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The role of personal and household members' substance use in health-related quality of life in women living with HIV/AIDS

Cui Yang¹, Peter DeBartolo², Mary E. McCaul³, Heidi E. Hutton⁴, Hirut Gebrekristos⁵, and Geetanjali Chander⁶

¹Department of Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD 21205

²Scottsdale Emergency Associates LTD, Scottsdale, AZ

³Department of Psychiatry & Behavioral Sciences, Johns Hopkins University School of Medicine, Baltimore, MD 21205

⁴Department of Psychiatry & Behavioral Sciences, Johns Hopkins University School of Medicine, Baltimore, MD 21205

⁵Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD 21205

⁶Department of Medicine, Johns Hopkins University School of Medicine, Baltimore, MD 21205

Abstract

Advances in HIV treatments have led to a greater focus on health-related quality of life (HRQOL) among people living with HIV/AIDS. The current study examined HRQOL among women living with HIV/AIDS, with a special emphasis on the roles of personal and household members' alcohol and drug use. Women in HIV care (N=378) completed a comprehensive assessment. HRQOL was measured using a modified version of the 12-Item Short Form Health Survey (SF-12); scores were derived for the mental and physical composite summaries (MCS and PCS, respectively; lower scores reflect poorer HRQOL). The Alcohol Use Disorders Identification Test (AUDIT), the Risk Assessment Battery and the 90-day Timeline Followback (TLFB) were used to measure recent alcohol and drug use. Household members' substance use were assessed by asking participants about the alcohol/drug status of persons with whom they live. Multivariate generalized linear models were used to estimate the linear association between MCS and PCS scores and demographic characteristics, and personal and household members' alcohol and drug use. We found lower MCS scores were significantly associated with personal alcohol use, lower income, not being African American, and living with someone with alcohol or/and drug problems. Lower PCS scores were significantly associated with older age and being divorced, separated or widowed. Compared to never married, being married was associated with higher PCS scores. Findings indicate that personal alcohol use and household members' substance use are independently associated with lower mental HRQOL. Universal screening and targeted

* Corresponding author: Geetanjali Chander, M.D., MPH, 600 N. Wolfe Street, Baltimore, MD 21287, Phone: 410-614-2026, gchande1@jhmi.edu.

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interventions for alcohol use by the patient or household members may offer potential strategies for improving mental health quality of life among women living with HIV/AIDS.

Keywords

HIV; alcohol; household members; women; quality of life

Introduction

Advances in HIV treatments and the resulting increase in life expectancy have led to a greater focus on optimizing the quality of life for persons living with HIV/AIDS (PLWH). Much research has examined determinants of health-related quality of life (HRQOL) in HIV, including demographics, health-promoting behaviors, comorbidities, social support, HIV-related stigma, racial discrimination. These data demonstrate that gender is an important factor in HRQOL, as women living with HIV/AIDS experience a significantly lower health-related quality of life than men (Cederfjäll, Langius-Eklöf, Lidman, & Wredling, 2001; K. McDonnell, Gielen, Wu, O'campo, & Faden, 2000; Mrus, Williams, Tsevat, Cohn, & Wu, 2005; Tesfay, Gebremariam, Gerbaba, & Abrha, 2015).

HRQOL is typically measured by using physical and mental composite summary scores. Physical HRQOL measures physical functioning, role functioning (e.g., one's ability to perform certain roles at work), general health perceptions, pain, and energy levels; while mental HRQOL assesses mood or affect (e.g., anxiety, and depression) and social functioning. Substance use has been explored as one of the key factors associated with HRQOL. Several studies have found an association between illicit drug use and lower levels of mental HRQOL (Korthuis et al., 2008; K. McDonnell et al., 2000; Sherbourne et al., 2000). However, despite the prevalence of alcohol misuse among PLWH, scant research has specifically examined alcohol use and HRQOL in PLWH (Andrinopoulos et al., 2011; Degroote, Vogelaers, & Vandijck, 2014; Korthuis et al., 2008; Rosenbloom et al., 2007; Uphold, Holmes, Reid, Findley, & Parada, 2007). Several studies have shown that hazardous levels of alcohol use decrease HRQOL in the general population, especially in the areas of mental health and social functioning (Daeppen, Krieg, Burnand, & Yersin, 1998; Donovan, Mattson, Cisler, Longabaugh, & Zweben, 2005; Kalman et al., 2004; Okoro et al., 2004; Volk, Cantor, Steinbauer, & Cass, 1997). Of the studies that have investigated this relationship between alcohol use and HRQOL in PLWH, the results have been mixed. Among a sample of 951 PLWH, Korthuis et al found no association between hazardous drinking and HRQOL (Korthuis et al., 2008), while Rosenbloom and colleagues found that the co-occurrence of alcohol abuse or dependence among PLWH was associated with lower HRQOL independent of HIV disease severity (Rosenbloom et al., 2007). Among a sample of men living with HIV, Uphold and colleagues found hazardous alcohol use to be negatively associated with social functioning, i.e., participation in social activities (Uphold et al., 2007).

