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Perceived Positive Consequences Are Associated with Unhealthy Alcohol Use Among Persons Living with HIV

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Abstract

Background: Understanding how perceived positive consequences are associated with drinking may help improve effectiveness of alcohol reduction interventions among people living with HIV (PLWH). We aimed to determine whether perceived positive consequence scores varied by sociodemographic, drinking, mental health or substance use variables.

Methods: Perceived positive consequences of drinking were assessed using the PROMIS: Positive Consequences—Short Form. Unhealthy alcohol use was measured using a modified AUDIT-C. We used multiple linear regression to identify factors associated with perceived positive consequence.

Results: 328 PLWH who consumed at least one alcoholic beverage in the last 6 months participated in the Florida Cohort study (mean age=46, 69% male, 58% Black). Perceived positive consequence scores ranged from 0 to 28 (mean=16.1, SD=6.9). Perceived positive consequence scores increased by 0.8 points for each 1-point increase in AUDIT-C score. Demographics, thoughts on reducing alcohol use, other substance use, depression, and anxiety were not significantly associated with perceived positive consequences.

Conclusions: Our findings suggest perceived positive consequences are associated with unhealthy alcohol use. Positive consequences should be considered with negative consequences in a decisional balance when intervening on alcohol use among PLWH.

Abstract

Comprendre comment les conséquences positives perçues sont associées à la consommation d'alcool peut aider à améliorer l'efficacité des interventions de réduction de l'alcool chez les personnes vivant avec le VIH (PVVIH). Nous avons cherché à déterminer si les scores des

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conséquences positives perçues variaient selon les variables sociodémographiques, de consommation d'alcool, de santé mentale ou de consommation de substances.

Les conséquences positives perçues de la consommation d'alcool ont été évaluées à l'aide du PROMIS: Positive Consquences - Short Form -conséquences positives—version abrégée. La consommation d'alcool malsaine a été mesurée à l'aide d'un AUDIT-C modifié. Nous avons utilisé une régression linéaire multiple pour identifier les facteurs associés aux conséquences positives perçues.

328 PVVIH ayant consommé au moins une boisson alcoolisée au cours des 6 derniers mois ont participé à l'étude de la cohorte de Floride (âge moyen=46 ans, 69% d'hommes, 58% de noirs). Les scores des conséquences positives perçues allaient de 0 à 28 (moyenne=16.1, ET=6.9). Les scores de conséquences positives perçues ont augmenté de 0.8 point pour chaque augmentation de 1 point du score AUDIT-C.

Les données démographiques, les réflexions sur la réduction de la consommation d'alcool, la consommation d'autres substances, la dépression et l'anxiété n'étaient pas associées de manière significative aux conséquences positives perçues.

Nos résultats suggèrent que les conséquences positives perçues sont associées à une consommation d'alcool malsaine. Les conséquences positives doivent être considérées avec des conséquences négatives dans le processus décisionnel lors de l'intervention sur la consommation d'alcool chez les PVVIH

Keywords

alcohol; HIV; negative consequences; positive consequences; unhealthy drinking

Mots clés:

alcool; conséquences négatives; conséquences positives; mauvaise consommation d'alcool; VIH

BACKGROUND

Despite increased vulnerability to alcohol-related harm, persons living with HIV (PLWH) commonly report alcohol use.[1] In fact, findings from 2 large, nationally representative studies indicate that over half of PLWH reported consuming alcohol at least once in the past year,[2,3] and up to 34% reported current unhealthy alcohol use (ie, consuming ≥7 and 14 drinks per week and/or ≥3 and 4 drinks on one occasion for women and men, respectively).[4,5] A recent meta-analysis estimated that almost 30% of PLWH may have an alcohol use disorder (AUD), compared to 14% in the general population.[6] Among PLWH, unhealthy alcohol use poses a unique challenge due to its association with poorer HIV-related health outcomes (eg, antiretroviral therapy [ART] adherence, viral suppression), which may contribute to the transmission of HIV.[7–9] Further, HIV has a considerable economic impact, as recent estimates suggest that the public health costs approximates 23 billion dollars (USD) annually.[10] As such, it is critically important to identify factors related to unhealthy

alcohol use among PLWH to design and target more efficacious behavioral interventions to reduce alcohol use.[11,12]

