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Main and Interactive Effects of Emotion Dysregulation and HIV Symptom Severity on Quality of Life among Persons Living with HIV/AIDS

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Abstract

HIV symptoms are associated with a poorer quality of life (QOL) among persons living with HIV/AIDS (PLWHA). Yet, there is little understanding of emotional factors that impact the relation between HIV symptom severity and QOL. The present study examined the main and interactive effects of emotion dysregulation and HIV symptom severity on multiple indices of QOL, including physical (impact of physical problems related to HIV), psychological (frequency of negative feelings), independence (necessity of medical treatment to function in daily life), social (feelings of acceptance), environmental (satisfaction with living conditions and medical care) and spiritual (fear of the future; fear of death) among a sample of 74 PLWHA. Participants (72.9% male; $M_{age} = 48.24$, $SD = 7.85$) were recruited from AIDS Service Organizations in the United States. Results indicated that higher HIV symptom severity is significantly associated with lower physical and independence QOL, whereas higher emotion dysregulation is significantly associated with lower scores on all measured aspects of QOL. Additionally, results indicated that the interaction of emotion dysregulation and HIV symptom severity was significantly associated with both physical and environmental QOL. The form of the observed significant interactions indicated that HIV symptom severity was related to poorer QOL among those with lower (versus higher) emotion dysregulation. The present findings indicate that emotion dysregulation is related to QOL among PLWHA and may interact with HIV symptom severity to negatively impact certain aspects of QOL. Given the profound impact that HIV has on QOL, this finding is important in understanding these relations mechanistically, and may be important in the development of novel psychological treatment strategies.

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Introduction

Quality of life (QOL) is a multi-faceted index of physical, mental, and social well-being (Cleary et al., 1993). The WHO suggests that there are six facets of QOL particularly important among persons living with HIV (PLWHA) including: physical (impact of physical problems related to HIV), psychological (frequency of negative feelings), independence (necessity of medical treatment to function in daily life), social (feelings of acceptance), environmental (satisfaction with living conditions and medical care) and spiritual (fear of the future, death). A large corpus of research suggests that living with HIV/AIDS affects QOL, presumably due to the life stress associated with the disease (Pedersen et al., 2015).

A consistent correlate of QOL among PLWHA is HIV symptom severity. As a result of HIV infection, persons living with this disease often experience a wide range of bodily sensations and aversive interoceptive perturbation including: fatigue, chills, dizziness, pain or numbness, diarrhea, and sleep difficulties (Justice et al., 2001). The vast majority of research suggests HIV symptom frequency and severity is negatively related to QOL (Sousa, Kwok, Schmiege, & West, 2014; Vyavaharkar, Moneyham, Murdaugh, & Tavakoli, 2012). Previous work has linked HIV symptom severity to more narrow measurements of QOL (e.g., health-related quality of life; Lalanne et al., 2015), but has not yet reflected the multi-component nature of QOL.

Beyond HIV symptom severity, there is an increasing recognition that how one responds to emotional distress may impact QOL. One variable that may help to explain differences in QOL among PLWHA is emotion dysregulation, defined as difficulties in the self-regulation of affective states and difficulties in self-control over affect-driven behaviors (Brandt, Gonzalez, Grover, & Zvolensky, 2013; Johnson, Farris, Schmidt, & Zvolensky, 2012; Mennin, Heimberg, Turk, & Fresco, 2005). Research on emotion dysregulation among PLWHA has indicated that emotion dysregulation is related to increased anxiety and depressive symptoms (Brandt, Zvolensky, & Bonn-Miller, 2013), and additionally has been shown to moderate the impact of depression on HIV-relevant outcomes (Brandt, Bakhshaie, Zvolensky, Grover, & Gonzalez, 2015). However, no research has examined emotion dysregulation in relation to QOL among PLWHA.

From the present theoretical framework, higher HIV symptom severity may be exacerbated by an individual's lack of emotion regulatory skills. Conversely, an individual's emotion regulatory processes may become more dysregulated in the context of elevated levels of HIV symptom severity. Therefore, these processes may theoretically function synergistically to be related to a lower QOL.

Together, the present investigation sought to test the main and interactive effects of HIV symptom severity and emotion dysregulation in terms of multifaceted QOL dimensions among PLWHA. It was predicted that higher levels of HIV symptom severity and emotion dysregulation each would independently be associated with lower QOL in each of six domains commonly examined among PLWHA: physical, psychological, independence, social, environmental, and spiritual. Additionally, it was hypothesized that greater degrees of HIV symptom severity when co-occurring with higher levels of emotion dysregulation

would be related to lower QOL. It was hypothesized that all results would be observed above and beyond gender, education, age, race, sex, and time living with HIV.

Method

Participants

Cross-sectional data were taken from the intake session of a larger study examining the effects of anxiety therapy on antiretroviral therapy adherence among PLWHA conducted in an urban setting in Houston, Texas. Eligible participants were between 18 and 65 years old, had a self-reported diagnosis of HIV/AIDS, and had the ability to provide informed written consent. Participants were excluded if they did not have sufficient command of the English language, were non-literate, or had an actively interfering mental health condition (e.g., untreated bipolar, psychosis). For the current study, data from 85 PLWHA were gathered, and 11 cases were excluded due to missing or unusable data. Thus, 74 cases were examined. The sample was largely male (72.9%) and racially diverse: 53.3% African American, 36.0% White. Additionally, 58.7% of the sample identified as a sexual minority (i.e., gay/lesbian, bisexual). Although 88% reported obtaining at least a high school education, 73.3% reported unemployment, and 82.4% earning less than \$20,000 annually. Participants self-reported their most recent CD4 T-cell count ($M = 546.69$, $SD = 270.75$, $range = 28-1300$). Participants were screened for presence of psychopathology; 56% met criteria for at least one anxiety disorder, and 46.7% met criteria for at least one mood disorder as per DSM-IV-TR criteria (APA, 2000).

