The Association Between Depressive Symptoms, Anger, and Perceived Support Resources Among Underserved Older HIV Positive Black/African American Adults

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Abstract

By 2015, half of those living with HIV in the United States will be ≥ 50 years of age. Research suggests that perceived social support is an important factor in maintaining positive health behaviors in this population. The present study examined the relationship between depressive symptoms and trait anger on perceived social support in a sample of low-income HIV positive (HIV+) African Americans ≥ 50 years of age. Additionally, we examined life stressors moderated the relationship between mental health and perceived support. This study includes 95 HIV+ men and women ≥ 50 years of age who identify as black/African American. As expected, depressive symptoms and trait anger showed a strong inverse relationship with perceived support resources. Furthermore, life stressors also showed a strong inverse relationship with perceived support. However, life stressors did not moderate the relationship between depressive symptoms and anger. Instead life stressors demonstrated a strong independent relationship with perceived support. The association between depressive symptoms, trait anger, life stressors, and lower perceived support suggests that these factors play a role in one's ability to access needed support resources. Greater perceived support is associated with improved health in HIV+ persons, and may be especially important in tailoring interventions for those ≥ 50 years of age.

Introduction

HIGHLY ACTIVE ANTIRETROVIRAL THERAPY (HAART) has reduced HIV/AIDS-related morbidity and mortality, thereby creating a large population of adults ≥ 50 years of age living with the disease. By 2015, half those living with HIV infection in the United States (US) will be ≥ 50 years of age.¹ The rates of HIV/AIDS among persons ≥ 50 years of age are 12 times higher among black/African Americans (blacks) than Whites. Disadvantaged groups, such as racial minorities and substance-using individuals living with HIV/AIDS, experience higher levels of depression, interpersonal conflict, and relationship instability.²⁻⁶ Further, older adults living with HIV have been shown to experience social network insufficiency, which has been associated with poorer health outcomes.⁷⁻¹⁰ As the number of people living with HIV ages, healthcare and public health challenges include: ensuring consistent adherence to the antiretroviral regimen, addressing risk behaviors, and improving quality of life.^{11,12} Extant research suggests that social support, specifically *perceived* support, is an important factor in maintaining

positive health behaviors among those living with HIV/AIDS. Evidence from the stress-buffering hypothesis indicates that an essential component of social support is the perception that others will provide resources when they are needed. Depression and interpersonal conflict have been associated with lower levels of perceived social support.¹³ Greater perceived support has been associated with greater HAART adherence and fewer sex risk behaviors.¹⁴⁻¹⁶ Therefore, it is critical to understand factors influencing perceived support among those aging with HIV, and in particular, among racial minorities. There is a paucity of research examining interpersonal factors, such as social support, and intrapersonal resources, such as mood, which may influence health outcomes in older adults living with HIV who identify as black.

Social support has been shown to play an important role in health behaviors of those coping with HIV.¹⁷ Low levels of social support have been found to interfere with HIV treatment adherence and contribute to drug use and sexual risk behaviors.^{18,19} Mental health issues, such as depressive symptoms, also remain a significant problem for people aging with HIV, with some studies indicating that depression rates

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are as high as 52% in this population.²⁰ Depressive symptoms can also impact medication adherence and other health behaviors among those living with HIV.²¹

Additionally, aging is a complex physical, mental and social process that takes place within social infrastructures such as the medical community, families, and intimate partnerships; this complexity increases when coping with chronic illnesses such as HIV.^{1,22} The aging process itself has been linked to increasing social isolation and depressive symptoms as individuals grow older.²³ Therefore, it is necessary that we examine how mental health and stress affect those aging with HIV. It is particularly important to understand factors affecting the underserved, in order to tailor existing evidenced-based interventions to meet their needs. Among lower income individuals, greater life stressors have been identified as a potential explanation for worse outcomes.²⁴ However, to date, these relationships have not been systematically examined among underserved adults aging with HIV.

The present study sought to (1) examine the relationship between depressive symptoms and anger on perceived social support in a sample of low income HIV positive (HIV+) adults ≥ 50 years of age who identify as black, and (2) further examine if life stressors moderated the relationship between mental health and perceived social support in this population.

