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Contextualizing psychosocial determinants of alcohol use by age cohorts of adults living with HIV, ages 50 and older

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Abstract

We examined the influence of age on associations between affective states, social support, and alcohol use by age cohorts. We recruited 96 older Black adults living with HIV from the southeastern United States in 2013 and 2014. Participants completed questionnaires assessing demographics, psychological function, and substance use. Hierarchical regression analyses assessed the relationship between psychosocial factors and alcohol use in a 50- to 59-year-old group, and a 60 years and older age group. After controlling for covariates, trait anger, state anger, and life stress were positively associated with alcohol consumption in the younger group, while social support was negatively associated with alcohol consumption in the older group. Interventions should target negative affective states in 50- to 59-year-old adults with HIV, and preserve social support for adults with HIV as they age, as such interventions will likely have an impact on these individuals' alcohol consumption and longstanding quality of life.

Keywords

alcohol use; aging; HIV; mental health; quality of life; social support

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People living with HIV (PLWH) are aging; 40% of PLWH in the United States are ages 50 years or older (Centers for Disease Control & Prevention [CDC], 2014). Further, this age group has seen a significant increase in HIV incidence rates, with those ages 50 and older accounting for 21% of new cases (CDC, 2014). In a previous study, 50-59 year olds living with HIV comprised 40.1% of the 4,227 people sampled, while 29.1% of those sampled were ages 60 to 69 (Negin et al., 2012). Older PLWH have reported lower ratings of psychosocial function and physical health (Rueda, Law, & Rourke, 2014). Additionally, in the United States older PLWH misuse alcohol at higher rates than the general population, which exacerbates medical co-morbidities (Green et al., 2010). With antiretroviral medications increasing life expectancies for PLWH (Mahy, Autenrieth, Stanecki, & Wynd, 2014), continued examination of health behaviors such as alcohol use is required to promote optimal health outcomes.

Regarding psychosocial factors, older PLWH report higher levels of stress, anxiety, and depression, and have smaller social networks compared to their younger counterparts (Bhatia & Munjal, 2014; Chaudhury, 2016; Kalichman, Heckman, Kochman, Sikkema, & Bergholte, 2014; Mohammed, Mengistie, Dessie, & Godana, 2015; Rueda et al., 2014). Psychological dysfunction, including anxiety and depression, can negatively influence treatment adherence, and can increase substance use in PLWH (Schadé, van Grootheest, & Smit, 2013; Tao et al., 2016). One study also found that those with higher self-reported trait anger, or general feelings of anger, had a decreased likelihood of adhering to a consistent antiretroviral therapy (ART) regimen. Researchers concluded that self-embitterment or feelings of resentment might mediate the effects of anger on health behaviors in PLWH (Leombruni et al., 2009).

Alcohol use does not typically decline with age for PLWH (U.S. Department of Health and Human Services, 2009). Due to their disease status, older PLWH have evidenced increased medical frailty as compared to older adults not living with HIV, generally resulting in increased vulnerability to the effects of substance use compared to their same age counterparts (Vance, 2010). Substance use is associated with decreased engagement in HIV care, greater medical co-morbidities, less social support, and a poorer quality of life (High et al., 2012; Lehavot et al., 2011; Walkup et al., 2008; Weber et al., 2013).

The increasing success of ART now allows older adults with HIV to live longer and this trend will likely result in greater numbers of older people living with the diagnosis. Studies often examine older PLWH as one homogenous cohort, yet the classification of “older” may benefit from closer examination. Traditionally, older adults with HIV have been considered to be those ages 50 and older, and studies have shown that quality of life decreases with age in this population (Cahill & Valadéz, 2013; Pereira & Canavarro, 2011). Research has also suggested that there may be meaningful differences between PLWH in their 50s as compared to those in their 60s (Lima et al., 2007; Vance, Mugavero, Willig, Raper, & Saag, 2011). Vance et al. (2011) concluded that older adults living with HIV represented a heterogeneous group, with comorbidities increasing with age. Additionally, Vance et al. (2011) found that HIV-infected 50 year olds consumed significantly more alcohol than HIV-infected adults ages 60 and older, although motives for alcohol consumption were not inspected. Due to the differences in clinical characteristics, including quantity of alcohol consumption observed

between these two groups, the need to examine additional distinctions between HIV-infected 50 year olds and HIV-infected 60 year olds, as well as potential differences in the determinants of alcohol use between these groups would be meaningful (Vance et al., 2011). To address the current gap in the literature, we examined differences between participants ages 50 to 59 and those 60 and older.