Beyond demographic characteristics and personal alcohol/drug use, one's living arrangements can have a profound effect on quality of life (Joutsenniemi et al., 2006). Current research on the effects of living arrangements on health-related outcomes in PLWH

has not paid adequate attention to living environment. Who one lives with can influence patterns of every day social interactions. Positive interactions with household members can prevent social isolation and provide meaningful engagement and emotional support, resulting in higher physical and mental HRQOL among PLWH (Bateganya, Amanyiwe, Roxo, & Dong, 2015; Jia et al., 2004; Ruiz Perez et al., 2005). However, household social interactions can also entail adverse consequences, such as relational conflict (Henning-Smith, 2016). Living with someone with a substance use problem may be more likely to create interpersonal conflict, impeding availability of financial and social support to PLWH.

To date, there have been relatively few investigations into the determinants of HRQOL in women living with HIV/AIDS. Many of the cohorts studied, including those typically used to analyze the impact of hazardous alcohol and illegal drug use on HRQOL among PLWH, have been predominantly male. Other gender-specific studies have examined psychosocial and biological determinants of HRQOL but have not included alcohol use or living arrangements (Andrinopoulos et al., 2011). As a result, there is little understanding of how personal substance use and social environment of living arrangement may affect the quality of life of women living with HIV/AIDS.

In this study, we sought to assess the role of both personal alcohol and drug use, and living arrangements, with a focus on living with someone with alcohol or drug problems, on HRQOL among women living with HIV/AIDS. We hypothesized that personal and household members' alcohol and drug use would be independently associated with a significantly poorer HRQOL among women living with HIV/AIDS.

Materials and Methods

Study Design and Participants

We used baseline data from a randomized clinical trial (RCT) of brief alcohol intervention among hazardous drinking HIV infected women (n=148) (Chander, Hutton, Lau, Xu, & McCaul, 2015) and a cohort of predominantly non-hazardous drinking women (n=240) recruited concurrently with RCT participants from the same urban HIV outpatient clinic. Women were recruited between March 2006 and September 2010 through clinic flyers, waiting room recruitment, and provider referral (Barai et al., 2016; Chander et al., 2015). To be eligible for the RCT, women had to be HIV infected and receiving care in the HIV Clinic, report at-risk drinking behavior (defined as >7 standard drinks per week or two or more heavy drinking episodes) in the past 6 months or have a TWEAK score ≥ 2 (Tolerance, Worried, Eye-opener, Amnesia, K/Cut Down is a five-item scale developed originally to screen for risk drinking during pregnancy) (Russell, 1994). To be eligible for the non-hazardous drinking comparison group, women were required to meet the same criteria as women in the RCT except that they did not meet criteria for hazardous alcohol use. All women enrolled in the study underwent a baseline assessment using measures delivered by audio computer assisted self-interview (ACASI) and 90-day Timeline Followback (TLFB) (Sobell, L.C. & Sobell, M.B., 1995) interview by research staff. Of 388 women enrolled, 378 had complete data and comprise our study sample. This study was reviewed and approved by the Institutional Review Board.

Assessment

Outcome—Quality of life was ascertained using a modified version of 12-Item Short Form Health Survey (SF-12), a quality of life instrument consisting of twelve items querying eight health domains: physical functioning, physical role functioning, bodily pain, general health, vitality, social functioning, emotional role functioning, and mental health (Andrews, 2002). Using a scoring algorithm based on United States (US) 1990 norms, the SF-12 is scored into the mental composite summary (MCS) and physical composite summary (PCS) for analyses. MCS and PCS scores are continuous measures; higher values indicate greater quality of life, well-being, and functionality within mental and physical dimensions of life, respectively (Ware, Kosinski, & Keller, 1995).

