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Reasons for limiting drinking in an HIV primary care sample

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Abstract

BACKGROUND—Heavy drinking among individuals with HIV is associated with major health concerns (liver disease, medication nonadherence, immune functioning), but little is known about cognitive-motivational factors involved in alcohol consumption in this population, particularly reasons for limiting drinking.

METHODS—Urban HIV primary care patients (N=254; 78.0% male; 94.5% African American or Hispanic) in a randomized trial of brief drinking-reduction interventions reported on reasons for limiting drinking, alcohol consumption, and alcohol dependence symptoms prior to intervention.

RESULTS—Exploratory factor analysis indicated three main domains of reasons for limiting drinking: social reasons (e.g., responsibility to family), lifestyle reasons (e.g., religious/moral reasons), and impairment concerns (e.g., hangovers). These factors evidenced good internal consistency (α s=0.76–0.86). Higher scores on social reasons for limiting drinking were associated with lower typical quantity, maximum quantity, and binge frequency (p s<0.01), and higher scores on lifestyle reasons were associated with lower maximum quantity, binge frequency, and intoxication frequency (p s<0.01). In contrast, higher scores on impairment concerns were associated with more frequent drinking and intoxication, and higher risk of alcohol dependence (p s<0.05), likely because dependent drinkers are more familiar with alcohol-induced impairment.

CONCLUSIONS—The current study is the first to explore reasons for limiting drinking among individuals with HIV, and how these reasons relate to alcohol involvement. This study yields a scale that can be used to assess reasons for limiting drinking among HIV-positive drinkers, and provides information that can be used to enhance interventions with this population. Discussing social and lifestyle reasons for limiting drinking among less extreme drinkers may support and validate these patients' efforts to limit engagement in heavy drinking; discussion of impairment reasons for limiting drinking may be a way to engage dependent drinkers in efforts to decrease their alcohol consumption.

Keywords

HIV; alcohol; social; drinking motives; reasons for drinking less

Introduction

Over a million people in the US are living with HIV (Centers for Disease Control and Prevention, 2012). Prior to the introduction of antiretroviral therapy (ART), HIV was an acute, fatal disease. ART medication has changed this, greatly increasing the lifespan of HIV-infected individuals (Centers for Disease Control and Prevention, 2011, Deeks and Phillips, 2009). However, HIV-positive individuals with high drinking levels (especially those with alcohol use disorders) do not fully benefit from the medical advances in HIV treatment for several reasons. Alcohol use and ART medications both contribute to liver disease, which is especially dangerous for the large proportion of HIV-positive patients who are co-infected with hepatitis (Barve et al., 2010). HIV patients with heavy drinking (including those with alcohol use disorders) also have lower ART adherence than their lighter-drinking peers (Azar et al., 2010). In fact, to protect their livers, some HIV patients intentionally skip ART medication when drinking, rather than limit their drinking (Kenya et al., 2013, Kalichman et al., 2013, Kalichman et al., 2009, Kalichman et al., 2012). Further, drinking may impair immune functioning in individuals with HIV (Shuper et al., 2010), with some recent studies showing lower CD4 count and higher viral load in heavy or problematic drinkers (Hahn and Samet, 2010). For these reasons, maintaining low levels of drinking is important for individuals with HIV.

Understanding cognitive-motivational factors related to drinking in HIV patients could help providers understand patients' drinking better, and thus intervene more effectively. Studies thus far have focused on reasons *for* drinking. These studies indicate that drinking is related to coping and social drinking motives (Elliott et al., in press) and expectancies about alcohol and sex (Bimbi et al., 2006, Kalichman et al., 2002, Maisto et al., 2010). However, no studies have assessed reasons for abstaining, decreasing drinking, or maintaining low levels of drinking (hereafter termed "reasons for limiting drinking") in patients living with HIV.