Scant evidence has been provided regarding the associations between psychosocial factors and alcohol use in these further delineated groups. Thus, we aimed to examine the influence of age on associations between affective states, social support, and alcohol use by age categories. We hypothesized that problematic alcohol use would be more strongly associated with negative affective states (e.g., stress, loneliness, depression, anger) among those in the 50-to 59-year-old group, as they might have been more likely to use substances as a form of self-medication for life stressors compared to those in the older group. We hypothesized that the 60 and older age group would be more likely to engage in problem drinking because of lack of social support, as they might have experienced a greater loss of significant others and peers as they entered late adulthood.

Methods

Participants and Recruitment

Our sample was comprised of 96 Black adults living with HIV who were ages 50 and older. Participants were recruited between October 2013 and January 2014. Recruitment was conducted at the University of Florida Center for HIV/AIDS Research, Education, and Service (UF CARES) by clinic personal who approached and discussed the study with arriving patients. After receiving an initial summary of the study, interested patients were guided to a room in the clinic where they were provided with additional, detailed information about the study. Upon patient confirmation of participation, clinic staff obtained written consent. Following consent, participants were assessed for information related to demographics, psychological function, and substance use. A \$25 (USD) gift card was awarded to participants after completing the study. The University of Florida Institutional Review Board approved the study.

Measures

Measures were used to characterize psychosocial factors impacting alcohol use in this population. All questionnaires used were validated measures of psychosocial function.

Demographics—Age, race, gender, income, education, religion, marital status, and number of children were collected.

Loneliness—Substance using individuals living with HIV experience higher levels of interpersonal conflict and relational instability, which has been linked to loneliness and risky health behaviors (e.g., unprotected sex; Kott, 2011). The University of California Los Angeles Loneliness Scale (UCLA-Version I) was administered to measure feelings of loneliness. The UCLA Loneliness Scale has a test-retest reliability of $p = 0.73$ and an internal consistency of $\alpha = 0.96$. The 20-item scale is comprised of Likert items with scales

ranging from 0 (*never*) to 3 (*always*), yielding scores ranging from 0 to 60. Higher scores were indicative of increased loneliness (Russell, Peplau, & Ferguson, 1978).

Depression—Racial minorities living with HIV experience higher levels of depression, which has a high level of comorbidity with alcohol use disorder (Tegger et al., 2008). The Beck Depression Inventory-II (BDI-II) assesses symptoms of depression in the previous 14 days. The BDI has consistently shown high reliability and validity. The 21 items consist of Likert scales ranging from 0 (*not at all*) to 3 (*severe*), culminating in total scores ranging from 0 to 63, with higher scores evidencing more severe depressive symptomatology. Ranges of depression severity are indicated by the following scores: 0–9 (*minimal*), 10–16 (*mild*), 17–29 (*moderate*), and 30–63 (*severe*; Beck, Steer, & Brown, 1996).

Anger—Feelings of anger can negatively influence psychosocial function in adults with HIV (Whitehead, Hearn, & Burrell, 2014). The State-Trait Anger Expression Inventory (STAXI) uses 4-point Likert scales ranging from 0 (*never*) to 3 (*always*). We examined Trait Anger ($\alpha = 0.86$), an 8-item scale measuring frequency of angry feelings, and State Anger, an 8-item scale measuring the intensity of anger of a participant at the time of administration. Scores range from 10 to 40 and higher scores indicate increased feelings of anger ($\alpha = 0.73$; Spielberger, 1999).