Measures

Demographic data (e.g., sex, age, income) and medical information (e.g., HIV/AIDS status, CD4 T-cell count) were self-reported by participants.

AIDS Clinical Trials Group Symptoms Distress Module (ACTG-SDM; Justice et al., 2001)—The ACTG-SDM is a 20-item self-report measure on which respondents indicated, on a 5-point Likert-type scale (0 = *I do not have this symptom* to 4 = *It bothers me a lot*), the extent to which they experience and are distressed by 20 symptoms commonly associated with HIV (e.g., muscle aches, nausea, headaches). This scale has demonstrated good construct validity with relations to physical and mental health-related QOL independent of disease state (Justice et al., 2001) and evidenced good internal consistency in the current sample (Chronback $\alpha = .93$).

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004)—The DERS is a 36-item self-report measure on which respondents indicate, on a 5-point Likert scale (1 = *almost never* to 5 = *almost always*), difficulties with emotion regulation (e.g., “When I’m upset, I lose control over my behaviors”). The DERS has been used in previous studies using the HIV/AIDS population (Brandt et al., 2013; Leyro, Vujanovic, & Bonn-Miller, 2014). For the current study, internal consistency was excellent ($\alpha = 0.92$).

World Health Organization Quality of Life HIV (WHOQOL-HIV-Bref; O’Connell & Skevington, 2012)—The WHOQOL-HIV-Bref is a 31-item self-report measure on which

participants indicate, on a 5-point Likert scale, their perceived QOL as it relates to their HIV (The WHOQOL Group, 1998). The WHOQOL-HIV-Bref measures six different domains: physical (e.g., “Do you have enough energy for everyday life?”), psychological (e.g., “How satisfied are you with yourself?”), independence (e.g., “How well are you able to get around?”), social (e.g., “How satisfied are you with your personal relationships?”), environment (e.g., “How safe do you feel in your daily life?”), and spiritual (e.g., “To what extent do you feel your life to be meaningful?”) with higher scores indicating higher QOL. For the current study, each domain was used, indexing adequate to good reliability (Cronbach’s Alpha’s = .68–.80).

Procedures

Study procedures were compliant with the Institutional Review Board at the University of Houston. Participants were recruited via flyers hung at local AIDS Service Organizations, and interested persons who called the laboratory were scheduled for an in-person intake assessment. Participants were compensated \$20 in gift cards to a local grocery store.

Data Analytic Strategy

First, bi-variate correlations were conducted to examine associations between study variables (See Table 1). Then, a series of hierarchical linear regressions were conducted. Because both HIV symptoms and emotion dysregulation were scaled, both were mean-centered so that their unstandardized coefficients would be interpretable (Cohen, Cohen, West, & Aiken, 2003; Hayes, 2013). For each dependent measure, study covariates (i.e., gender, education, age, race, sex, and time living with HIV) were entered in step 1 of a hierarchical linear regression, followed by the mean-centered values for HIV symptoms and emotion dysregulation, and their interaction in step 3. In order to control for alpha inflation due to the large number of analyses conducted, a Holm-Bonferroni correction was utilized (Holm, 1979).

Visualization of any significant interaction was done by estimating the regression line at specific values of HIV symptoms and emotion dysregulation and setting each covariate equal to its mean. The PROCESS macro, facilitated the visualization by producing the values needed to plot the 10th, 25th, 50th, 75th, and 90th percentiles of the distribution (Hayes, 2013). Finally, to probe the interaction, regions of significance were determined using the Johnson-Neyman technique (Bauer & Curran, 2005; Spiller, Fitzsimons, Lynch, & McClelland, 2013) as calculated by the PROCESS macro (Hayes, 2013). The Johnson-Neyman technique estimates the exact values that will yield the critical value used to determine significance (Bauer & Curran, 2005).

Results

Descriptive statistics and correlations among study variables are presented in Table 1. HIV symptom severity and emotion dysregulation were both significantly associated with lower indices of all six sub-facets of QOL (r 's range from $-.25$ to $-.64$; p 's range from $.03$ to $< .001$). HIV symptom severity and emotion dysregulation were significantly correlated ($R = .$

48, $p < .001$). Finally, all subscales of the WHOQOL-HIV-Bref were significantly correlated (range of R 's = .37 – .68, all p 's < .001).

See Table 2 for all model statistics and all variable effects. Regarding physical QOL, the covariates entered in the first step of the model accounted for 7.6% of total variance ($r^2 = .08$; $F[6, 68] = 0.94$, $p > .05$). In step 2, significant main effects were observed for both HIV symptom severity ($\beta = -.35$; $t = -3.37$, $p = .001$) and emotion dysregulation ($\beta = -.48$; $t = -4.83$, $p < .001$) accounting for an additional 43.8% of variance. In step 3, the interaction term was not significant.

In terms of psychological QOL, the covariates entered in the first step of the model accounted for 4.8% of total variance ($r^2 = .048$; $F[6, 68] = 0.57$, $p > .05$). In step 2, significant main effects were observed for emotion dysregulation ($\beta = -.49$; $t = -4.09$, $p < .001$), but not HIV symptom severity. In step 3, the interaction of HIV symptom severity and emotion dysregulation was significant ($\beta = .29$; $t = 2.56$, $p = .01$), adding an additional 6.3% of variance. The Johnson-Neyman technique showed a transition to non-significance at scores above 79.15 (40th percentile). For scores below 79.15 on the DERS increases in HIV symptom severity were associated with decreases in psychological QOL. However, when DERS scores were above 79.15, HIV symptom severity was not significantly associated with psychological QOL (see Figure 2).