Reasons for limiting drinking have been studied in other populations, including young adults and college students (Emery et al., 1993, Hesselbrock et al., 1987, Huang et al., 2011, Johnson, 2004, de Visser and Smith, 2007), high school students (Stritzke and Butt, 2001), problem drinkers (Kranitz, 2008, Matzger et al., 2005), and recovering alcoholics (Amodeo and Kurtz, 1998). Some studies have reported on reasons specific to the population studied, for example regaining control of one's life in recovering alcoholics (Amodeo and Kurtz, 1998) and fear of arrest for underage drinking in students (Johnson, 2004). More general reasons for limiting drinking have also been studied, including upbringing/lifestyle, concern about social disapproval, monetary concerns, disinterest, dislike of taste, and concerns about negative effects of alcohol (Bernards et al., 2009, Emery et al., 1993, Hesselbrock et al., 1987, Huang et al., 2011, Knupfer and Room, 1970, Matzger et al., 2005, Moore and Weiss, 1995, Slicker, 1997, de Visser and Smith, 2007, Weiss and Moore, 1995). Given the health consequences of heavy drinking among those with HIV, the lack of information on reasons

for limiting drinking in this population represents an important gap in the literature on understanding drinking among those living with HIV.

The purpose of the current study was therefore to provide information on self-reported reasons for limiting drinking in a sample of HIV primary care patients, and the associations between these reasons and patients' drinking. Patients were part of a larger alcohol intervention study (Hasin et al., 2013), and all had at least one recent instance of heavy drinking. We first investigated the factor structure of a set of reasons for limiting drinking. We then determined the internal consistency and inter-relatedness of the factors. Finally, we examined the associations of the factors with measures of alcohol consumption and dependence in a series of validation models.

Materials and Methods

Participants and procedures

Participants were 254 HIV-positive patients recruited from a large, urban HIV primary care clinic for participation in a randomized clinical trial of brief alcohol reduction interventions (Hasin et al., 2013). Inclusion criteria required at least one heavy drinking occasion (four or more drinks) in the past month. Data analyzed in the present report were collected via Audio Computer-Assisted Self-Interview (A-CASI) in English or Spanish (patients' preference) at baseline assessment, after enrollment in the study but prior to intervention participation. As described elsewhere (Elliott et al., in press), participants were mostly male (78.0%), and African American (49.6%) or Hispanic (44.9%). Their average age was 45.7 years (s.d. = 8.1; range = 22–68). The majority had completed high school or a graduate equivalency degree (58.1%). Participants had received their HIV diagnosis on average 12.8 (s.d. = 7.6) years previously, and most (77.1%) were on HIV medication.

Measures

Reasons for limiting drinking—Twenty-seven items addressed reasons for limiting drinking. Some items were adapted from previous research (particularly (Greenfield et al., 1989)), and other items were included to address common concerns and/or consequences of alcohol use. Participants rated their agreement with each item on a five-point scale ranging from “agree strongly” to “disagree strongly.” Given the variability in factors obtained in prior research (Emery et al., 1993, Huang et al., 2011, Johnson, 2004, Stritzke and Butt, 2001, Matzger et al., 2005, Amodeo and Kurtz, 1998), specific factors were not proposed, but were determined empirically via exploratory factor analysis.

Alcohol and drug use—Alcohol consumption was assessed with items from the Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS), covering the time frame of the last 12 months. We analyzed five of the AUDADIS drinking measures in order to examine different aspects of drinking patterns. These included typical quantity (number of drinks consumed per typical drinking day) and typical frequency (how often consumed any alcohol). Additional measures covered heavier aspects of alcohol consumption in the last 12 months, including maximum drinks per occasion, frequency of binge drinking (five or more drinks in one day for men, four or more for women), and

frequency of drinking to intoxication (characterized by slurred speech, unsteadiness, blurred vision). All frequency items were rated using an eleven-point response scale ranging from “every day” (1) to “never” (11). The AUDADIS alcohol consumption items reflect international guidelines for measurement of alcohol consumption (Dawson and Room, 2000). Evidence of good-to-excellent test-retest reliability for the AUDADIS alcohol consumption measures has been found in the US general population (Grant et al., 2003), substance abuse and psychiatric patients (Hasin et al., 1997a), and Latino primary care patients (Canino et al., 1999). For descriptive purposes, the AUDADIS was also used to assess for past-year illicit drug use. Assessed drugs included: cocaine/crack, marijuana, painkillers, sedatives, heroin/opium/methadone, tranquilizers/anti-anxiety drugs, stimulants, hallucinogens, inhalants/solvents, and an “other” category.

Alcohol dependence—Alcohol dependence in the past year was also assessed using the AUDADIS. Three or more of the assessed criteria were required for diagnosis, consistent with the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (American Psychiatric Association, 1994). The AUDADIS diagnosis of alcohol dependence has very good reliability and validity (Canino et al., 1999, Grant et al., 2003, Grant et al., 1995, Hasin et al., 1997b, Hasin et al., 2006, Hasin et al., 2007).