Exposure—Personal alcohol use was assessed using the Alcohol Use Disorders Identification Test-C (AUDIT-C) which was completed using the ACASI. The AUDIT-C is a screening instrument for hazardous alcohol use. Consisting of the first three questions of the Alcohol Use Identification Test (AUDIT) (Bradley et al., 2007), this 3-item instrument has been validated in men, women, and multiple racial and ethnic groups (Frank et al., 2008). We used a cut-off score of 3 for detecting hazardous or harmful drinking among women (Reinert & Allen, 2007). Drug use was ascertained using TLFB and Risk Assessment Battery (RAB) (Navaline et al., 1994). RAB is a self-administered questionnaire developed to assess drug use associated with HIV transmission risk behaviors. In this study, illicit drug use was categorized as yes/no based on the use of any heroin, cocaine, benzodiazepines, cannabis or marijuana in the past month.

Household members' substance use was assessed using questions from the Family/Social Status section of the Addiction Severity Index (McLellan et al., 1992): "Do you live with anyone who has a current alcohol problem? Uses non-prescribed drugs?" with "Yes" or "No" response options. Based on participants' answers on these questions, a binary variable of household members' substance use was created: 1-living with anyone who has an alcohol problem or/and uses drugs; 0-not living with anyone who has an alcohol problem or uses drugs.

Covariates—Selection of covariates or potential confounders was based on the literature. Sociodemographic characteristics collected at baseline via ACASI included age, race, education, marital status, and annual income. Clinical covariate included in this study was CD4 cell count, which was examined as a continuous variable.

Statistical analyses

Multivariate generalized linear models (McCullagh & Nelder, 1989) were used to estimate the linear associations between personal alcohol or drug use, living arrangement variables and MCS and PCS scores. All the exposure measures described above were explored in separate models along with key covariates, including age, race, income, marital status, and CD4 cell count. We also explored the relationship of household members with an alcohol use or drug problem and quality of life variables. Statistical analyses was conducted using SAS software (Neblett, Davey-Rothwell, Chander, & Latkin, 2011) and Stata version 12 (StataCorp, 2011).

Results

Cohort

Characteristics of the full study sample, comprising both the hazardous drinkers and the comparison group (n=378), are provided in Table 1. The median age of women was 46 years; 86% of participants were African American and 12% were white. Women enrolled in the study were predominantly never married (49%); 45% had not graduated from high school, and the reported median annual income was \$7896. The median CD4 count was 431. The median score of AUDIT-C was 2, 39% of women had an AUDIT-C score ≥ 3 , and 73% reported drug use.

Bivariate and multivariate analyses of factors associated with Quality of Life

Physical health related quality of life—The median physical composite summary score was 41.2 (IQR: 33.7, 49.4). In bivariate analyses (Table 2), older age and being either widowed or divorced compared to never married were associated with a lower physical composite summary score. In multivariate analyses (Table 2), older age and being divorced, separated or widowed compared to never married were significantly associated with a lower physical composite summary score, while being married compared to never married was associated with higher physical composite summary score. Individual and household members' alcohol or illicit drug use were not independently associated with physical composite summary score.

Mental health related quality of life—The median mental composite summary score was 49.5 (IQR: 38.7, 58.0). In bivariate analyses (Table 2), African American compared to Caucasian race and higher income were associated with higher mental composite summary scores. Higher AUDIT-C score was significantly associated with lower mental composite summary score in both bivariate and multivariate analyses. Drug use was only associated with lower mental composite summary score in bivariate analysis. Compared to those not living with someone with alcohol problem or use drugs, women living with someone with alcohol or/and drug problem had significantly lower mental composite summary score in both bivariate and multivariate analyses.

Discussion

In this study of women living with HIV, we found that personal alcohol misuse and misuse of alcohol or other drugs among those in their household, were associated with poorer mental health-related quality of life. These results suggest that interventions identifying and addressing alcohol use among women living with HIV and among those in their household can potentially improve mental health-related quality of life.

While multiple studies conducted among PLWH samples have demonstrated illicit drug use as a significant detrimental determinant of mental HRQOL (Korthuis et al., 2008; K. A. McDonnell, Gielen, O'Campo, & Burke, 2005; Sherbourne et al., 2000), we did not find individual illicit drug use was independently associated with mental HRQOL in this sample of HIV-infected women. Future research should explore possible gender differences in the association between illicit drug use and mental health HRQOL.