For independent QOL, the covariates entered in the first step of the model accounted for 3.6% of total variance ($r^2 = .036$; $F[6, 68] = 1.46$, $p > .05$). In step 2, significant main effects were observed for both HIV symptom severity ($\beta = -.36$; $t = -3.18$, $p = .002$) and emotion dysregulation ($\beta = -.35$; $t = -3.19$, $p = .002$) accounting for an additional 31% of variance. In step 3, there was no significant interaction.

Regarding social QOL, the covariates entered in the first step of the model accounted for 4% of total variance ($r^2 = .040$; $F[6, 68] = 0.47$, $p > .05$). In step 2, there was a significant main effect for emotion dysregulation ($\beta = -.37$; $t = -3.08$, $p < .01$) but not HIV symptom severity ($\beta = -.26$; $t = -2.06$, $p = .04$) due to the Holm-Bonferroni correction, which set p at .025 for significance for this relation. These main effects accounted for an additional 25.5% of variance. There was no significant interaction.

In terms of environmental QOL, the covariates entered in the first step of the model accounted for 6.7% of total variance ($r^2 = .07$; $F[6, 68] = 0.81$, $p > .05$) with no significant variables. In step 2, significant main effects were observed for emotion dysregulation ($\beta = -.34$; $t = -2.61$, $p = .01$), but not HIV symptom severity; accounting for an additional 11.8% of variance. In step 3, the interaction of HIV symptom severity and emotion dysregulation was significant ($\beta = .35$; $t = 2.80$, $p < .01$) adding an additional 8.8% of variance. The Johnson-Neyman technique showed a transition to non-significance at scores above 70.03 (34.67th percentile) and below 140.50 (94.67th percentile). For scores between 70.03 and 140.50 on the DERS, increased HIV symptom severity was associated with decreased in environmental QOL. However, when DERS scores were outside of this range, HIV symptom severity was not significantly associated with environmental QOL (see Figure 5).

Regarding spiritual QOL, the covariates entered in the first step of the model accounted for 6.3% of total variance ($r^2 = .06$; $F[6, 68] = 0.76$, $p > .05$) with no significant variables. In step 2, significant main effects were observed for emotion dysregulation ($\beta = -.57$; $t = -5.19$, $p < .001$), but not HIV symptom severity; accounting for an additional 34.7% of variance. In step 3, the interaction of HIV symptom severity and emotion dysregulation was not significant.

Discussion

The present study examined the main and interactive effects of emotion dysregulation and HIV symptom severity on multiple facets of QOL among PLWHA. The present data only partially supported the relations between HIV symptom severity and QOL indices. Specifically, across all facets of QOL, higher HIV symptom severity was significantly *correlated* with lower QOL. However, higher HIV symptom severity was only significantly associated with lower physical and independence QOL.

We found novel empirical evidence that emotion dysregulation was negatively related to all measured aspects of QOL among PLWHA. These results are consistent with past work focused on the relation between emotion dysregulation and adverse mental health and poorer medication adherence among PLWHA (Brandt et al., 2013, 2015), and extend this work by providing some initial evidence of the impact of this individual difference construct in terms of a broad array of QOL indicators. Importantly, the observed emotion dysregulation effects for QOL dependent measures was evident in the context of HIV symptom severity as well as a range of theoretically-relevant covariates.

Exploration of the interactive effects of emotion dysregulation and HIV symptom severity in terms of QOL yielded a somewhat unexpected patterns of results. Specifically, the interaction of HIV symptom severity and emotion dysregulation was significantly related to psychological and environmental QOL, but not physical, independence, social, or spiritual QOL. The pattern of the significant interactions were also unexpected. In the case of psychological QOL, for individuals indicating lower emotion dysregulation, increased HIV symptom severity was related to lower QOL. The inverse was not significant (see Figure 2). As an illustrative example, when emotion dysregulation is low, HIV symptom severity seems to have a significant impact on psychological QOL; however, when emotion dysregulation is high symptom severity does not have a significant impact on psychological QOL. It is possible that emotion dysregulation maintains such a robust relation with psychological QOL that it may “wash out” the effects of HIV symptoms. In the case of environmental QOL, a somewhat similar pattern emerged. Specifically, when emotion dysregulation was in a moderate range, but not high or low, increased HIV symptom severity was associated with decreased QOL (see Figure 5). It is possible that lower levels of emotion dysregulation may serve as a protective factor against other stressors (e.g., HIV symptom severity) in terms of environmental QOL whereas very high levels of emotion dysregulation may have such a significant impact on environmental QOL that other factors (e.g., HIV symptoms) are unable to show significant relations.

Although not the primary aim of the investigation, it is also noteworthy that emotion dysregulation and HIV symptom severity were moderately associated with one another at the zero-order level (less than 5% shared variance). Therefore, these two factors, as originally theorized (Brandt et al., 2013), are tapping different, albeit related, types of vulnerability processes for QOL.

There are a number of interpretative limitations of the present study. First, the present study utilized a cross-sectional design disabling causal inferences. Second, self-report measures were utilized as the assessment methodology, producing inherent limitations. Third, although the sample was highly diverse in terms of race and ethnicity, it was limited to an older adult, primarily male group of individuals. Finally, the present investigation was based on community-recruited PLWHA and may not be generalizable to other settings.