Demographic and HIV information—Consistent with previous research on this sample (Elliott et al., in press), we controlled for the following demographic variables: age, ethnicity, gender, highest level of education, and preferred language for study completion. We also controlled for whether patients were on HIV medication, and the number of years since HIV diagnosis.

Analysis plan

First, basic drinking and drug use data from the sample are presented. We summarized the mean (s.d.) typical and maximum quantity, and the median values for frequency, binge frequency, and intoxication frequency. The rate of alcohol dependence is presented, along with the rate of past-year illicit use of various substances.

Second, to assess the factor structure of the 27 items, an exploratory factor analysis was conducted using principal factor, or common factors extraction. Eigenvalues and scree plots were used to determine the number of factors. Once the number of factors was determined, an oblique (promax) rotation was implemented, allowing the factors to correlate. Rotated factor loadings were evaluated to determine content of the factors; items with a loading of 0.45 or greater on one factor and less than 0.32 on all other factors were retained (Tabachnick and Fidell, 2007). Items that did not fit conceptually with other items on the factors were then removed to enhance cohesiveness of the subscales.

Third, basic information on the newly created “reasons for limiting drinking” scales were then obtained. We summarized the mean, standard deviation, and range for all new scales. We then assessed internal consistency of the subscales using Cronbach alphas. We also assessed the degree to which patients responded similarly to the factors (i.e., the degree to which reasons co-occurred for patients) by determining the magnitude to which subscales

were correlated. These correlations were interpreted using Cohen's guidelines for small ($r = 0.10$), medium ($r = 0.30$), and large ($r = 0.50$) correlations (Cohen, 1992).

Fourth, we examined the associations between scores on the reasons for limiting drinking scales and the measures of alcohol consumption. We assessed bivariate correlations between the reason factors and the five alcohol consumption outcomes. Spearman correlations were used due to non-normal alcohol consumption variables. For ease of direct interpretation of correlation values, frequency data were reversed for these bivariate correlations only, such that higher values indicated higher frequency (1=never and 11=every day). Then, to assess associations corrected for relevant demographic and HIV variables, we constructed a series of generalized linear models using PROC GENMOD in SAS (SAS Institute Inc, 2011). Three models were run for each of the five consumption variables, due to concern about multicollinearity. Each model was built with the original consumption variable as the outcome, a reasons for limiting drinking factor as a predictor, and demographic and HIV-related variables as covariates (age, ethnicity, gender, education, language, HIV medication status, number of years since diagnosis). The choice of models (negative binomial and Poisson) was based on the distributions of the alcohol consumption outcome variables, as determined by fit statistics provided by SAS. Negative binomial models demonstrated the best fit for typical and maximum quantity variables (as compared with Poisson and normal distributions). Negative binomial and Poisson distributions yielded comparable fit statistics for frequency, binge frequency, and intoxication; Poisson models were used for these variables.

Finally, to assess the associations of the three reason variables with alcohol dependence, we ran three logistic regressions using PROC LOGISTIC in SAS (SAS Institute Inc, 2011). Each model specified past-year dependence as the outcome, one of the reasons as predictors, and the demographic and HIV variables as covariates. For descriptive purposes, dependence rates for individuals scoring (a) above versus (b) at or below the median on the reasons subscales were then summarized.

Results

As reported previously (Elliott et al., in press), participants reported typically consuming a mean of 5.68 (s.d. = 3.49) drinks per occasion, with a maximum consumption of 11.29 drinks (s.d. = 6.40). Median values for other consumption measures indicated that patients most commonly drank 3–4 times a week, binged twice a week, and drank to intoxication once a week. Also reported previously (Hasin et al., 2013), the rate of past-year alcohol dependence was 48.22%.

The rate of past-year illicit drug use was high for cocaine/crack ($n=83$; 32.8%) and marijuana ($n=82$; 32.4%). Rates were also relatively high for painkillers ($n=38$; 15.0%), sedatives ($n=29$; 11.5%), and heroin/opium/methadone ($n=23$; 9.1%). Rates were lower for tranquilizers/anti-anxiety drugs ($n=11$; 4.3%), stimulants ($n=8$; 3.2%), hallucinogens ($n=8$; 3.2%), inhalants/solvents ($n=6$; 2.4%), and other drugs ($n=3$; 1.2%).