Perceived positive consequences from drinking is one potentially relevant factor related to unhealthy alcohol use among PLWH. For this study, we define perceived positive consequences as pleasant feelings or experiences that a person attributes to be a direct effect of their own alcohol use, such as having fun, feeling at ease, or feeling confident. It is necessary to note that perceived positive consequences are distinct from alcohol expectancies and motives for drinking. That is, perceived positive consequences consider the frequency of experiencing a consequence in the past, whereas expectancies and motives deal with what people expect or hope to happen when they drink alcohol. It is likely, however, that perceived positive consequences, expectancies, and motives are interconnected.

Prior research has found relations between perceived positive consequences and unhealthy alcohol use cross-sectionally and prospectively.[13–17] For example, Lee and colleagues found that among young adults with unhealthy alcohol use, more positive alcohol-related consequences experienced on a given day predicted next day positive alcohol expectancies and number of drinks consumed (if it was a drinking day).[13] In another study of young adults who drink socially, perceived positive consequences from alcohol and heavy drinking (ie, consuming 5/4+ drinks in a day for males and females, respectively) were reciprocally related, such that greater self-reported perceived positive consequences from alcohol at baseline predicted heavy drinking frequency one month later and vice versa. However, all prior studies linking perceived positive consequences to drinking outcomes have included samples consisting of college students or treatment-seeking veterans. Thus, determining whether perceived positive consequences of drinking are related to unhealthy alcohol use specifically among PLWH is warranted.

Among PLWH, other factors related to unhealthy alcohol use include mental health disorders (ie, depression and anxiety).[1,18] Such stressors may be more common in PLWH than in the general population, with one large multisite study reporting that 36% of PLWH had major depression and 16% had generalized anxiety disorder, compared to 6.7 and 2.1%, respectively, in the general population.[19] Another study found that while only a small percent of persons with anxiety disorders report drinking to relieve symptoms, those who do report self-medication tend to drink more and are at greater risk for developing an AUD.[20] It is likely that persons who use alcohol to self-medicate for mental health disorders may perceive their experiences with alcohol as positive. These examples suggest that understanding such perceived positive consequences (eg, feeling at ease) is critical in interventions to reduce drinking or even the prevalence of AUD. Consistent with motivational interviewing, such positive experiences could be acknowledged and considered when weighing the decision to quit or reduce drinking. Perceived positive consequences of alcohol use may be associated with whether a person is willing to consider or is interested in reducing their alcohol use; balancing positive consequences with negative consequences may be necessary to encourage behavior change. It is also likely that as positive consequences of alcohol use may lead to increased drinking, more negative consequences of drinking will be present.[21] Substance use (other than alcohol) has also been implicated as an

associate to unhealthy drinking and negative consequences of alcohol use, thus may also be associated to positive consequences of alcohol use.[4]

Further clarification of the relations between empirically supported risk-factors (eg, mental health disorders), perceived positive consequences of drinking, and alcohol-related outcomes among PLWH are badly needed. Effective interventions to reduce alcohol use among PLWH are scarce and most interventions aim to reduce alcohol use indirectly.[11] In order to address the literature gap regarding factors associated with perceived positive consequences of alcohol use among PLWH, we conducted a secondary analysis using a cohort of PLWH in Florida. We aimed to (1) identify the proportion of PLWH who drink with specific perceived positive consequences of alcohol use and (2) determine whether overall perceived positive consequences varied by sociodemographic characteristics, drinking variables, and/or mental health or substance use variables. We hypothesized that PLWH with unhealthy alcohol use would experience a greater proportion of perceived positive consequences compared to PLWH without unhealthy alcohol use. We also hypothesized that unhealthy alcohol use, increased negative consequences of alcohol use, other substance use, depression, and anxiety would be related to greater perceived positive consequences among PLWH.