Overall, the main implication of the present main and interactive findings is that while both HIV symptom severity and emotion dysregulation may impact QOL among PLWHA (Brandt et al., 2013; Lalanne, 2015), they do not act in an identical fashion or exerts similar effects. In fact, the current results suggest that, when examined in the same overarching model, emotion dysregulation represents a more powerful variable in relation to many QOL facets. From a health promotion standpoint, it may therefore be more practically productive to identify PLWHA with high levels of emotion dysregulation as a high-risk group for low QOL. Furthermore, the therapeutic targeting of emotion dysregulation among this population may have substantial clinical utility.

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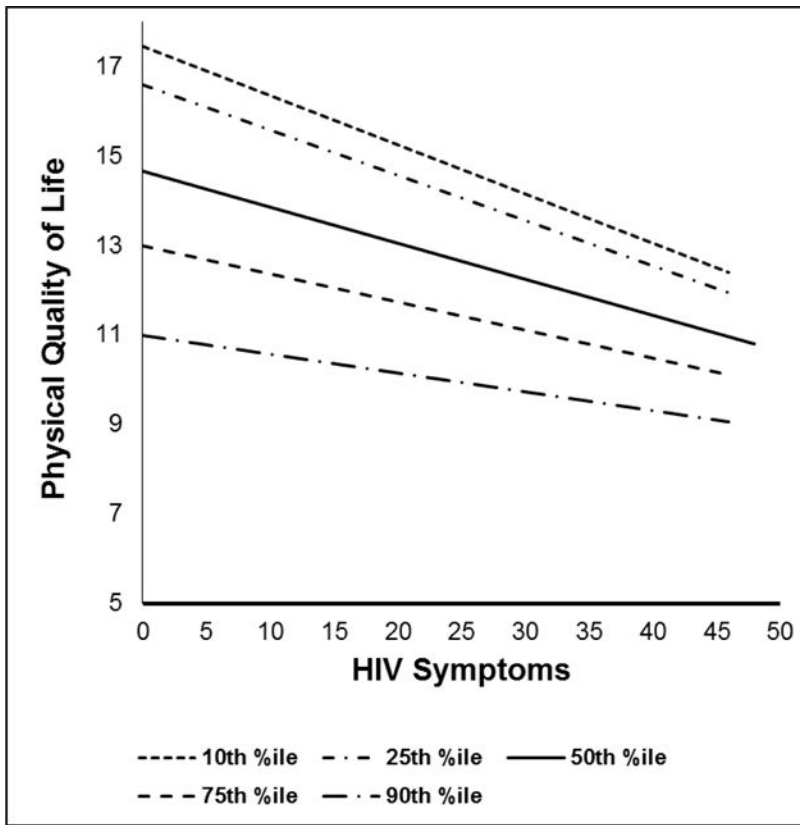


Figure 1. Main and interactive effects of HIV symptoms and emotion dysregulation on Physical QOL

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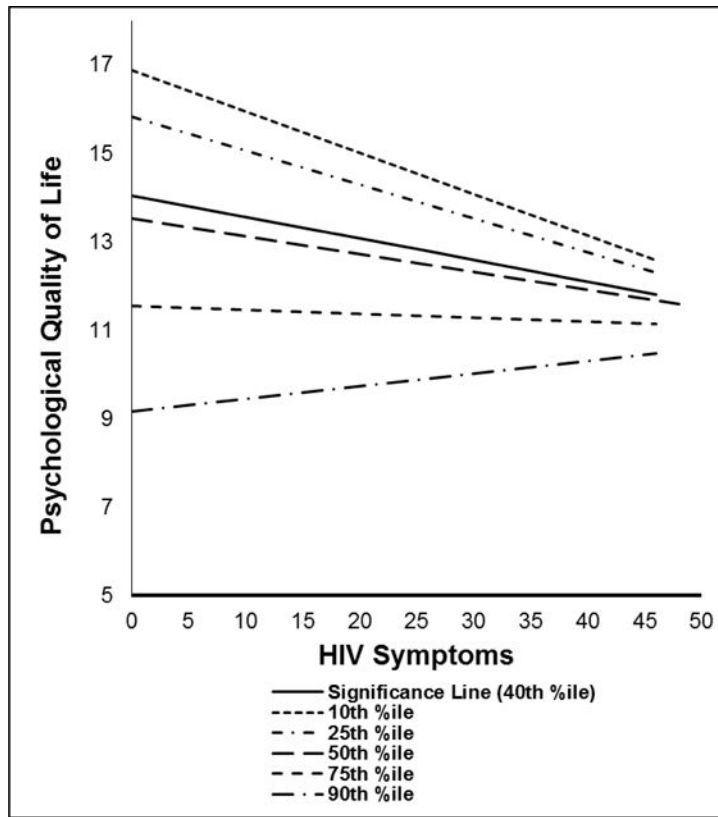


Figure 2. Main and interactive effects of HIV symptoms and emotion dysregulation on Psychological QOL