Factor analysis

The scree plot and eigenvalues from the exploratory factor analysis both indicated that three factors should be retained (first five eigenvalues: **7.69, 2.78, 1.21**, 0.83, 0.70). For the rotated three-factor model, standardized regression coefficients indicated that item content for the three factors largely addressed limiting drinking (a) for social reasons, (b) because alcohol is incompatible with one's lifestyle, and (c) due to concerns about consequences and impairment from drinking. Five items were removed due to insufficient loadings, and seven items were removed due to conceptual inconsistency with remaining items on the factors. Due to overlap in content between two items on the lifestyle subscale (addressing dieting and alcohol calorie content, $r = 0.81$, $p < .0001$), the diet item was removed. Two items addressing adverse consequences other than impairment were also removed, allowing the third subscale to be more narrowly categorized as an "impairment" scale (impaired functioning in physical, psychological, cognitive domains). Item scores within each factor were then summed to create scale scores and the scores were reversed so that higher scores indicated more endorsement of the reasons for limiting drinking in that category. Loadings for final retained items are indicated in Table 1 (for all items see Supplemental Table 1).

The final scale of reasons for limiting drinking contained 12 items. The social reasons for limiting drinking subscale contained four items (e.g., don't want to drink more than friends), with possible scores ranging from 1–17. The mean score was 7.06 (s.d. = 4.60; range 1–17). The lifestyle reasons for limiting drinking subscale contained three items (e.g., alcohol is high in calories), with possible scores ranging from 1–13. The mean score was 3.92 (s.d. = 3.07; range 1–13). The impairment reasons for limiting drinking subscale contained five items (e.g., drinking too much makes me tired the next day), with a possible range of scores from 1–21. The mean score was 13.46 (s.d. = 4.77; range: 1–21).

Internal consistency

Internal consistency was good to excellent for the three subscales: $\alpha=0.86$ for Social Reasons, $\alpha=0.83$ for Lifestyle Reasons, and $\alpha=0.76$ for Impairment Reasons.

Inter-factor correlations

The social and lifestyle factors evidenced a large correlation ($r = 0.67$, $p < 0.0001$). The impairment factor yielded small-to-medium correlations with social ($r = 0.19$, $p < 0.01$) and lifestyle ($r = 0.23$, $p < 0.001$) factors.

Bivariate correlations

Correlations among all reasons for limiting drinking and drinking measures can be found in Table 2. Patients reporting more social reasons for limiting drinking consumed less on their maximum occasion ($r = -0.23$, $p < 0.001$), and had lower binge ($r = -0.20$, $p < 0.01$) and intoxication ($r = -0.16$, $p < 0.01$) frequencies. Those reporting more lifestyle reasons also reported less on their maximum occasion ($r = -0.16$, $p < 0.05$), as well as lower binge ($r = -0.13$, $p < 0.05$) and intoxication ($r = -0.19$, $p < 0.01$) frequencies. Higher reported impairment reasons were associated with higher typical quantity ($r = 0.14$, $p < 0.05$) and intoxication frequency ($r = 0.15$, $p < 0.05$).

Validation models: Alcohol consumption

A higher endorsement of social reasons to limit drinking was associated with lower typical quantity ($B=-0.02$, $X^2=6.87$, $p<0.01$) and maximum quantity ($B=-0.04$, $X^2=20.87$, $p<0.0001$). It also predicted lower binge frequency ($B=0.03$, $X^2=27.07$, $p<0.0001$), and marginally lower intoxication frequency ($B=0.01$, $X^2=3.34$, $p=0.07$), but no difference in typical frequency ($B=0.01$, $X^2=1.41$, $p=0.24$).

A higher endorsement of lifestyle reasons to limit drinking was associated with lower maximum consumption ($B=-0.04$, $X^2=11.00$, $p<0.001$), and less frequent binge drinking ($B=0.04$, $X^2=16.41$, $p<0.0001$) and intoxication ($B=0.02$, $X^2=7.16$, $p<0.01$). More lifestyle reasons also predicted marginally fewer drinks per drinking day ($B=-0.02$, $X^2=3.80$, $p=0.051$) but was unrelated to typical frequency ($B=0.01$, $X^2=0.56$, $p=0.45$).