Methods

Participants and recruitment

Study participants included 95 HIV+ men and women recruited through the University of Florida Center for HIV/AIDS Research, Education and Service (UF CARES) between October 2013 and January 2014. Located in Jacksonville, Florida, UF CARES provides comprehensive healthcare for HIV-infected individuals and families. This study was approved by the institutional review board of the University of Florida. Eligible participants were HIV+, identified as black/African American, and ≥ 50 years of age. Participants who met the eligibility criteria were approached by clinic staff and given a brief description of the study. After indicating interest, participants received detailed information about the study from a study staff member and provided written informed consent. After study enrollment, participants provided a urine sample and completed an interviewer-administered assessment examining mental and behavioral health functioning in a private room within the UF CARES clinic. Interviewers administered the interview orally and recorded responses on a computer tablet using the Research Electronic Data Capture (REDCap) application. Participants received a \$25 gift card for completing the assessment. Study staff also completed a medical chart review to obtain information on participant health status, including comorbid conditions, CD4 count and viral load.

Measures

Demographics. Study demographics include sex, age, race, marital/partner status, number of children, and clinical indicators of health such as CD4 count and viral load. At the UF CARES clinic, viral load was determined by polymerase chain reaction.

Life stressors. The Life Burdens Scale consists of 42 items that examine the extent to which participants may have

experienced various life stressors in the past month (e.g., financial hardship, legal problems, interpersonal difficulties). Responses were rated on a 1–4 Likert-type scale ranging from 1 (never/ not at all/ not applicable) to 4 (the entire month) reflecting how much each burden had affected the respondent over the past month. All item responses were summed to obtain the total life burdens score, with higher scores indicating higher life stress. Scores on this scale range from 42 to 168.

Anger. The 44-item State-Trait Anger Expression Inventory (STAXI) yields scores for two major subscales related to the experience of anger, State Anger (intensity of anger at the time of administration) and trait anger (general disposition towards Angry Feelings).²⁵ “I feel like yelling at somebody” and “I am quick-tempered” are representative items of the State Anger and Trait Anger subscales, respectively. Both subscales consist of 10 items with four Likert-type scale response options ranging from 1 (not at all) to 4 (very much so), reflecting how much each statement reflects their feelings. Subscale items are summed to reach the total subscale score; sum scores range from 10 to 40, with higher scores reflecting higher levels of anger. The STAXI has been normed on a variety of clinical populations and has shown moderate to good reliability and validity.^{26,27}

Depressive symptoms. The 21-item Beck Depressive symptoms Inventory-II (BDI-II) assesses the severity of depressive symptoms by respondents selecting the statements that best reflect how they have felt in the past 2 weeks. Sum scores range from 0 to 68 with scores 0–9 representing minimal depressive symptoms, scores of 10–16 indicating mild depressive symptoms, scores of 17–29 indicating moderate depressive symptoms, and scores of 30–63 representing severe depressive symptoms.²⁸ The BDI has high test–retest reliability ($\rho=0.93$) and internal consistency ($\alpha=0.91$).^{29,30}

Perceived social support. The Enhancing Recovery in Coronary Heart Disease (ENRICH) Social Support Inventory (ESSI) assesses perceived social support with six Likert-type scale items and one item assessing the presence or absence of a spouse or partner. The five Likert response options range from 1 (none of the time) to 5 (all of the time), and the seven ESSI items are summed for a total score that ranges from 7 to 31, with a higher score reflecting higher perceived support. The test–retest reliability ($\rho=0.94$) and internal consistency ($\alpha=0.88$) are high.³¹

Statistical analyses

Multiple linear regression analyses were conducted to determine if perceived support could be significantly predicted by depressive symptoms and trait anger, and whether life stress moderated these relationships. Assumptions of linearity, normality, and homogeneity of variance were examined for each continuous variable. Pearson correlations assessed the associations between trait anger, depressive symptoms, and perceived support. Life stress was dichotomized using a median split, and its association with trait anger, depressive symptoms, and perceived support was assessed using Student's *t* test. Separate hierarchical linear regressions were performed to evaluate the predictive value of

trait anger and depressive symptoms on perceived support, and to assess the moderating effect of life stress. Each continuous independent variable was centered, and the cross-product of each centered independent variable with life stress was computed to obtain the interaction term. In each model, sex, income, and years since HIV diagnosis were entered on the first step. Life stress and the centered continuous independent variable were entered on the second step, and the interaction term was entered on the third step. The presence of outliers was screened using Studentized residuals (>3) and Mahalanobis distance (with $p < 0.001$). Two regression outliers were identified and excluded from analysis.