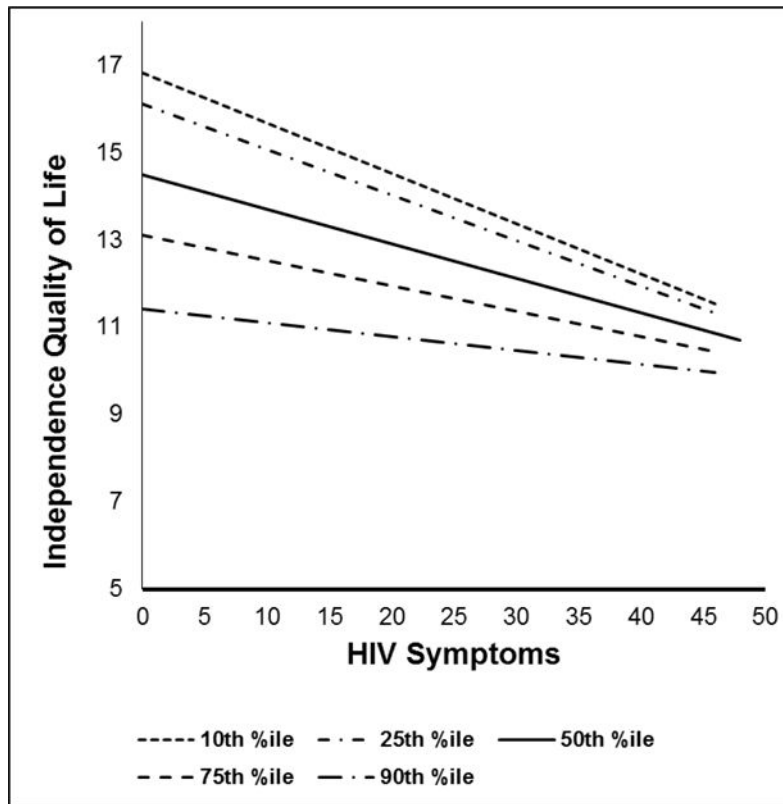


Figure 3. Main and interactive effects of HIV symptoms and emotion dysregulation on Independence QOL

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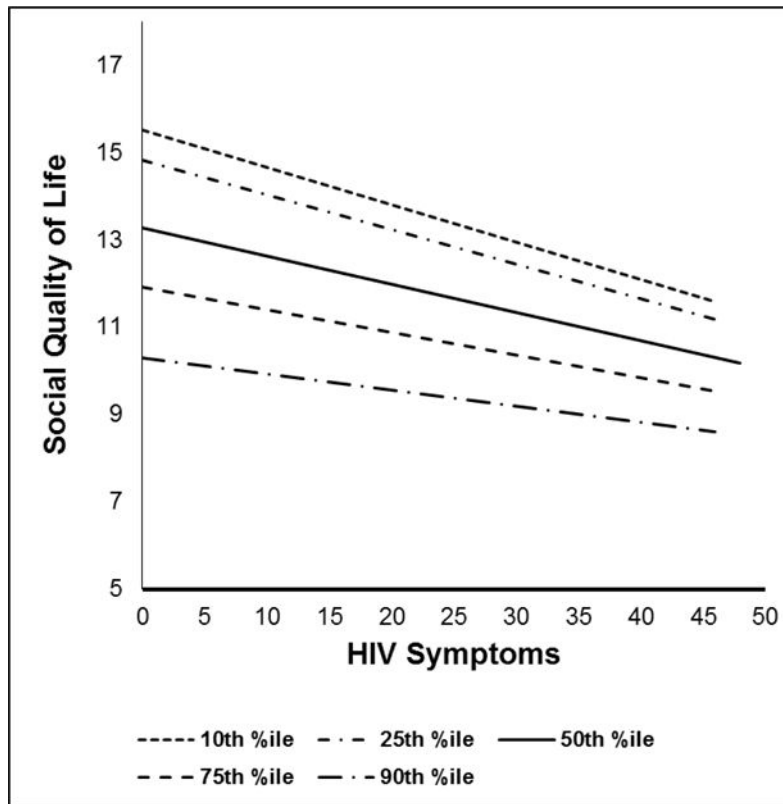


Figure 4. Main and interactive effects of HIV symptoms and emotion dysregulation on Social QOL

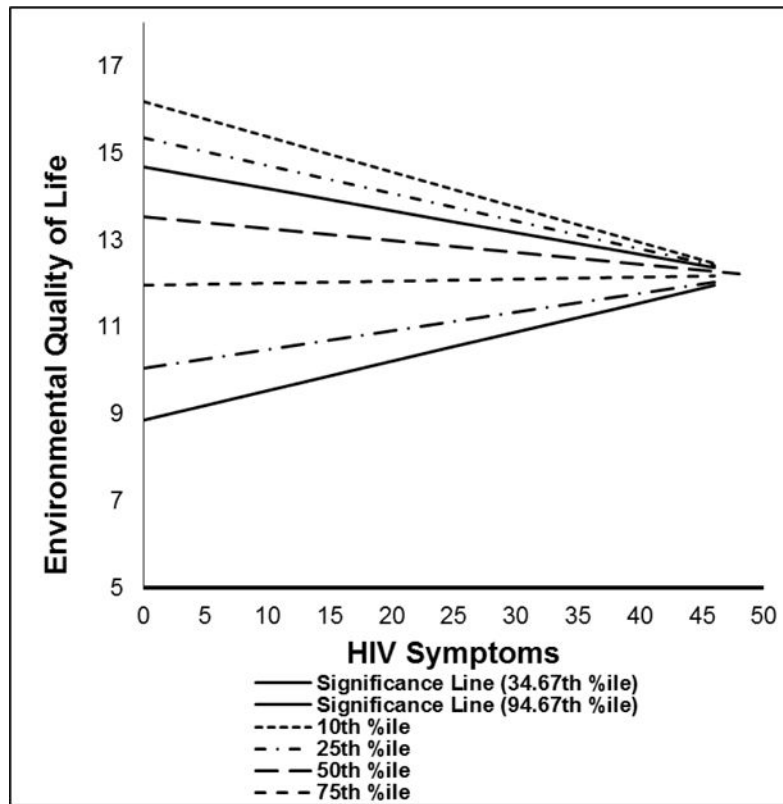


Figure 5. Main and interactive effects of HIV symptoms and emotion dysregulation on Environmental QOL