Patients reporting more impairment reasons for limiting drinking reported more frequent drinking ($B=-0.02$, $X^2=4.03$, $p<0.05$) and intoxication ($B=-0.02$, $X^2=10.51$, $p<0.01$), and marginally more frequent binge drinking ($B=-0.01$, $X^2=2.80$, $p=0.09$). Impairment reasons were unrelated to typical quantity ($B=0.01$, $X^2=1.56$, $p=0.21$) and maximum quantity ($B=0.01$, $X^2=1.40$, $p=0.24$).

Validation model: Alcohol dependence

Lifestyle and social factors were not associated with risk for alcohol dependence (Lifestyle: Adjusted Odds Ratio [AOR]=1.07, 95% Confidence Interval [95% CI]=0.98–1.17; Social AOR=1.04, 95% CI=0.98, 1.10). However, higher scores on the impairment scale was associated with higher risk for alcohol dependence (AOR=1.15, 95% CI=1.08, 1.23). When the impairment scale was dichotomized, only about a third of patients scoring at/below the median on the impairment reasons scale met criteria for alcohol dependence. In contrast, the majority of patients scoring above the median were alcohol dependent (Table 3).

Discussion

This is the first study to investigate reasons for limiting drinking in HIV primary care patients, an important population in which to study drinking due to their elevated risk for medical consequences. The current study indicated three types of reasons: (a) social reasons, (b) seeing alcohol as incompatible with one's lifestyle, and (c) concern over potential impairment caused by alcohol. Patients who reported more social reasons and who saw alcohol as inconsistent with their lifestyle generally drank less; these reasons therefore appear somewhat protective against certain aspects of heavy drinking. In contrast, limiting drinking due to concerns about impairment was associated with overall higher levels of alcohol involvement. These reasons were likely salient to heavy and problematic drinkers due to their greater familiarity with alcohol-induced impairment. These general trends in results were consistent regardless of whether demographic and HIV characteristics of the sample were controlled.

The factors we found have precedent in the previous literature in non-HIV populations, and evidenced similar associations with alcohol involvement. Social reasons for limiting drinking were negatively associated with drinking, consistent with prior research (Huang et

al., 2011, Stritzke and Butt, 2001). The factor representing lifestyle reasons for limiting drinking, although eclectic in content, contains items (e.g., religion, upbringing) used in previous scales, where they were negatively associated with drinking (Bernards et al., 2009, Huang et al., 2011, Slicker, 1997, Stritzke and Butt, 2001). However, other content from the lifestyle scale (i.e., concern about calories) is novel to the current study. Reasons for limiting drinking due to potential impairment were positively associated with drinking in this study as well as in previous research (Hesselbrock et al., 1987). Although one other study found a *negative* association between an impairment/consequence scale and drinking (Stritzke and Butt, 2001), these researchers defined impairment/consequence more broadly (including legal trouble and health issues) than our scale, which measured more immediate subjective consequences. The current study also presents associations between reasons for limiting drinking and alcohol dependence status, providing information on the reasons reported by drinkers with a diagnosable alcohol disorder. The authors are not aware of any studies that assessed associations between reasons for limiting drinking and dependence in any population, making our findings a novel contribution to the literature on reasons for limiting drinking. However, overall, the subscales we found and their associations with alcohol consumption are generally consistent with research in other populations, supporting the appropriateness of this construct for individuals with HIV. Use of the new scale created in this study can facilitate further research on reasons for limiting drinking among those with HIV, a high risk group.

In addition to expanding upon the literature on reasons for limiting drinking, this study also enhances our understanding of cognitive-motivational factors related to drinking among individuals with HIV. Interestingly, HIV-positive heavy drinkers endorse social issues as reasons *for* drinking (e.g., for social facilitation, in response to social pressure; (Elliott et al., in press)) as well as reasons for limiting drinking (e.g., due to social responsibilities, to avoid social disapproval). This suggests that social issues are related to drinking in complex ways. However, psychological problems serve more as reasons *for* drinking (Elliott et al., in press), whereas lifestyle issues and impairment appear to function more as deterrents from drinking. These two complementary areas of research, when considered together, enhance understanding of the decisional processes in this high-risk group.