Life stress—Stress and coping research has found that the majority of stress derives from daily challenges rather than major life events (Kanner, Coyne, Schaefer, & Lazarus, 1981). The Life Burdens Scale (LBS) captures daily frustrations and interpersonal, financial, and personal safety concerns. It is comprised of 42 items using 4-point Likert scales, examining a participant's total number of reported stressors in the previous 30 days. Measures include items pertaining to interpersonal difficulties and financial problems. Scores are summed yielding a range of 42 to 168, with higher scores representing increased life stress.

Social support—Evidence has suggested that the perception of available support, rather than actual support received, is related to adjustment to stressful events (Wethington & Kessler, 1986). The ENRICH Social Support Instrument (ESSI) measures the perception that others are available to provide emotional and informational support, using 5-point Likert scales; (test-retest reliability [$p = 0.98$], internal consistency [$\alpha = 0.88$]; Vaglio et al., 2004).

Alcohol consumption—Alcohol consumption was assessed via three self-report measures: (a) Frequency: *How many days per week do you drink?* (number of drinking days per week); (b) Average Quantity: *How many drinks do you have on average per occasion?* (number of drinks per occasion); and (c) Maximum Quantity: the maximum number of drinks on a given occasion in the previous month (maximum number of drinks on a single occasion), can more accurately estimate the maximum number of drinks consumed in a single episode of binge drinking, and is important given that infrequent binge drinkers may consume less alcohol per week than continuous drinkers (Maier & West, 2001; National Institute on Alcohol Abuse and Alcoholism, 2003).

Statistical Analyses

The associations of affective states and substance use as well as social support and substance use were examined using multivariate statistics (SPSS, Version 22). Univariate group differences were examined via independent samples *t*-tests and chi-square analyses. The influence of age was explored via age stratified hierarchical multiple regression analyses controlling for gender, income, and marital status.

Results

Our sample ($N = 96$), on average, was 55.77 years of age ($SD = 5.27$), including 76 participants who were ages 59 years or younger and 20 participants who were 60 years or older. The mean age for the younger group was 53.53 years ($SD = 2.73$) while the mean age for the older group was 64.05 years ($SD = 4.12$). The mean age of the two groups was significantly different ($t[94] = 13.65, p < .001$). The majority of the sample (62.9%) was female, and the majority of participants (82.1%) reported incomes less than \$25,000 (USD) per year. Fifteen participants reported non-adherence to a strict medication regimen and 32 participants had a detectable viral load (Table 1). Half of participants (51%) reported alcohol consumption in the previous 6 months, while 29.2% reported drinking alcohol in the previous 7 days. There were no significant differences between groups on measures of affect, social support, or substance use (Table 2).

Hierarchical multiple regression analyses were conducted to examine the relationships between affective states, social support, and alcohol consumption, while controlling for the covariates of gender, income, and marital status. Covariates were not significantly associated with the outcome measures within the three models in both the 50- to 59-year-old group and the 60 years and older group. Separate models were run for each age group (Table 3).

50- to 59-year-old age cohort

In the 50- to 59-year-old group, the overall model was significant, examining the relationship between psychosocial variables and number of drinking days per week ($F[1, 57] = 4.99, R^2 = .268, p = .026$). Within the model, both trait anger ($\beta = .428, R^2 = .102, p = .012$) and state anger ($\beta = .392, R^2 = .091, p = .010$) were significantly associated with number of drinking days per week. The model examining the relationships between psychosocial variables and average number of drinks per occasion was not significant ($F[1, 65] = 4.59, R^2 = .238, p = .071$). Within the model, trait anger was associated with average number of drinks per occasion ($\beta = .328, p = .039, R^2 = .06$). The model examining the relationship between psychosocial variables and maximum number of drinks per single occasion was significant in the 50-year-old group ($F[1, 65] = 18.50, R^2 = .322, p = .006$). Within the model, trait anger ($\beta = .403, R^2 = .092, p = .008$), state anger ($\beta = .387, R^2 = .088, p = .009$), and life stress ($\beta = .350, R^2 = .064, p = .041$) were associated with maximum number of drinks per single occasion. Social support was not significantly associated with any of the three self-report measures of alcohol consumption in the 50- to 59-year-old group.

