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Alcohol use and HIV self-management

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Increased life expectancy among people living with HIV (PLWH) that is made possible by advancements in antiretroviral therapy (ART), has presented new clinical challenges pertaining to management HIV across the lifespan (United States Department of Health and Human Services [DHHS], 2013). PLWH are highly susceptible to chronic co-morbidities (Smith et al., 2014), highlighting the need for engagement in health behaviors to prevent health complications and achieve optimal outcomes. Self-management refers to the ability of a person with a chronic disease to manage symptoms and treatments, change lifestyle behaviors, and address the consequences of their condition (Coleman & Newton, 2005). There is a crucial need to identify and potentially modify behaviors and lifestyle factors that interfere with self-management practices in PLWH. One such factor is the use and misuse of alcohol.

PLWH are nearly twice as likely to use alcohol than people who do not have HIV, and an estimated 50% of PLWH have histories of alcohol problems (DHHS, n.d.). Alcohol use has been linked to increases in risk of cardiovascular disease (Freiberg & Kraemer, 2010), increased hospitalizations and emergency room visits (Azar, Springer, Meyer, & Altice, 2010), and decreased medication adherence (Kalichman et al., 2014). Alcohol directly impacts HIV treatment through several mechanisms: a) altered liver function diminishes ART metabolism, b) immune activation results in accelerated viral replication, c) acceleration of liver disease in comorbidities such as hepatitis B and C, and d) behavioral consequences such as decreased ART adherence (Pandrea, Happel, Amedee, Bagby, & Nelson, 2010). Gender also influences the overall impact of alcohol, with women naturally absorbing more alcohol and taking longer to metabolize alcohol than men regardless of quantity (CDC, 2014). As such, women with HIV are at a particularly significant risk for alcohol-related health complications.

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Samet et al. (2007) demonstrated the link between alcohol use and accelerated decline in health among PLWH. Participants who were not on ART ($n=80/180$) and continued to drink heavily (>14 drinks/week or 4 drinks on a single occasion for men <66 years of age and >7 drinks per week or 4 drinks on a single occasion for men ≥ 66 years of age and all women) had lower CD4+ T cell counts than participants who were not on ART but abstained from drinking ($n=24/61$; $p<0.03$). Alcohol use is also directly related to higher viral loads and decreased ability to achieve and sustain viral suppression (Azar et al., 2010).

The potential for alcohol use to interfere with self-management practices indicates a need to better understand the relationship between alcohol use and HIV self-management. The relationship between alcohol consumption and HIV self-management behaviors has not been widely explored. Our purpose is to describe the relationship between alcohol consumption and self-management behaviors in a group of adults living with HIV, and to describe differences between men and women with regard to alcohol consumption and self-management behaviors.

Methods

Sample and Recruitment

We used purposive sampling to examine the relationship of alcohol use to self-management behaviors in a group of adults living with HIV. The sample included men ($n=52$), women ($n=39$), and transgendered individuals ($n=2$) ranging from 20 to 66 years of age. Participants were recruited from HIV clinics, HIV service organizations, and a northeast Ohio HIV research registry. Data collection took place from November 2011 to June 2012. Our analysis is secondary to a primary study by Webel et al. (2014) which examined differences in stress and isolation in PLWH. Participants were included in the study if they were 18 years of age or older, had a documented HIV infection, and on ART, and were excluded if they were previously diagnosed diabetic or had a pacemaker due to confounding effects on cardiac measurements in the primary study (Webel et al., 2014). All participants in the primary study were eligible and included in the present analysis.

Procedures

The study was approved by the University Hospitals (Cleveland, OH) institutional review board (IRB). All participants provided written informed consent, signed a consent form allowing us to access their medical records, and completed the questionnaires either online via RedCAP or were read the questionnaires by a research assistant if they were unable to complete them on the computer. Participants received a \$50.00 cash gift card as compensation for their participation (Webel et al., 2014).

Measures

Demographic Data—Demographic data were self-reported and medical data (year of HIV diagnosis and CD4+ T cell count) were abstracted via chart extraction.