METHODS

Study population

The study sample included 328 PLWH from the Florida Cohort who self-reported consuming at least one alcoholic beverage in past 6 months. The Florida Cohort is a statewide study that aims to identify factors that influence health outcomes among PLWH. Participants were recruited from 9 sites throughout the state of Florida, including community settings, public health clinics, and private clinics. Individuals were eligible to participate if they were at least 18 years old and had an HIV diagnosis. Following initial enrollment (n=932), participants (n=569) completed follow-up surveys concerning health-related behaviors, substance use, sexual behaviors, and other questions associated with HIV-related health outcomes 6 months later between October 2014 and December 2018. Participants completed the survey themselves using a pen-and-paper format. The institutional review boards (IRBs) at all participating institutions approved this study and all participants gave informed consent prior to enrollment. Participants were compensated with a $25 gift care for completing the survey. Additional details about the study procedures have been published elsewhere.[8,22]

Measures

Demographic variables were obtained at the baseline visit and included age, sex, race, ethnicity, and education. All other variables were obtained at the 6-month follow-up.

Perceived Positive Consequences of Drinking—Perceived positive alcohol consequences were assessed using the Patient-Reported Outcomes Measurement Information System (PROMIS) Alcohol Use: Positive Consequences—Short Form 7a.[23] The PROMIS scales were developed as part of an National Institutes of Health (NIH) initiative developed to provide better measurement tools for a plethora of outcomes, including alcohol

use.[24] All of the alcohol-related scales have been validated among persons with AUD.[24] This scale consists of 7 items which can be found in Table 1, each with 5 response options ranging from 0 "*never*" to 4 "*almost always*". When answering questions related to the positive and negative consequences of drinking, participants were instructed to think about their experiences with alcohol in the past 30 days.

Negative Consequences of Drinking—Alcohol-related negative consequences were measured using the PROMIS Alcohol Use: Negative Consequences—Short Form 7a.[23] This scale consists of 7 items (Table 1) with 5 response options ranging from 0 "*never*" to 4 "*almost always*".

Alcohol Use—Alcohol consumption was measured using a modified Alcohol Use Disorders Identification Test Consumption (AUDIT-C). The AUDIT-C has previously been validated to use in primary care settings,[25] which is where the majority of our sample was recruited. Participants were asked "In the past 6 months, how often did you have a drink containing alcohol?" (options: <1 to 3 times a month, 1 to 3 times a week, 4 to 6 times a week, every day), "How many standard drinks would you have on a typical day when you were drinking?" (options: 1 to 2, 3 to 4, 5 to 6, 7 to 9, 10+), and "In the past 6 months, how often did you have 4 (or more) standard drinks (for women) or 5 (or more) standard drinks (for men) on one occasion?" (options: never, less than once a month, monthly, weekly, daily or almost daily).

Interest in Reducing Current Alcohol Use—Participants were asked "What are your thoughts about cutting back on drinking alcohol?" to assess readiness for change. This question was developed specifically for our study. The following answer choices were given: "*I am not interested in cutting back on my drinking at this time*"; "*I would like to cut back on my drinking sometime, but not now*"; and "*I am currently trying to cut back on my drinking*".

Depressive and Anxiety Symptoms—Mental health was assessed at baseline using the Patient Health Questionnaire (PHQ)-8[26] and the Generalized Anxiety Disorder (GAD)-7[27] for depressive and anxiety symptoms, respectively. A total score of ≥10 on the PHQ-8 indicated clinically significant levels of depressive symptoms[26] and a total score ≥10 indicated clinically significant levels of anxiety symptoms.[27] Both scales have demonstrated high validity and reliability among PLWH.[26,28]

Other Substance Use—Participants were asked about frequency of substances use (other than alcohol) in the past 6 months. Substances included marijuana, heroin, cocaine, methamphetamine, pain medication, sedatives, and ecstasy. Substance use was later dichotomized to yes or no.

Statistical analysis

To determine the proportion of PLWH with specific perceived positive consequences of alcohol use, we conducted descriptive analysis of the frequency of perceived positive alcohol consequences. Participants were dichotomized to at least sometimes experiencing the

perceived positive consequence or rarely/not experiencing the consequence for each of the 7 perceived positive consequences. Modified AUDIT-C scores were calculated similarly to the original AUDIT-C (ie, each item ranged from 0 to 4) and were dichotomized to compare specific perceived consequences between persons with unhealthy drinking (≥3 for women, ≥4 for men) and persons without unhealthy drinking.[25]