60 and older age cohort

In the 60 and older cohort, social support was associated with a decrease in alcohol consumption across all three self-report measures. The model was not significant when examining the relationship between psychosocial variables and number of drinking days per week in the 60 and older age group, ($F[1, 17] = 4.50$, $R^2 = .648$, $p = .249$). However, within the model, social support was negatively associated with number of drinking days per week ($\beta = -.595$, $R^2 = .215$, $p = .039$). The model examining the relationship between psychosocial variables and average number of drinks per occasion, was significant ($F[1, 17] = 2.833$, $R^2 = .840$, $p = .016$). Within the model, social support was negatively associated with number of drinks per occasion ($\beta = -.582$, $R^2 = .208$, $p = .010$). When examining the relationship between psychosocial variables and maximum number of drinks per single occasion, the model was significant ($F[1, 17] = 5.75$, $R^2 = .803$, $p = .042$). Within the model, social support was associated with maximum number of drinks per single occasion ($\beta = -.518$, $R^2 = .164$, $p = .032$). None of the examined affective states were significantly associated with any of the three self-report measures of alcohol consumption in the 60 and older age group.

Discussion

We found notable differences in the associations between psychosocial variables and alcohol consumption in both age cohorts. Specifically, we found significant positive relationships between affective state measures such as anger and stress, and alcohol consumption in the 50-year-old group, while in the 60 and older group we found significant negative associations between social support and alcohol consumption. Our findings were consistent with previous research that has demonstrated distinct differences in the quantity of alcohol consumption by PLWH in their 50s versus their 60s (Vance et al., 2011). Although previous studies have concluded that alcohol use has important implications on morbidity and mortality in PLWH, potential age differences as determinants of alcohol consumption remain understudied in this population. Thus, our study contributes to the literature by investigating potential differences in the causes of alcohol use between younger and older cohorts of HIV-infected older adults. Based on our findings, our hypothesis that alcohol use would be more strongly associated with affective states (e.g., anger and stress) for those in the 50-to-59 year-old group, and the older group supported a significant association between social support and alcohol use.

Our finding that life stress in the younger cohort was positively associated with alcohol consumption was supported by research indicating that younger HIV-infected individuals who reported greater perceived life stress drank more frequently and were more regularly intoxicated (Scott-Sheldon et al., 2013) as well as research demonstrating a positive relationship between stress and more frequent intoxication (Pence et al., 2008). Social support may protect individuals from feeling increased levels of stress, and may also help moderate the effect of negative affective states for those who already experience stress. The decreased salience of social support in the younger cohort may speak to the significant relationships observed between stress, negative affective states, and alcohol consumption (Gibson et al., 2011).

Anger was also associated with alcohol consumption in the younger cohort of our sample. Individuals in the younger group may have been relying on alcohol use as a coping mechanism to mitigate their anger. Negative affective states may be the determinants of increased alcohol consumption observed in other studies, as well as the increased alcohol consumption observed in our 50- to 59-year-old participants. One study showed that higher self-reported trait anger and life stress showed a robust negative relationship with social support (Whitehead et al., 2014). Feelings of anger and stress may mitigate the salience of social support in the younger cohort and, thus, social support did not serve as a protective factor against alcohol consumption in this group. As the data presented were cross sectional, this finding may have also indicated that drinking increases state and trait anger. Those who report frequent drinking and higher volumes of alcohol per occasion may experience anger while intoxicated or during subsequent withdrawal (Eckhardt, 2007). Feelings of anger may be more likely to manifest in those who drink, contributing to increases in the likelihood of non-adherence to ART, such as that observed in a previous study (Leombruni et al., 2009). The literature on examinations of anger and its relationship to health behavior outcomes, such as alcohol consumption, is sparse. Our study contributes to the literature by demonstrating that anger has important associations with health behaviors in this population and, in turn, may be an important determinant of clinical outcomes. Targeting feelings of anger and stress in HIV-infected 50 year olds could improve health in this population. Decreases in anger and stress may improve individual abilities to use social support resources, which was shown to be an influential factor in reducing alcohol consumption (Whitehead et al., 2014).