Alcohol Use—Data on alcohol use was collected using the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, De la Fuente, & Grant, 1993). The

AUDIT is a questionnaire that measures alcohol use in the past 12 months, with 10 items asking about alcohol related behaviors. Items are scored between 0 (*never*) and 4 (*daily or almost daily*), and are then summed with a total possible score of 40 and scores ≥ 8 indicating the presence of an alcohol disorder. The reliability of the AUDIT has been verified in external investigations using test-retest reliability measures (0.95 across 30 days; de Meneses-Gaya, Zuardi, Loureiro, & Crippa, 2009).

HIV Self-Management—The HIV Self-Management Scale (Webel et al., 2012) is a 20-item scale that measure that measures three specific domains that correspond to the process factors of the Individual and Family Self-Management Theory: 1) Daily Self-Management Health Practices (DSM), 2) Social Support and HIV Self-Management (SS), and 3) Chronic Nature of HIV Self-Management (CN). Items are scored on three levels: *All of the time*, *Some of the time*, *None of the time*, as well as a *Not Applicable* option. Development and psychometric evaluation of the scale by Webel et al. (2012) demonstrated the scale to be a reliable ($\alpha = 0.72-0.86$) and stable ($\alpha = 0.61-0.85$) measure of HIV self-management.

Data Analysis

Data were cleaned, scales were scored according to their established scoring procedures, and total scores were checked to ensure they met statistical assumptions. Descriptive statistics, including means, frequency counts, standard deviations, and interquartile ranges were calculated. The relationships among alcohol use, self-management and gender were assessed with Pearson correlation coefficients. All analyses were done using STATA v. 11.0.

Results

Descriptive statistics for the sample are presented in Table 1. We hypothesized that as drinking behaviors increased, self-management behaviors would decrease. Alcohol use varied across the sample, with AUDIT scores ranging from 0, (low risk of hazardous drinking behavior) to 22 (high risk of alcohol dependence; $M = 2.94$, $SD = 4.16$). Results for the effect of alcohol use on HIV self-management are presented in Table 2. The analysis indicated no relationships between alcohol and self-management among men in the study (DSM: $r = 0.028$, $p = 0.8439$; SS: $r = 0.119$, $p = 0.403$; CN: $r = -0.089$, $p = 0.530$), and no relationships between alcohol and self-management behavior in two of the three domains of HIV self-management among the women (SS: $r = 0.013$, $p = 0.939$; CN: $r = -0.008$, $p = 0.964$). However, there a correlation between alcohol use and daily HIV self-management practices by the women (DSM: $r = -0.30$, $p = 0.064$). As alcohol use increased, daily self-management practices (e.g. physical activity, diet, side effect management) decreased. It was also noted that men in the study reported higher levels of social support than the women, although the results was not statistically significant.

Discussion

Data from a primary study (Webel et al., 2015; Webel et al., 2014) were analyzed to examine the correlation between alcohol use and self-management in a sample of PLWH. There was no relationship between alcohol use and self-management among the men in the sample, or

in two of the three self-management domains among women. A possible explanation for these results is low baseline drinking behavior (AUDIT Scale $M=2.94$, $SD=4.16$), suggesting a possible floor effect that would obscure the effect of alcohol on HIV self-management. Consistent with recent literature, an inverse relationship between alcohol use and daily self-management behaviors among the women suggested that as drinking behavior increased, daily HIV self-management behaviors decreased. Hazardous or disordered drinking behaviors have been linked to diminished self-management activities (e.g. medication adherence) and accelerated decline in health among PLWH (Kalichman et al., 2014; Samet et al., 2007).

Limitations of this study include that data were collected as part of a single-site cross-sectional study, and there may be geographic variations in alcohol use and self-management practices (e.g. rural vs. urban communities). Low levels of drinking behavior by many participants limited the ability for researchers to draw conclusions across the entire sample. Finally, the generalizability of the findings is limited by the predominantly African American sample due to low representation of individuals of other racial and ethnic backgrounds.

Health authorities have called for more research on alcohol use among PLWH (National Institute on Alcohol Abuse and Alcoholism, 2014). Future studies should include diverse samples of individuals across the spectrum of alcohol use to determine the true effect of alcohol on self-management in PLWH. Longitudinal designs will help researchers understand the progression of alcohol-related health problems in PLWH and to evaluate the long-term impact of interventions designed to help decrease or eliminate drinking behavior. Researchers should use quantitative measurements of HIV self-management to determine whether specific domains of self-management are more affected by alcohol use than others. Researchers should examine impact of social support on both drinking behavior and self-management in men and women with HIV, and explore the relationship between these variables. Finally, future research should examine specific differences in effect of alcohol use based on gender, age, and race/ethnic background. This investigation also highlights the importance of implementing brief alcohol consumption measures in the clinical environment to assess for problem drinking and risk for poor self-management related to alcohol use in PLWH.