Results

All participants identified as African American or black (Table 1). The mean age of the sample was 55.74 years ($SD = 5.38$; range: 50–76 years), and 63.1% was female. The majority of the sample (85.26%) reported incomes of $< \$20,000$ /year. The average number of years since HIV diagnosis was 14.83 years ($SD = 10.63$; range: 0–32 years). Participants reported an average number of 6.37 ($SD = 2.80$) medical comorbidities, and based on medical chart abstraction, 28.6% of the sample had a detectable viral load (>50 copies of viral RNA) with an average CD4 cell count of 533.15 ($SD = 275.76$).

To test the hypothesis that perceived support is a function of depressive symptoms, and more specifically whether life stress moderates the relationship between depressive symptoms and perceived support, a hierarchical multiple regression analysis was conducted. The overall model was significant: $R^2 = 0.263$, $F(6, 83) = 5.93$, $p < 0.001$. In the first step, the covariates sex, income, and years since HIV diagnosis were included. These variables did not account for a significant amount of variance in perceived support; $R^2 = 0.010$, $F(3, 83) = 0.74$, $p = 0.53$. In the second step, depressive symptoms and life stress were

included. These variables accounted for a significant amount of variance in perceived support – $R^2 = 0.264$, $F(5, 83) = 6.96$, $p < 0.001$ – and both variables were significant predictors of perceived support. The interaction term was entered in the third step of the regression, and it did not account for a significant amount of additional variance. Further, the interaction term was not a significant predictor of perceived support.

A separate hierarchical multiple regression analysis was performed to assess whether trait anger predicts perceived social support and whether life stress moderates this relationship. Covariates were entered in the first step, and trait anger and life stress were entered in the second step. Trait anger and life stress accounted for a significant amount of variance in perceived support: $R^2 = 0.212$, $F(5, 84) = 5.53$, $p < 0.001$. Life stress – $b = -4.59$, $t(84) = -4.06$, $p < 0.001$ – was a significant predictor of perceived social support, although trait anger was not. The cross-product of trait anger and life stress was added in the third block. The interaction term was not a significant predictor of perceived support: $b = 0.24$, $t(84) = 1.33$, $p = 0.19$. The addition of the interaction term also did not contribute appreciably to additional explained variance ($R^2 = 0.220$) (Tables 2 and 3).

Discussion

The importance of social relationships in the treatment of disease and in the maintenance of health and well-being has been studied across a wide variety of disciplines. Perceived social support has been identified as a key resource for chronically ill populations, such as those aging with HIV. The present study was conducted to examine the relationship between depressive symptoms and trait anger on perceived support resources, and to examine the extent to which life stressors moderated these relationships in older underserved HIV+ adults who identified as black. As expected, depressive symptoms and trait anger showed a strong inverse relationship with perceived social support resources. In addition, life stressors also demonstrated a strong inverse relationship with perceived social support. However, life stressors did not moderate the relationship between mental health outcomes of depressive symptoms and anger as hypothesized. Instead, life stressors demonstrated a strong independent relationship with decreased perceived social support.

The association between depressive symptoms and perceived social support suggests that depressive symptoms may play a significant role in one's ability to access support resources. This is significant, because greater perceived supportive resources are key factors for greater HAART adherence, lower substance use, and better health outcomes such as greater CD4 count among HIV+ adults. Previous studies have found that depressive symptoms may interfere with people's ability to interact with their support network and/or perceive the available resources in their environment.^{32,33} Prior research suggests that depressive symptoms may also be associated with strains in main supportive relationships, and that this stress may threaten the effectiveness or continuity of needed support.^{34–36} An important finding underscoring the significance of this work is that depressive symptoms among older, chronically ill populations are also associated with transition from informal community-based care by family and friends to institutionalization.³⁷ It appears that the relationship between social support and depressive

TABLE 1. DEMOGRAPHICS

Sex % female (<i>n</i>)	63.16% (60)
Age mean (SD)	55.78 (5.26)
Race % African American (<i>n</i>)	100% (95)
Marital status % (<i>n</i>)	
Single, never married	50.53% (48)
Divorced	25.26% (24)
Separated	6.32% (6)
Widowed	7.37% (7)
Married or partnered	10.53% (10)
Do you have children?	75.79% (72)
Living with a partner % (<i>n</i>)	14.74% (14)
Number of medical comorbidities, mean (SD)	
Annual household income % (<i>n</i>)	
<10,000	49.47% (47)
10,000–14,999	23.16% (22)
15,000–19,999	12.63% (12)
20,000–24,999	2.11% (2)
>25,000	3.16% (3)
Declined	9.47% (9)
HIV-related variables, mean (SD)	
Years since diagnosis	14.83 (10.63)
CD4 count	533.15 (275.76)
Detectable viral load	28.6%
Self-reported nonadherence % (<i>n</i>)	15.79% (15)