Regarding the 60 and older group, research has shown that expectations regarding the mood altering effects of substance abuse decrease with age (Charles & Carstensen, 2010). We propose that the older cohort's alcohol consumption was not related to affect as they might not have perceived substance use to be an effective mood altering substance as a result of previous ineffective attempts to deal with affective distress through the use of substances. In the older group, social support was negatively associated with alcohol consumption, supporting research reporting an inverse relationship between social support and health outcomes (Vance et al., 2011). Previous findings suggest social support acts as a protective factor against stress, which is a documented correlate of substance abuse, such as heavy drinking (Galvan, Davis, Banks, & Bing, 2008). We suggest, consistent with previous research, that social support acted as a protective factor against the consumption of alcohol in the older group (Casale, Wild, Cluver, & Kuo, 2015; Nahas, Côté, Godin, Otis, & Miranda, 2015). Although the group differences in total score on the social support measure were not significant, the lower self-reported mean score in the older group may be indicative of a decrease in supportive peer relationships. Based on these findings, interventions to decrease alcohol consumption in HIV-infected adults 60 and older should work to preserve and enhance social support resources.

Limitations

Our study identifying associations between affective states and alcohol use has some limitations and several strengths. Our sample was exclusively HIV-infected Black adults ages 50 and older, making it difficult to generalize our findings to other populations that may

be of younger age, different race, or individuals not living with HIV. Second, the relatively small sample size limited our ability to assess the interaction effects of age and affective states on the different outcomes of alcohol consumption. However, the stratification of the sample allowed us to examine the influence of age on potential differences in the determinants of substance use despite the relatively small sample size. Third, the cross-sectional design inhibited our ability to determine causality. Although the frequency and quantity of alcohol consumption was relatively low, a study by Braithwaite and Bryant (2010) demonstrated that engaging in non-binge drinking levels of alcohol consumption once per week was associated with increased risk of ART nonadherence (1.5 times greater), which reduced survival in patients with HIV by more than 1 year. Participants engaging in non-binge drinking practices twice per week further decreased their median life expectancy by more than 2 years. Despite this reduction in life expectancy, researchers have also concluded that these analyses may have underestimated the impact of non-binge alcohol use on life expectancy (Braithwaite & Bryant, 2010). Thus, studying the determinants of any quantity of alcohol consumption amongst HIV-infected older adults is necessary as it will likely impact quality of life.

Conclusion

Despite the limitations of this investigation, we elucidated possible differences in the determinants of alcohol use by HIV-infected older adults. Our relatively unique age stratification helped to investigate psychosocial factors that might have been contributing to the alcohol consumption of these older adults. Our observations build on previous findings suggesting differences among age groups within older PLWH (Vance et al., 2011). Research should work to not only support these findings but also further elucidate additional psychosocial determinants of alcohol use in HIV-infected older adults. Further, more investigations into potential age differences in the determinants of illicit substance use will likely inform the treatment of older HIV-infected adults. To our knowledge, this is the first study of its kind examining the relationships between affective states, social support, and alcohol use within distinct cohorts of older adults living with HIV. Understanding these differences provides salient information for interventions attempting to improve health for older PLWH (Pereira & Canavarro, 2011). Our results suggest that interventions should target negative affective states in younger HIV-infected older adults, and preserve social support for HIV-infected adults as they age, as this will likely improve the general health of this population as well as specifically decrease deleterious alcohol consumption.