Previous research on the relationship between alcohol and HIV self-management has primarily been investigated using measures of specific HIV self-management behaviors (e.g. medication adherence; Kalichman et al., 2014). Gaining a better understanding of factors that influence HIV self-management practices will allow clinicians and researchers to develop interventions that will promote wellness and prevent health complications. Such efforts will result in higher quality of life and promote healthy aging in PLWH. Our analysis is novel because it is, to the best of our knowledge, the first attempt to examine the relationship between alcohol use and HIV self-management using a quantitative and comprehensive measure of HIV self-management.

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Table 1
Characteristics of the Study Sample: All variables are reported as *M(SD)* unless otherwise noted

	Men <i>n</i>=52M (55.91%)	Women <i>n</i>=39 (41.94%)	Transgendered <i>n</i>=2 (2.15%)	Total <i>n</i>=93 (100%)
Age (Years) Range= 20-66	48.79 (9.20)	48.36 (9.79)	50 (9.90)	48.63 (9.36)
Race:				
African American	44 (84.62%)	36 (92.31%)	1 (50%)	81 (87.10%)
Caucasian	8 (15.38%)	2 (5.13%)	1 (50%)	11 (11.83%)
Other		1 (2.56%)		1 (1.08%)
Marital Status				
Married	1 (1.92%)	3 (7.69%)		4 (4.30%)
Single	42 (80.77%)	22 (56.41%)	2 (100%)	66 (70.97%)
Separated	2 (3.85%)	8 (20.51%)		2 (2.15%)
Divorced	3 (5.77%)	3 (7.69%)		11 (11.83%)
Domestic Partner	4 (7.69%)	3 (7.69%)		7 (7.53%)
Other				3 (3.23%)
Paid Employment				
Yes	7 (13.46%)	6 (15.38%)	2 (100%)	13 (13.98%)
No	45 (86.54%)	33 (84.62%)		80 (86.02%)
Permanent Housing				
Yes	43 (82.69%)	37 (94.87%)	2 (100%)	82 (88.17%)
No	9 (17.31%)	2 (5.13%)		11 (11.83%)
CD4+ T Cell Count and Viral Load				
Recent CD4 + T Cell Count (cells/mm ³)	525.96 (281.11)	639.47 (346.03)	1108.00 (1125.71)	588.46 (344.09)
Recent Viral Load (copies per mL)	1159.17 (6148.34)	8295.22 (37636.38)	73.50 (75.66)	4204.08 (25163.45)
AUDIT				
Total AUDIT Score	3.56 (4.412)Range: 0-	2.15 (3.80)	2 (2.83)	2.94 (4.16)
Self Management				
Daily Health	2.23 (0.41)	2.19 (0.43)	2.67 (0.47)	2.22 (0.42)
Social Support	1.94 (0.99)	1.99 (0.93)	2.83 (0.24)	1.98 (0.96)
Chronic Nature of HIV	2.70 (0.42)	2.85 (0.28)	2.9 (0.14)	2.77 (0.34)

Table 2**Correlation between alcohol consumption and self-management**

WOMEN (n=52)					
	AUDIT Total	SM Daily Health	SM Social Support	SM Chronic Nature	AUDIT Total
AUDIT Total Score	1.00				1.00
SM: Daily Health	-0.299*	1.00			1.00
SM: Social Support	0.013	0.371	1.00		0.273
SM: Chronic Nature	-0.008	0.204	0.202	1.00	0.481
					0.204
					1.00

MEN (n=39)					
	AUDIT Total	SM Daily Health	SM Social Support	SM Chronic Nature	AUDIT Total
AUDIT Total Score	1.00				1.00
SM: Daily Health	-0.028	1.00			1.00
SM: Social Support	0.119	0.273	1.00		0.273
SM: Chronic Nature	-0.089	0.481	0.204	1.00	0.481
					0.204
					1.00

* Statistically significant at the level of $p < 0.10$

SM = Self-Management