Knowledge about effects of hazardous drinking on mental HRQOL is much more limited, particularly among HIV-infected women. Two studies reported no significant decrease in mental HRQOL associated with hazardous alcohol use among both men and women living with HIV (Korthuis et al., 2008; Sherbourne et al., 2000), although one study found a negative association with social functioning among men living with HIV (Uphold et al., 2007). Our study has much greater power to detect a significant role of alcohol misuse on mental health, given that nearly half of our participants met criteria for hazardous drinking. The failure to detect an association between hazardous drinking and mental health related-quality of life in previous studies of PLWH may be attributable to the high proportion of men in these studies. Research has suggested a weaker association between hazardous drinking and mental health related-quality of life among men as compared with women (Frezza et al., 1990).

We found no significant effects of alcohol or drug use on physical composite scores in this sample of women living with HIV/AIDS. Recent studies have also failed to demonstrate any significant association between hazardous drinking and physical health related quality of life (Korthuis et al., 2008; Sherbourne et al., 2000; Volk et al., 1997). Similarly, despite multiple studies showing a strong association between illegal drug use and decreased mental HRQOL, there has been no association found between drug use and physical HRQOL (Korthuis et al., 2008; K. A. McDonnell et al., 2005). Our study extends these findings to a female study sample. The lack of association between alcohol or drug use and physical health in HIV appears to be consistent across genders.

In addition to personal alcohol use, we found living with someone with an alcohol or drug use problem was negatively associated with mental HRQOL, but not physical HRQOL. In this study, the majority of women living with someone with an alcohol or drug use problem (79%) reported living with sex partner, children, parents or family, of which over half lived with sex partner and children or sex partner alone (data not shown). About 7.7 million US adults are currently married to or living with a partner with an alcohol use disorder (AUD) (National Institute on Alcohol Abuse and Alcoholism, 2006). Considerable psychological distress has been frequently seen among individuals with AUD partners (Rychtarik & McGillicuddy, 1997), and women with active AUD partners have been found to experience higher levels of depression, trauma, and stress-related disorders (Svenson, Forster, Woodhead, & Platt, 1995). Household interactions are often structured by household-based social roles (Hughes & Waite, 2002), and women often play caregiving roles. Our findings may be explained by the stressful expectations and obligations associated with caregiving roles to other household members with alcohol or drug use problems. Such roles may be particularly detrimental to mental HRQOL among HIV-infected women, who also have competing priorities to manage their own illness. In addition, alcohol and illicit drug use are well-documented to increase the risk of family violence, including intimate partner violence (IPV) (Abramsky et al., 2011; Choenni, Hammink, & van de Mheen, 2015; Moore, Easton, & McMahon, 2011), which may also contribute to poor mental HRQOL.

We found currently being married was associated with better physical HRQOL whereas being divorced or widowed was associated with poor physical HRQOL, reflecting a positive contribution of a stable relationship in physical health as observed in existing

literature (Preau, Protopopescu et al., 2007; Preau, Marcellin et al., 2007). The finding of the significant association of older age with lower physical composite summary scores but not with lower mental composite summary scores is also in line with earlier reports that older age was generally associated with lower physical health and mental health is less age-dependent (Degroote et al., 2014). Finally, although there is support in the literature for an association between immunological status and HRQOL (Degroote et al., 2014), we did not find CD4 cell count was associated with HRQOL in the present study. This could have been due to less variability in CD4 cell count among women who were currently in HIV care.

This study highlights the independent effects of personal alcohol use and household member's substance use on mental health related quality of life among women living with HIV. Alcohol use and misuse in particular is often under-diagnosed in clinical settings (Fiellin, Reid, & O'Connor, 2000). Consequently, HIV care providers may be missing an important barrier to quality of life among women living with HIV. Results from a recent clinical trial suggest that on-site brief alcohol intervention may provide an effective and easily implemented treatment option for women living with HIV/AIDS (Chander et al., 2015). Our findings on mental HRQOL provide further rationale for the implementation of universal screening and alcohol and drug interventions in the HIV clinic setting. Combination of HIV care and substance use treatment can improve the quality of life of PLWH, a group that consistently reports lower HRQOL than those suffering from other chronic illnesses (Korthuis et al., 2008).