To address factors associated with a greater number of perceived positive consequences, we utilized pro-rated raw scores for the PROMIS Positive Consequences Short Form (a continuous measure). Values were calculated for each participant as recommended by the measure guidelines.[23]

Next, we conducted descriptive analyses to assess baseline characteristics that were associated with perceived positive consequences of drinking. Total negative consequences of drinking scores were categorized into tertiles (low, medium, and high). Nonnormality was addressed by using Kruskall-Wallis tests to examine group differences for categorical variables. A multiple linear regression model was conducted to identify factors associated with perceived positive consequence scores (continuous), including variables with a P value ≤0.10 in the bivariate analyses; pro-rated score of perceived positive consequences was used as the outcome variable. Significance was assessed at the $P<0.05$ level. No multicollinearity was found by examining the condition index. All statistical analyses were conducted using SAS 9.4.

RESULTS

Of the 569 participants who completed the 6-month follow-up survey, 216 did not drink alcohol in the past 6 months and were excluded from the present analyses. Another 7 participants had >50% missing data on the outcome of interest and were thus excluded from the analyses. The final study sample for analyses consisted of 328 PLWH. Characteristics of the 328 participants are presented in Table 2. The majority of participants were aged 45 or older (63%), male (69%), nonHispanic Black, and had at least a high school level education (Table 2). The mean AUDIT-C score was 5.1 (SD=2.7, range 2 to 14) and over a third reported other substance use (37%). Approximately one-third of participants screened positive for depression (33%) and anxiety (31%). The sample was diverse in terms of thoughts on cutting back drinking (Table 2). The mean perceived positive consequence score was 16.3 (SD=6.9, range 0 to 28) and the mean negative consequence score was 11.5 (SD=5.6, range 0 to 28).

Proportion of PLWH who drink with specific perceived positive consequences

PLWH who self-reported unhealthy alcohol use were statistically more likely to sometimes, often, or almost always experience each individual perceived positive consequence than those without unhealthy alcohol use (Fig. 1). Among persons who self-reported unhealthy alcohol use, 59 to 82% reported at least sometimes experiencing the specific perceived positive consequence, compared to 25 to 47% of persons without unhealthy alcohol use. Of the perceived positive consequences,“I felt at ease when I drank” was most commonly endorsed by all participants, along with “I had more fun” which was equally endorsed by

persons without unhealthy alcohol use. “I felt creative when I drank” was least commonly endorsed by both groups.

Variables associated with positive consequences of drinking

The mean perceived positive consequence score by participant characteristics are shown in Table 2. In the bivariate analyses, higher levels of education (P=0.0477) was statistically associated with lower perceived positive consequence scores. Higher AUDIT-C scores (P<0.0001), negative consequences (P<0.0001), those with thoughts of reducing alcohol use but not yet taking action (P<0.0213), and anxiety (P<0.0167) were significantly associated with higher perceived positive consequence scores. Women and persons with other substance use reported higher perceived positive consequence scores, but the differences were not statistically significant. Age, race/ethnicity, and depression were not significantly associated with perceived positive consequences of drinking (Table 2).

In the multiple linear regression model, higher AUDIT-C scores and negative consequences of drinking were each independently associated with higher perceived positive consequence scores (Table 3). Gender, education, thoughts on reducing alcohol use, other drug use, and anxiety were not associated with perceived positive consequences (Table 3). With each one-point increase in AUDIT-C score, perceived positive consequence scores increased by 0.8 points (P<0.0001).

DISCUSSION

Despite increased vulnerability for negative outcomes, alcohol use among PLWH remains prevalent.[1] As such, elucidating factors for and correlates of unhealthy alcohol use is critical to help improve currently existing alcohol reduction interventions. Among PLWH, perceived positive consequences of drinking appear to be an important factor related to unhealthy alcohol use. The current study sought to identify the frequency of specific perceived positive consequences of drinking among PLWH and to examine factors associated with greater perceived positive consequence scores. In the current sample, each individual perceived positive consequence was more commonly experienced at least sometimes among PLWH who self-reported unhealthy alcohol use, compared to those without unhealthy alcohol use. Similarly, increased positive consequence scores were related to increased reporting of negative consequences of drinking.

