality of life (QoL) is an important health outcome to consider for people aging with multimorbidity, including HIV. Our study aimed to assess psychosocial protective and risk factors associated with QoL among OALH. We found that resilience was associated with overall QoL and all domains except for the spirituality domain. Internalized HIV-related stigma was associated with overall QoL, and all domains except for the psychological and environmental domains. Finally, depressive symptoms were associated with overall and all domains of QoL.

Resilience was associated with all domains except for the spiritual domain in our final adjusted model. The non-statistically significant finding between resilience and the spiritual domain was a surprising finding. For example, positive religious coping has been linked to resilience among PLWH [36]. Another study also found that resilience mediated the relationships between life stress and life quality measures as operationalized by well-being (physical, emotional, and functional/global) among OALH in the US [37]. Therefore, we expected that resilience would play a statistically significant role in the spiritual domain due to previous research linking resilience to higher levels of spirituality [38]. It is possible that we did not find a statistically significant relationship between resilience and the spiritual domain among this study population due to several reasons. There may be differences in how spirituality is operationalized in the current study compared to previous research [38]. In addition, the spiritual QoL domain measured aspects including religion/personal beliefs, forgiveness and blame, and concerns about the future while resilience is defined as adapting to challenging situations [39]. For older adults, resilience and this definition of spirituality may be separate entities. Therefore, resilience among OALH might not impact these aspects of spirituality directly. Another potential explanation is that the spiritual domain may not be a very reliable measure of spiritual QoL among this study population (Cronbach's $\alpha = 0.59$). It is also possible that the relationship between resilience and spirituality QoL is influenced by factors not considered or measured in this study such as cognitive reappraisal and coping self-efficacy [40]. Our findings with resilience being associated with physical, psychological and environmental domains, and the overall QoL align with results from previous studies. Shriharsha and Rentala (2020) found that resilience was significantly correlated with the environmental domain and overall QoL among PLWH in Bagalkot, India [41]. In addition, resilience was associated with the independence and social domains of QoL, which suggests that overcoming adversity is linked to having more autonomy and perceived social support [42], which are indicators of overall good QoL. These results suggest that building resilience among OALH may improve varying facets of QoL.

Internalized HIV-related stigma was associated with all domains of QoL except for psychological and environmental domains. We expected that stigma would be associated with the psychological domain as previous research suggested that internalized HIV-related stigma is linked to varying psychological and social QoL outcomes including depression, anxiety, HIV disclosure concerns, and self-esteem [43]. The lack of a statistically significant association between stigma and environmental QoL could be due to the measurement of internalized stigma. Our findings, nevertheless, showed that internalized HIV-related stigma was associated with

the social QoL domain as was indicated in van der Kooij's study [43]. This type of stigma was also linked to physical, independence and spiritual domain, which suggests that the impact of internalized HIV-related stigma may go beyond the social elements to influence one's physical and spiritual outcomes as well as an individual's autonomy. The findings imply that reduction of internalized HIV-related stigma, which may improve one's negative perception of living with HIV, could be linked to improved specific domains of QoL (physical, independence, social, and spiritual).

The findings from the current study are consistent with previous research, which found that depression was the strongest negative predictor of QoL [9]. In our study, depression was associated with overall and all domains of QoL: physical, psychological, independence, social, environmental, and spiritual. These results align with previous findings [12] and suggest that improving depressive symptoms may help to improve QoL for OALH. Therefore, interventions that are geared towards reducing depression may contribute to improved QoL and all related domains among this population. However, additional longitudinal studies and assessment of causal relationships among these variables are warranted.

There are some limitations to be considered in the current study. The participants in the study were receiving care from an HIV clinic in South Carolina. Therefore, the results seen here might not reflect findings that might be found among PLWH who are not in care. In addition, participants were located in the Southern US and might not be generalizable to other PLWH who are in other regions of the US and/or in international settings. For example, culture may play a role in how psychosocial factors are associated with overall QoL and related domains. Indeed, the WHO defines QoL as an individual's perception of their position in life in the context of one's culture [7] and the culture may be different in the Southern US compared to other regions and international settings. The sample size of 156 was relatively small and these associations should be examined using larger samples of OALH. Although this was a sample of OALH, the mean age was 58.4 years. Therefore, the findings may not be generalizable to a sample of adults of much older ages. The Cronbach's α for the spiritual domain was below 0.70, which reflected low internal reliability among this study population. Nevertheless, the study also had some strengths. We were able to control for sociodemographic characteristics that might alter the association between these psychosocial factors (resilience, depression, and stigma) and QoL outcomes. The study population, with 75% Black participants, reflected the demographics of HIV population in the Southern region. Cronbach's α estimates showed acceptable or high internal reliability of the resilience, stigma, depression measures, and the physical, psychological, independence, social, and environmental domains of QoL [44].

Conclusion

This study found that resilience, internalized HIV-related stigma, and depression were associated with overall QoL and varying domains among OALH in the Southern US. Additional research examining these associations is needed with a larger sample size of OALH and a revised measure assessing spiritual QoL with higher internal reliability. Nevertheless, the findings from the current study show that interventions that are geared towards improving QoL among OALH should consider addressing these psychosocial factors. However, longitudinal studies addressing casual relationships between psychosocial factors and QoL domains are warranted.

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Author Contributions MJB conceived the paper, designed the study and analyzed the data. MJB and DA wrote the first draft of the paper. All authors commented on previous versions of the manuscript.

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Data Availability Data can be obtained by e-mailing Dr. Xiaoming Li (xiaoming@mailbox.sc.edu).

Code Availability Codes can be obtained by e-mailing Dr. Monique J. Brown (brownm68@mailbox.sc.edu).

Declarations

Conflict of interest There are no conflicts of interest to disclose for any author.

Ethical Approval The study was approved by the University of South Carolina Institutional Review Board.

Consent to Participate All participants provided informed consent to participate before participating in the study.

Consent for Publication Participants provided consent to publishing study results.

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