Furthermore, promoting quality of life in the context of interactive household patterns may have significant implications for women living with HIV. Extending resources such as substance use screening and treatment programs to not only women living with HIV/AIDS but also to their household members who are in need of help may improve HRQOL. Furthermore, identifying substance use among household members and partners is important--individuals with a partner with an AUD often experience psychological distress, such as depression (Rychtarik & McGillicuddy, 1997). Programs providing personal cognitive coping resources and addressing interpersonal conflicts are needed. For example, a recent study of an internet-administered coping skills training program demonstrated improved coping skills and reduced symptoms of depression and anger among women living with an alcoholic partner (Rychtarik, McGillicuddy, & Barrick, 2015).

Several limitations in this study should be noted. The cross-sectional design of the study does not allow conclusions to be made regarding causality. While we chose covariates and potential confounders based on a comprehensive review of the literature, there may have been other important confounding variables that were not included in our analyses. Self-report on substance use is subject to social desirability bias. Our results may not be generalizable to women living with HIV who are not in care.

Conclusions

This study demonstrates that personal alcohol use and household members' substance use are independently associated with lower mental HRQOL in a sample of women living with HIV/AIDS. These results highlight the importance of universal, standardized screening for

alcohol and other drug use among women living with HIV/AIDS and their household members. Such screening can lead the way to improved implementation of alcohol and drug interventions and offers a potential strategy for improving mental health quality of life among women living with HIV/AIDS.

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Table 1

Sociodemographic and clinical characteristics of study sample (N=378)

Variable	N (378)	
Age (median, IQR)	46	41, 52
Race/Ethnicity		
White	45	12%
African-American	325	86 %
Hispanic and others	8	2%
Marital Status		
Never Married	186	49%
Married/common law	55	14%
Divorced/separated	93	25%
Widowed	44	12%
Income (\$) (median, IQR)	7896	5400, 9180
Education		
Less than High School graduate	172	45%
Greater than or equal to HS graduate	206	55%
CD4 count (median, IQR)	431	260,616
Drug and Alcohol Use		
Total AUDIT-C score (median, IQR)	2	0, 8
Hazardous or harmful drinking (AUDIT C 3)	147	39%
Any illicit drug use	270	73%
Living condition		
Live with someone who has alcohol or/and drug problem	85	22%
Not living with someone with alcohol or drug problem	293	78%

Table 2

Bivariate and multivariate analysis of factors associated with physical or mental health related quality of life.

	Physical health related quality of life		Mental health related quality of life	
	Bivariate	Multivariate	Bivariate	Multivariate
Age	-0.25 (-0.38, -0.12) ***	-0.22 (-0.36, -0.08) **	0.17 (0.03, 0.32) *	0.08(-0.07, 0.23)
Race				
African American	-0.36 (-3.33, 2.61)	-0.28 (-3.26, 2.70)	4.69 (1.30, 8.06) **	3.92(0.55,7.28) *
Caucasian/Other	Reference	Reference	Reference	Reference
Income				
\$7,884	0.03 (-2.03, 2.10)	0.78 (-1.31, 2.87)	2.41 (0.06, 4.76) *	2.40(0.03,4.76) *
<\$7,884	Reference	Reference	Reference	Reference
Marital Status				
Married/common law	2.68 (-0.32, 5.69) ⁺	3.21(0.14,6.29) *	1.11 (-2.42, 4.64)	0.37(-3.10,3.84)
Divorced/separated	-2.96 (-5.45, -0.47) *	-2.22(-4.82,0.37) ⁺	0.07 (-2.85, 2.99)	-0.58(-3.52,2.36)
Widowed	-5.12 (-8.41, -1.84) **	-3.85(-7.33, -0.38) *	1.15 (-2.71, 5.05)	0.23(-3.70, 4.15)
Never married	Reference	Reference	Reference	Reference
CD4 Cell Count	0.002 (-0.001, 0.006)	0.002(-0.001,0.006)	0.002 (-0.002, 0.05)	-0.001(-0.005,0.003)
AUDIT-C score	-0.12 (-0.26, 0.10)	-0.11(-0.25,0.30)	-0.35 (-0.50, -0.20) ***	-0.28(-0.43, -0.12) ***
Any illicit drug use	-1.53(-3.88, 0.82)	-0.98(-3.37,1.41)	-4.04(-6.68, -1.40) **	-1.92(-4.62, 0.78)
Living arrangement				
Live with someone with alcohol or/and drug problem	-1.70(-4.17,0.77)	-1.10(-3.61,1.41)	-4.77(-7.55, -1.98) **	-2.88(-5.72, -0.04) *
Not live with someone with alcohol or/and drug problem	Reference	Reference	Reference	Reference

⁺ p<.10,

* p<.05,

** p<.01,

100>d

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