Identifying correlates of unhealthy alcohol use is critical for a population of PLWH, who are more vulnerable to the biological and behavioral harms of alcohol.[18] PLWH are more susceptible to the harmful effects of alcohol use compared to persons without HIV.[1] PLWH may experience increased comorbidities and mortality at lower levels of alcohol use than persons without HIV, due to differences in alcohol metabolism.[1,18] Alcohol use, especially unhealthy use, contributes greatly to liver disease, which is the most common nonAIDS related cause of death among PLWH.[29–31] Unhealthy alcohol use also has a substantial negative impact on HIV-related health outcomes, including progression to severe disease (ie, AIDS), decreased ART adherence, decreased rates of HIV viral suppression, and increased HIV transmission.[2,7,8,18,32–34]

The current findings relating unhealthy alcohol use and perceived positive consequences are consistent with previous research examining populations of college students and treatment-seeking veterans.[13,14,16,17] Given the similarities of these results across different populations, it is possible that perceived positive consequences of drinking may also relate to unhealthy alcohol use among persons with other chronic diseases. This may provide insight on why people who drink at unhealthy levels do so and provide opportunities to intervene more effectively, with an emphasis on understanding both positive and negative consequences of drinking.

An intervention that focuses on both positive and negative consequences of alcohol use, such as motivational interviewing, may be effective in reducing alcohol use among this population. Motivational interviewing has been found to be an effective intervention that can both reduce alcohol use and improve adherence to HIV medications.[35] Most behavioral alcohol reduction interventions among PLWH, however, thus far have had limited or time-attenuated effects. For example, Brown and colleagues conducted a review of 14 behavioral interventions to reduce alcohol use among PLWH and found that while there was some support for reducing alcohol frequency and quantity compared to control conditions, there was minimal efficacy for reducing heavy drinking or abuse/dependence symptoms.[11] Further, the authors emphasized the need to identify which specific intervention components work best to reduce alcohol use among PLWH, as well as relevant mediators and moderators of treatment efficacy. Given research indicating that PLWH receive more hedonic alcohol effects[19] plus prior work linking positive consequences to unhealthy drinking among college students and treatment seeking veterans,[13–17] positive consequences may be a relevant intervention target to reduce unhealthy alcohol use among PLWH. Clinicians may also consider asking their patients about the positive experiences that persons have with alcohol use, as these may provide some insight at identifying persons at-risk for unhealthy drinking.

Thoughts on reducing alcohol use were unrelated to perceived positive consequences of drinking, indicating that perceived positive consequences of drinking may not influence readiness to reduce drinking. However, considering the decisional balance of positive and negative consequences of drinking is an important component of certain counseling techniques such as motivational interviewing.[36]

Although anxiety was not statistically significant, persons with more anxiety symptoms tended to have perceived more positive consequences from drinking. As previously mentioned, past findings have linked AUD and anxiety disorders.[37] Drinking to relieve anxiety symptoms has been suggested to put individuals at greater risk for developing AUD.[38] Some of the perceived positive consequences studied included items that may be linked to reducing anxiety, like feeling “at ease”. Therefore, persons seeking to reduce their drinking may need other strategies or treatments to help address anxiety symptoms.

This study has several limitations. Because the data analyzed in the current study was cross-sectional, it is impossible to establish temporality between the predictors and outcome, so it is unclear whether unhealthy alcohol use precedes more perceived positive consequences or vice versa. Further, all data from the current study came from a self-reported survey, which may be subject to misclassification. Additionally, self-reports of alcohol consumption are

often underreported due to social-desirability bias,[39] thus it is possible that our sample included more persons with unhealthy alcohol use than our data represent. However, eligibility for the study was not based on drinking status or other drinking criteria, which reduces the likelihood that participants provided inaccurate drinking data to be enrolled into the study. The current study used data from the Florida Cohort follow-up, which only had a 61% completion rate due to limited resources, although participant demographics in the follow-up were similar to that of the total study population.[22] It is important to note that the measure of positive consequences examined perceived positive consequences at the personal level (eg, feeling at ease after drinking), and did not consider other salient external positive consequences like the effects of alcohol on aspects of social bonding and group formation.[40] It is also unclear what positive consequence score is meaningful, as there have been no validated cut-points, to date. Relatedly, consequences of alcohol use are subjective and may be prone to interpersonal variability.[41] Importantly, prior research has also found that retrospective reports of drinking consequences may be influenced by alcohol expectancies,[42] which were not assessed in the present study. We also chose not to examine how similar characteristics are associated with negative consequences of drinking due wanting to address the more novel topic of positive consequences, in which very little work has been completed. However, our team is currently working on a negative consequences of drinking manuscript from the full Florida Cohort study (n=932). Future studies relating perceived positive consequences to drinking outcome would benefit by measuring positive and negative alcohol expectancies.