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Key Considerations

- Anger has important associations with alcohol consumption in HIV-infected 50 year olds, and mitigating these feelings may result in positive clinical outcomes.
- Decreases in anger and stress may improve abilities to use social support resources, which were shown to be an influential factor in reducing alcohol consumption.
- Social support may protect individuals from feeling increased levels of stress and may also help moderate the effect of negative affective states for those who are already experiencing stress.
- Interventions should target negative affective states in younger HIV-infected older adults, and preserve social support for HIV-infected adults as they age, as such interventions will likely have an impact on alcohol consumption and longstanding quality of life.

Table 1
Demographic, Alcohol Use, and Psychosocial Assessment Comparisons by Age Cohort (N = 96)

VARIABLE	ENTIRE SAMPLE		50-59		60+	
	M or N	SD or %	M or N	SD or %	M or N	SD or %
<i>N</i>	96		76		20	
Age	55.72	5.26	53.53	2.73	64.05	4.12
Race, African American	96	100	76	100	20	100
Gender, Men	36	37	27	28	9	45
Women	60	63	49	72	11	55
Marital Status						
Single, Never Married	49	51	42	55	7	35
Married/Common Law	10	11	7	11	3	15
Divorced/Widowed/Separated	37	38	27	37	10	50
Income						
< 10,000	47	49	37	49	10	50
10,000 – 14,999	22	23	17	22	5	25
15,000 – 19,999	12	12	11	14	1	5
20,000 – 24,999	2	2	2	2	0	0
> 25,000	3	3	3	4	0	0
HIV-Related Variables						
Years Since Diagnosis	14.83	10.63	14.23	10.41	16.55	11.51
CD4+ T Cell Count	533.15	275.76	552.08	286.74	471.27	220.80
Detectable Viral Load	32	33	27	36	5	25
Self-Reported Non-Adherence	15	16	12	16	3	15

Note. *N* may vary slightly because of missing data.

Table 2
Alcohol Use and Psychosocial Assessment Comparisons by Age Cohort (N = 96)

VARIABLE	ENTIRE SAMPLE			50-59		60+	
	M	SD	M	SD	M	SD	P-Value
Number of Drinks per Occasion	1.31	1.60	1.39	1.665	1.00	1.32	.359
Maximum Number of Drinks in the Previous Month	1.89	2.63	1.97	2.79	1.56	1.94	.555
Affect Inventories							
UCLA Loneliness Scale (Loneliness)	18.92	18.92	18.67	15.97	19.90	12.62	.751
BDI-II (Depression)	9.46	7.11	9.29	7.08	10.10	7.34	.657
STAXI (Trait Anger)	17.75	6.04	18.01	6.30	16.75	4.92	.751
STAXI (State Anger)	12.78	4.78	12.80	4.93	12.70	4.30	.933
Life Burdens (Life Stress)	57.37	12.77	57.86	13.16	55.55	11.31	.474
Social Support Inventory							
ESSI (Social Support)	23.87	5.77	23.97	5.88	23.50	5.88	.746

Table 3
Linear Regression Analysis Stratified by Age, Examining the Relationship Between Affective States and Alcohol Consumption (*N* = 96)

Depression		Loneliness		Trait Anger		State Anger		Stress		Social Support	
β	R^2	β	R^2	β	R^2	β	R^2	β	R^2	β	R^2
Number of drinking days per week											
50-59	.111	.007	.134	.007	.428*	.102	.392*	.184	.021	-.004	.000
60	.016	.000	-.595	.061	.442	.102	.179	.122	.004	-.595*	.215
Number of drinks per occasion											
50-59	.115	.022	.216	.019	.328*	.060	.105	.293	.055	.048	.001
60	-.218	.015	.354	.032	.243	.031	.073	.290	.038	-.582*	.208
Maximum number of drinks on a single occasion											
50-59	.248	.016	.178	.013	.403**	.092	.387**	.350*	.064	.017	.000
60	-.297	.027	.289	.014	.356	.066	.027	.224	.053	-.518*	.164

Note.

^aControl variables included gender, income, and marital status;

^b $p < .05^*$; $p < .01^{**}$