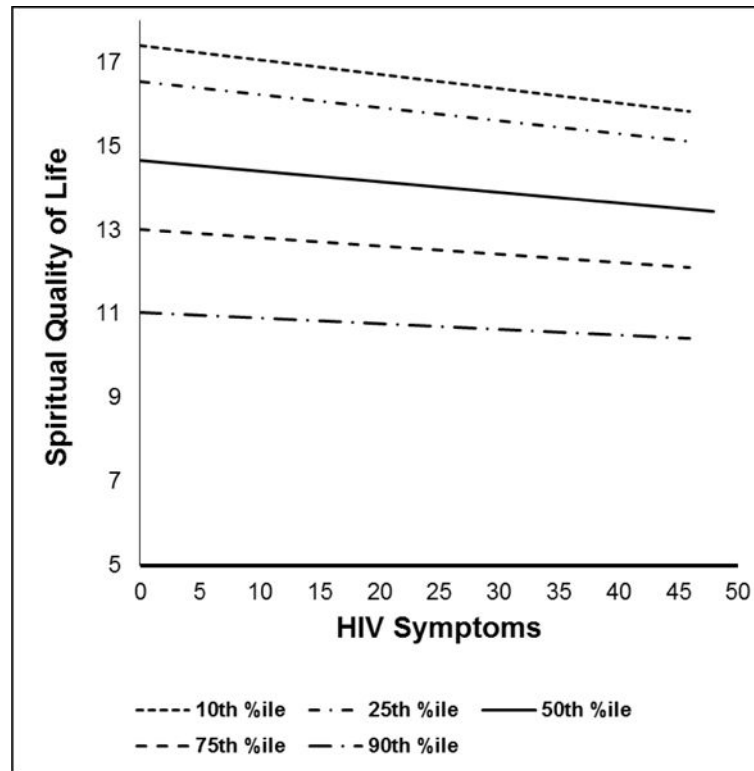


Figure 6. Main and interactive effects of HIV symptoms and emotion dysregulation on Spiritual QOL

Zero-order correlations among study variables

Table 1

	Sex	Age	Race	Sex Orient.	Edu	Time since Dx	HIV Sx	DEERS	Physical QoL	Psyc QoL	Ind QoL	Social QoL	Env QoL	Spiritual QoL
Sex ^a	–	.04	.14	.60***	.30***	.12	-.17	-.05	.06	-.03	.10	.05	.03	.00
Age ^a		–	-.03	.09	.15	.20	-.01	-.06	.05	-.04	.00	.02	.07	.08
Race ^a			–	.24*	.15	.12	.10	.04	-.17	-.14	-.11	-.05	-.10	-.07
Sexual Orientation ^a				–	.37***	.16	-.18	-.10	.07	.01	.14	-.08	.01	.04
Education ^a					–	.05	-.25*	-.14	.07	.10	.18	.10	.12	.11
Time since Diagnosis ^a						–	-.20	-.26*	.16	.06	.21	.03	.18	.20
HIV Symptoms ^b							–	.48***	-.57***	-.34**	-.56***	-.40***	-.25*	-.38**
DEERS ^c								–	-.64***	-.53***	-.54***	-.45***	-.40***	-.63***
Physical QoL ^d									–	.57***	.68***	.52***	.48***	.54***
Psychological QoL ^d										–	.66***	.65***	.64***	.66***
Independence QoL ^d											–	.56***	.61***	.55***
Social QoL ^d												–	.63***	.56***
Environmental QoL ^d													–	.37***
Spiritual QoL ^d														–
Descriptive Statistics														
Mean (n)	20	48.19	48	44	2.91	197.63	25.95	86.65	12.63	12.71	12.60	11.60	13.11	13.86
SD (%)	26.70	8.03	64.00	58.70	1.43	17.46	17.46	28.29	3.54	3.26	3.26	3.91	2.80	3.85

Note: Sex, coded female = 0 and male = 1; descriptors for % female; Age = age in years; Race = racial self-identification, with non-white = 0 and white = 1, descriptors for % white; Sexual Orientation = self-identified sexual orientation, with heterosexual = 0 and sexual minority = 1, with descriptors for % sexual minorities; Education = Highest level of education achieved; Time since Diagnosis = time in months since diagnosed with HIV; HIV Symptoms = ACTG Adherence Questionnaire-HIV Symptoms subscale total score; DEERS = Difficulties in Emotion Regulation total scale score; Physical QoL =

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Physical Quality of Life subscale score from the HIV Quality of Life Scale; Psychological QoL = Psychological Quality of Life subscale; Independence QoL = Independence Quality of Life subscale score; Social QoL = Social Quality of Life subscale score; Environmental QoL = Environmental Quality of Life subscale score; Spiritual QoL = Spiritual Quality of Life subscale score.

^a Covariates.

^b Predictor.

^c Moderator.

^d Outcome Variables.

* $p < .05$;

** $p < .01$;

*** $p < .001$

Table 2

Hierarchical regression results with each step of the model for physical quality of life.