This study has many strengths. This study included PLWH from 9 locations in Florida, which has one of the largest HIV burdens in the United States.[43,44] Knowing more about alcohol use in PLWH in Florida may be helpful for designing alcohol reduction interventions that take the unique needs of this population into account. The Florida Cohort study was designed to be representative of HIV in the state of Florida, thus we believe that these results are generalizable on a state-level as the demographics of this study are very similar to the demographics of PLWH in the state. Lastly, we used valid and reliable scales to measure alcohol consequences,[23] alcohol consumption,[25] and mental health conditions.[26,27]

CONCLUSIONS

To our knowledge, this was the first study to examine the frequency and predictors of perceived positive consequences of drinking among PLWH. Perceived positive consequences of drinking were associated with unhealthy alcohol use and increased negative consequences of drinking. This study furthers the notion that a decisional balance between both positive and negative consequences of drinking is necessary when planning interventions. Future studies should examine how perceived positive consequences and drinking are related longitudinally and consider using daily measurements such as Ecological Momentary Assessment to understand the temporality of these associations.

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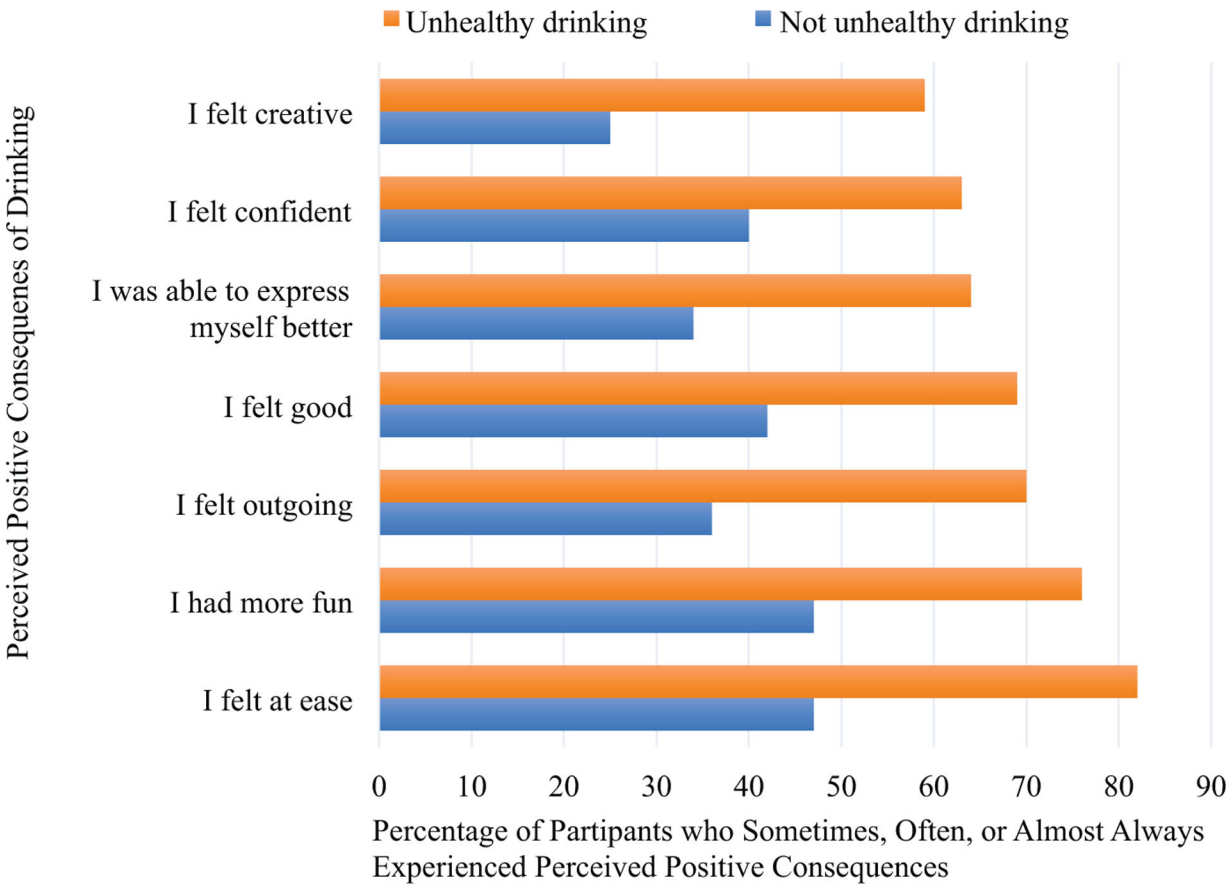