Limitations of the study are noted. First, item content could potentially have been more comprehensive. Yet, efforts were made to be thorough in content, basing the scale partly on previous work, but expanding it to include additional concerns about and consequences of drinking. Second, some items did not load on any factor and thus their associations with drinking were not explored in the current analyses. However, we suggest that the factors obtained in the present study are important in indicating themes in participants' reasons, and allow for more robust statistical analyses than use of single items. Third, generalizability must be considered. The current sample is comprised of patients from one large urban HIV primary care clinic in the northeastern United States, creating potential limitations to generalizability. However, the assessed sample includes large proportions of minority groups over-represented in the HIV epidemic, supporting generalizability. Other characteristics of the sample may also affect generalizability. The patients were enrolled in a study designed to decrease drinking, after being identified through outreach and screening

(with few refusals to participate; (Hasin et al., 2013)). Enrolled patients completed the measures before participating in the intervention. Patients willing to enroll in the study may differ from other HIV patients in reasons for limiting drinking, although we think this is unlikely because (a) our patients were not independently seeking treatment, and (b) few refused (suggesting that self-selection into the study was not a major concern). However, studies in samples not enrolled in treatment studies would be needed to determine this. Further, patients evidenced heavy drinking patterns and relatively high rates of drug use, which could limit the generalizability of these findings to HIV patients who drink less and abstain from drugs. However, heavy drinkers are most at risk for medical consequences, making understanding their drinking patterns (and their reasons for restricting drinking) of primary concern for intervention planning. High rates of drug use are not surprising, as drug use is high in HIV populations (Mimiaga et al., 2013, Bing et al., 2001, Gebo et al., 2003), some HIV infections were likely due to drug use, and because medicinal marijuana has gained increasing cultural acceptance in the past decade. Finally, the current study is cross-sectional in nature, so causation cannot be inferred. Prospective studies are needed to clarify temporal sequence. Only experimental studies that manipulate patients' reasons for limiting drinking could be used to truly make causal inferences about these associations.

The current study also demonstrates several strengths. Given the serious medical consequences of heavy drinking for this group, better understanding the cognitive-motivational factors related to alcohol consumption and dependence among HIV patients is an important task that could inform intervention efforts. This is the first study to assess reasons for limiting drinking in this population, also making the current study a novel application of this widely studied construct. Another strength was the sample itself; although the patients in the current study all reported a recent heavy drinking episode, there was substantial variability in their drinking levels (Hasin et al., 2013), allowing for understanding of reasons associated with different drinking patterns. A substantial proportion with alcohol dependence also allowed for analyses by dependence status. Additionally, this study measured alcohol consumption and dependence using the AUDADIS, a well-validated measure used extensively in the US and abroad (Hasin et al., 1997b, Caetano et al., 2010, Dawson et al., 1995, Moss et al., 2010, Shmulewitz et al., 2012, Keyes et al., 2008, Canino et al., 1999, Carpenter and Hasin, 1998, Hasin et al., 1997a), and yields a new scale that could be used in assessing reasons for limiting drinking in future research. Future research using this scale could help determine whether: (a) the factor structure replicates in confirmatory factor analyses in similar samples, (b) findings generalize to HIV-positive drinkers that differ in demographic composition or drinking level, and (c) specifically incorporating reasons for limiting drinking in the domains specified by the subscales would serve as useful components of drinking-reduction interventions with HIV-positive heavy drinkers.

Adding to the previous literature on reasons for limiting drinking in other populations (Huang et al., 2011, Stritzke and Butt, 2001, Bernards et al., 2009, Slicker, 1997, Hesselbrock et al., 1987), this study enhances understanding of reasons for limiting drinking, and does so uniquely in an HIV-positive sample. Knowledge of factors contributing to the decision to drink or abstain in such samples is important, since the risk for medical consequences of heavy drinking in these patients, all of whom are ill, is