Physical Quality of Life	Step 1				Step 2				Step 3			
	β	SE	t	p	β	SE	t	p	β	SE	t	p
Interaction	–	–	–	–	–	–	–	–	.15	0.00	1.52	.13
HIV Symptoms	–	–	–	–	–.35	0.02	–3.37	.001	–.37	0.02	–3.56	.001
DEERS	–	–	–	–	–.48	0.01	–4.83	<.001	–.51	0.01	–5.06	<.001
Age	–.01	0.05	–0.06	.95	.03	0.04	0.30	.77	–.01	0.04	–0.07	.94
Gender	.00	1.16	0.02	.98	.00	0.86	0.02	.99	–.02	0.86	–0.18	.86
Race	–.22	0.89	–1.82	.07	–.11	0.67	–1.21	.23	–.11	0.66	–1.17	.25
Sexual Orientation	.07	1.09	0.46	.65	.02	0.81	0.15	.88	.05	0.81	0.40	.69
Education	.07	0.32	0.54	.59	–.08	0.24	–0.79	.44	–.06	0.24	–0.57	.57
Time since Diagnosis	.18	0.01	1.45	.15	–.03	0.00	–0.28	.79	.01	0.00	0.12	.90
constant	–	2.64	4.27	<.001	–	1.95	6.52	<.001	–	1.93	6.61	<.001
	$R^2 = .08$; Adj. $R^2 = -.01$				$R^2 = .51$; Adj. $R^2 = .46$				$R^2 = .53$; Adj. $R^2 = .47$			
	$F(6, 68) = 0.94, p = .48$				$F(8, 66) = 8.74, p < .001$				$F(9, 65) = 8.18, p < .001$			
	–				$R^2 = .44, p < .001$				Interaction $R^2 = .02, p = .13$			

Psychological Quality of Life	Step 1				Step 2				Step 3			
	β	SE	t	p	β	SE	t	p	β	SE	t	p
Interaction	–	–	–	–	–	–	–	–	.29	0.00	2.56	.013
HIV Symptoms	–	–	–	–	–.12	0.02	–0.95	.35	–.16	0.02	–1.38	.17
DEERS	–	–	–	–	–.49	0.01	–4.09	<.001	–.53	0.01	–4.62	<.001
Age	–.08	0.05	–0.66	.51	–.06	0.04	–0.60	.55	–.13	0.04	–1.22	.23
Gender	–.08	1.09	–0.54	.59	–.07	0.94	–0.53	.60	–.11	0.91	–0.87	.39
Race	–.17	0.83	–1.36	.18	–.10	0.73	–0.91	.37	–.09	0.70	–0.85	.40
Sexual Orientation	.04	1.02	0.24	.81	.00	0.88	0.01	1.00	.06	0.86	0.43	.67
Education	.14	0.30	1.07	.29	.05	0.26	0.41	.69	.09	0.25	0.78	.44
Time since Diagnosis	.10	0.00	0.78	.44	–.06	0.00	–0.52	.60	.01	0.00	0.13	.90
constant	–	2.46	5.44	<.001	–	2.13	6.76	<.001	–	2.05	7.08	<.001
	$R^2 = .05$; Adj. $R^2 = -.04$				$R^2 = .31$; Adj. $R^2 = .23$				$R^2 = .38$; Adj. $R^2 = .29$			
	$F(6, 68) = 0.57, p = .75$				$F(8, 66) = 3.78, p = .001$				$F(9, 65) = 4.37, p < .001$			

	Step 1			Step 2			Step 3					
	β	SE	t	p	β	SE	t	p	β	SE	t	p
Psychological Quality of Life												
Interaction $R^2 = .06, p = .013$												
$R^2 = .27, p < .001$												
Independence Quality of Life												
Interaction												
HIV Symptoms	-.09	0.05	-0.74	.46	-.36	0.02	-3.18	.002	-.39	0.02	-3.50	.001
DERS	-.02	1.05	-0.12	.90	-.35	0.01	-3.19	.002	-.38	0.01	-3.52	.001
Age	-.19	0.80	-1.60	.11	-.06	0.04	-0.57	.57	-.10	0.04	-1.01	.32
Gender	.11	0.98	0.71	.48	-.03	0.86	-0.27	.83	-.05	0.85	-0.46	.65
Race	.17	0.29	1.39	.17	-.09	0.67	-0.91	.36	-.08	0.65	-0.86	.39
Sexual Orientation	.23	0.00	1.93	.06	.06	0.81	0.49	.62	.10	0.80	0.80	.43
Education	-.23	2.38	4.94	< .001	.05	0.24	0.43	.67	.07	0.24	0.70	.49
Time since Diagnosis	-.23	0.00	1.93	.06	.06	0.00	0.62	.54	.11	0.00	1.09	.28
constant	-.23	2.38	4.94	< .001	-.19	1.96	6.58	< .001	-.19	1.92	6.74	< .001
$R^2 = .11$; Adj. $R^2 = .04$												
$R^2 = .43$; Adj. $R^2 = .36$												
$F(6, 68) = 1.46, p = .20$												
$R^2 = .45$; Adj. $R^2 = .38$												
$F(9, 65) = 6.01, p < .001$												
$R^2 = .31, p < .001$												
$F(9, 65) = 6.01, p < .001$												
Interaction $R^2 = .03, p = .065$												