TABLE 2. HIERARCHICAL REGRESSION ANALYSIS FOR DEPRESSIVE SYMPTOMS PREDICTING PERCEIVED SUPPORT ($N=95$)

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Sex	1.28	1.29	0.11	1.74	1.11	0.15	1.75	1.11	0.15
Income	0.33	0.66	0.06	0.24	0.57	0.04	0.28	0.57	0.05
Years since HIV diagnosis	-0.05	0.64	-0.09	-0.01	0.06	-0.02	-0.02	0.06	-0.03
Depressive symptoms				-0.24	0.81	-0.31 ^b	-0.30	0.11	-0.39 ^b
Life stress				-3.70	1.18	-0.33 ^b	-3.84	1.20	-0.34 ^b
Depressive symptoms $\times$ life stress							0.15	0.16	0.13
R^2		0.01			0.264			0.263	
<i>F</i>		0.74			6.96 ^b			5.93 ^b	

"Depressive symptoms" was centered at its mean.

^a $p < 0.05$; ^b $p < 0.01$.

symptoms are important factors that can be used to improve quality of life and inform interventions among underserved minorities aging with HIV.

The stress-buffering hypothesis suggests that perceived support resources are particularly relevant for those under greater stress, such as low income chronically ill minority populations.¹³ For the current sample, these resources may be even more important because of the complexity of the aging process. Similar to other aging populations, the current sample has a large number of comorbidities as expected, which is often accompanied by greater life stressors and greater negative effect.

Life stressors are thought to put individuals' health at risk; however, perceived social support has consistently demonstrated a protective effect during times of stress. The perception that others will provide resources when needed has been identified as the key to stress buffering; whether or not one actually receives support appears less important for health and adjustment. Research has documented that those aging with HIV tend to have limited and/or inadequate social networks.^{1,9,17,38} Such isolation has been linked to high levels of loneliness and depression and insufficient instrumental and emotional support.³⁹ Although stressors did not moderate the relationship as hypothesized, the strong inverse relationship between perceived support and stressors suggests that stress management is a needed intervention for this population. Therefore, it is imperative that we tailor interventions to address the needs of older HIV+ adults who identify as black.

Little work has been done to examine the influence of anger on health outcomes in this population. However, the present study indicates that anger has a similar influence on the perception of available support resources as do depressive symptoms. This suggests that more work examining the influence of anger on support resources is vital to the needs of this population, which may be important when developing interventions.

To date, few studies have focused on understanding the factors influencing support resources among older HIV+ adults who identify as black. However, results of this study must be considered in light of its limitations. First, the present study did not examine other stressors such as perceived discrimination, stigma, and medical mistrust, which have been shown to influence mental health outcomes.⁴⁰⁻⁴² These constructs were beyond the scope of the present study, and are important areas of future research with this population. Second, although the current study data is cross sectional and causation cannot be determined, these findings provide a closer examination of factors influencing the perception of support resources in this population. Despite the limitations of a cross-sectional design, the current study provides a first step in examining how social support interacts with the aging process among those living with HIV. To our knowledge, this is the first study to show the association between greater depressive symptoms, trait anger, and lower perceived support resources among older HIV+ adults who identify as black. Future research should focus on understanding how social support resources can be used to tailor

TABLE 3. HIERARCHICAL REGRESSION ANALYSIS FOR TRAIT ANGER PREDICTING PERCEIVED SUPPORT ($N=95$)

Variable	Model 1			Model 2			Model 3		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Sex	1.25	1.28	0.11	1.40	1.11	0.15	1.46	1.13	0.13
Income	0.25	0.62	0.05	0.20	0.57	0.04	0.23	0.55	0.04
Years since HIV diagnosis	-0.05	0.63	-0.08	-0.01	0.06	-0.02	-0.01	0.06	-0.02
Trait anger				-0.17	0.09	-0.19	-0.28	0.12	-0.31 ^a
Life stress				-4.59	1.13	-0.41 ^b	-4.69	1.13	-0.42 ^b
Trait anger $\times$ life stress							0.24	0.18	0.18
R^2		0.01			0.212			0.220	
<i>F</i>		0.69			5.53 ^b			4.94 ^b	

Trait anger was centered at its mean.

^a $p < 0.05$; ^b $p < 0.01$.

interventions for older HIV + adults who identify as black, to promote successful aging in this population.

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Author Disclosure Statement

No competing financial interests exist. All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all patients for being included in the study.

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