substantial. Reasons for limiting drinking in this HIV sample were varied, and ranged from concern over one's immediate social environment to broad lifestyle reasons to concerns about impairment caused by high levels of drinking. As the first two types of reasons for limiting drinking are associated with efforts to retain aspects of one's identity and social environment without disruption by alcohol, they are more similar to (and highly correlated with) one another than the impairment scale; high endorsement on either subscale is associated with lower levels of alcohol use. In contrast, the third reason addresses impairment caused by heavy alcohol use, and thus is endorsed more by heavy drinkers and those with alcohol dependence, who have likely experienced such impairment. These findings have implications for providers working with HIV-positive drinkers. Social and lifestyle reasons for limiting drinking are reasons that could be supported and validated by medical providers in less extreme drinkers who already see alcohol as inconsistent with their sense of self or social environment. Provider support for continued lower levels of drinking due to these reasons may reinforce limited drinking and perhaps even lead to further reduction. However, expected impairment is a reason for limiting drinking among *heavier* (and often dependent) drinkers, and may thus indicate reasons such patients do not drink even more than they already do. A provider working with heavy/problematic drinkers reporting such reasons could highlight these concerns when discussing ambivalence about drinking (a common component of motivational interviewing and related techniques) in an effort to help the patient recognize the need to drink less. Whether addressing reasons for limiting drinking (organized by the subscales found in this study) would serve as a useful addition to interventions focused on what leads patients to drink (such as Cognitive Behavioral Therapy) is unknown; utility of including such content could be explored. These findings offer potential directions for better understanding and working with HIV-positive drinkers whose drinking levels require reduction to avoid serious health consequences.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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Table 1

Final reasons for limiting drinking items: Rotated factor loadings.

	Social	Lifestyle	Impairment
Social items			
I don't drink more than I do because I don't want to drink more than my spouse or the person I'm involved with.	0.80	0.08	-0.04
I don't drink more than I do because I don't want to drink more than my friends.	0.69	0.15	-0.11
I don't drink more than I do because I want to avoid problems at work or school.	0.78	0.01	0.00
I don't drink more than I do because I have a responsibility to my family.	0.57	0.17	0.03
Lifestyle items			
I don't drink more than I do because of religious or moral reasons.	0.29	0.53	0.01
I don't drink more than I do because alcohol is high in calories.	0.03	0.84	-0.06
I don't drink more than I do because I was brought up not to drink.	0.19	0.65	-0.02
Impairment concern items			
I have found that drinking too much impairs my judgment.	-0.02	-0.06	0.57
Drinking too much makes me tired the next day.	-0.01	-0.14	0.75
Drinking too much gives me hangovers.	0.18	-0.22	0.67
Drinking too much makes me feel depressed.	0.00	0.10	0.57
If I drank more, I might lose control of my drinking.	0.02	0.05	0.54

Note. Bold italics indicate loading on factor. Removed items are available in Supplemental Table 1.

Table 2
Bivariate (Spearman) correlations between reasons for limiting drinking and alcohol consumption.

	Social reason	Lifestyle reason	Impairment reason	Drinks/ drinking day	Maximum quantity	Frequency (I= never; 11= every day)	Binge frequency (I= never; 11= every day)	Intoxication frequency (I= never; 11= every day)
Social reason	-	0.67 <0.0001	0.19 <0.01	-0.07 0.25	-0.23 <0.001	-0.10 0.10	-0.20 <0.01	-0.16 <0.01
Lifestyle reason	-	-	0.23 <0.001	-0.05 0.39	-0.16 <0.05	-0.08 0.22	-0.13 <0.05	-0.19 <0.01
Impairment reason	-	-	-	0.14 <0.05	0.09 0.15	0.10 0.11	0.10 0.12	0.15 <0.05
Drinks per drinking day	-	-	-	-	0.64 <0.0001	0.30 <0.0001	0.54 <0.0001	0.38 <0.0001
Maximum quantity	-	-	-	-	-	0.36 <0.0001	0.59 <0.0001	0.37 <0.0001
Frequency (I= never; 11= every day)	-	-	-	-	-	-	0.72 <0.0001	0.51 <0.0001
Binge frequency (I= never; 11= every day)	-	-	-	-	-	-	-	0.57 <0.0001

Note. Spearman correlations are presented, with p-values below. Original drinking frequency values are reversed for bivariate correlations, such that I=never and 11=every day.

Table 3
Alcohol dependence rates (%) for individuals scoring low versus high in each reason subscale

Reason to limit drinking subscale	Percent of the sample with alcohol dependence	
	At/below median on subscale	Above median on subscale
Social	46.15	50.41
Lifestyle	44.38	57.33
Impairment concerns	36.64	60.66*

Note.

* $p < 0.001$ for logistic regression using continuous reason as predictor of alcohol dependence, controlling for age, ethnicity, gender, education, preferred language, HIV medication status, and the number of years since HIV diagnosis.. Higher values indicate higher rates of dependence.