	Step 1			Step 2			Step 3					
	β	SE	t	p	β	SE	t	p	β	SE	t	p
Social Quality of Life												
Interaction												
HIV Symptoms	-.00	0.06	0.03	.97	-.26	0.03	-2.06	0.04	0.10	0.00	0.81	0.42
DERS	-.00	1.31	0.86	0.39	-.37	0.02	-3.08	0.00	-0.27	0.03	-2.15	0.04
Age	-.05	1.01	-0.39	.70	-.03	0.97	-0.27	.79	-.39	0.02	-3.16	0.00
Gender	-.20	1.23	-1.31	.20	0.03	0.05	0.27	0.79	0.01	0.05	0.07	0.94
Race	0.13	0.36	1.06	.29	0.03	1.14	0.98	0.33	0.12	1.16	0.87	0.39
Sexual Orientation	-0.05	1.01	-0.39	.70	0.04	0.89	0.32	0.75	0.04	0.90	0.35	0.73
Education	-0.20	1.23	-1.31	.20	-0.24	1.07	-1.80	0.08	-0.23	1.09	-1.63	0.11
Time since Diagnosis	0.14	0.36	1.06	.29	0.03	0.32	0.25	0.80	0.04	0.33	0.36	0.72
constant	0.04	0.01	0.35	.73	-0.11	0.01	-0.98	0.33	-0.09	0.01	-0.74	0.47
$R^2 = .04$; Adj. $R^2 = -.05$												
$R^2 = .30$; Adj. $R^2 = .21$												
$R^2 = .30$; Adj. $R^2 = .21$												

	Step 1			Step 2			Step 3						
	β	SE	t	p	β	SE	t	p	β	SE	t	p	
Social Quality of Life	$F(6, 68) = 0.47, p = .83$												
	$F(8, 66) = 3.41, p = .002$												
	$R^2 = .26, p < .001$												
	$F(9, 65) = 3.09, p = .004$												
	Interaction $R^2 = .01, p = .42$												
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	Step 1			Step 2			Step 3						
	β	SE	t	p	β	SE	t	p	β	SE	t	p	
Environmental Quality of Life	$R^2 = .07; \text{Adj. } R^2 = -.02$												
	$R^2 = .19; \text{Adj. } R^2 = .09$												
	$F(6, 68) = 0.81, p = .56$												
	$F(8, 66) = 1.88, p = .08$												
	$R^2 = .12, p = .011$												
	$R^2 = .27; \text{Adj. } R^2 = .17$												
	$F(9, 65) = 2.71, p = .01$												
	Interaction $R^2 = .09, p = .007$												
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	Step 1			Step 2			Step 3						
	β	SE	t	p	β	SE	t	p	β	SE	t	p	
Spiritual Quality of Life	$R^2 = .07; \text{Adj. } R^2 = -.02$												
	$R^2 = .19; \text{Adj. } R^2 = .09$												
	$F(6, 68) = 0.81, p = .56$												
	$F(8, 66) = 1.88, p = .08$												
	$R^2 = .12, p = .011$												
	$R^2 = .27; \text{Adj. } R^2 = .17$												
	$F(9, 65) = 2.71, p = .01$												
	Interaction $R^2 = .09, p = .007$												
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Interaction	-	-	-	-	-	-	-	-	-	0.04	0.00	0.37	0.71
HIV Symptoms	-	-	-	-	-0.05	0.02	-0.38	0.70	-0.11	0.02	-0.83	0.41	
DERS	-	-	-	-	-0.34	0.01	-2.61	0.01	-0.40	0.01	-3.17	0.00	
Age	0.01	0.04	0.09	0.93	0.02	0.04	0.18	0.86	-0.06	0.04	-0.50	0.62	
Gender	0.02	0.93	0.11	0.91	0.03	0.88	0.20	0.84	-0.02	0.85	-0.15	0.88	
Race	-0.14	0.71	-1.14	0.26	-0.10	0.68	-0.82	0.41	-0.09	0.65	-0.76	0.45	
Sexual Orientation	-0.05	0.87	-0.32	0.75	-0.07	0.83	-0.49	0.63	-0.01	0.80	-0.05	0.96	
Education	0.14	0.25	1.10	0.27	0.09	0.25	0.68	0.50	0.13	0.24	1.10	0.28	
Time since Diagnosis	0.19	0.00	1.58	0.12	0.09	0.00	0.76	0.45	0.18	0.00	1.49	0.14	
constant	-	2.10	5.41	<.001	-	2.00	5.97	<.001	-	1.91	6.31	<.001	

Spiritual Quality of Life	Step 1			Step 2			Step 3					
	β	SE	t	p	β	SE	t	p	β	SE	t	p
	$R^2 = .06$; Adj. $R^2 = -.02$											
	$F(6, 68) = 0.76, p = .60$											
				$R^2 = .41$; Adj. $R^2 = .34$			$R^2 = .41$; Adj. $R^2 = .33$					
				$F(8, 66) = 5.73, p < .001$			$F(9, 65) = 5.04, p < .001$					
				$R^2 = .35, p < .001$			Interaction			$R^2 = .001, p = .71$		

Note: Sex, coded female = 0 and male = 1, descriptives for % female; Education = Highest level of education achieved; Age = age in years; Race = racial self-identification, with non-white = 0 and white = 1, descriptives for % non-white; Sexual Orientation = self-identified sexual orientation, with heterosexual = 0 and sexual minority = 1, descriptives % sexual minorities; Time since Diagnosis = time in months since diagnosed with HIV; HIV Symptoms = ACTG Adherence Questionnaire-HIV Symptoms subscale total score (Justice et al., 2001); DERS = Difficulties in Emotion Regulation total scale score (Grazz & Roemer, 2004); Physical QOL = Physical Quality of Life subscale score from the HIV Quality of Life Scale (O'Connell & Skevington, 2012); Psychological QOL = Psychological Quality of Life subscale score; Independence QOL = Independence Quality of Life subscale score; Social QOL = Social Quality of Life subscale score; Environmental QOL = Environmental Quality of Life subscale score; Spiritual QOL = Spiritual Quality of Life subscale score.