Fig. 1.

Proportion of PLWH who drank in the past 6 months with specific perceived positive consequences when they drink alcohol (n=303). Unhealthy alcohol use was defined as an AUDIT-C score ≥3 or ≥4 for women and men, respectively. A significantly larger proportion of PLWH with unhealthy alcohol use sometimes, often, or almost always experienced each perceived positive consequence more often than PLWH without unhealthy alcohol use.

Table 1:

PROMIS[1] Questions for Assessing Alcohol-Related Consequences

Positive consequences
I was better able to express myself when I drank
I felt at ease when I drank
I felt good about myself when I drank
I felt creative when I drank
I felt outgoing when I drank
I felt confident when I drank
I had more fun when I drank
Negative consequences
I was unreliable when I drank
Others complained about my drinking
Drinking creating problems between me and others
I said or did embarrassing things when I drank
I disappointed others when I drank
I used poor judgement when I drank
I had trouble getting things done after I drank

[1]PROMIS, Patient-Reported Outcomes Measurement Information System.

Table 2:

Demographics and Baseline Characteristics of Sample in Relation to Perceived Positive Consequence Scores Among Persons Living with HIV and Who Drank Alcohol in the Past 6 Months (n=328)

	Frequency (%)	Mean Perceived Positive Consequence Score (SD)	Unadjusted *P* value[1]
Age			0.3539
18–34	59 (18.2)	19.9 (7.4)	
35–44	60 (18.5)	16.5 (7.0)	
45–54	129 (39.8)	16.4 (6.7)	
55+	76 (23.5)	14.9 (6.8)	
Sex			0.0828
Female	97 (31)	16.6 (7.9)	
Male	216 (69)	15.9 (6.5)	
Race/ethnicity			0.1563
Hispanic	69 (22.3)	16.2 (7.3)	
NonHispanic, Black	181 (58.4)	16.2 (7.1)	
NonHispanic, White	60 (19.4)	15.7 (6.6)	
Education			0.0477
Less than high school	101 (31.2)	17.5 (6.9)	
High school graduate or equivalent	98 (30.2)	15.7 (7.0)	
At least some college	125 (38.6)	15.4 (6.9)	
Negative consequences[2]			<0.0001
Low	116 (35.4)	12.5 (7.0)	
Medium	95 (29.0)	16.3 (6.0)	
High	117 (35.7)	19.6 (5.6)	
Thoughts on reducing alcohol use			0.0213
Cutting back	136 (42.9)	16.6 (6.9)	
Thinking about it	43 (13.6)	18.4 (6.3)	
Not thinking about it	138 (43.5)	15.4 (6.9)	
Past 6 month substance use			0.0680
No	187 (63)	15.6 (7.2)	
Yes	110 (37)	16.9 (6.6)	

	Frequency (%)	Mean Perceived Positive Consequence Score (SD)	Unadjusted *P* value[1]
Depression[3]			0.1491
No	214 (67.5)	15.8 (6.8)	
Yes	103 (32.5)	16.9 (7.2)	
Anxiety[4]			0.0167
No	217 (69.3)	15.4 (6.5)	
Yes	96 (30.7)	17.6 (7.6)	
Mean AUDIT-C score (SD)	5.1 (2.7)	16.1 (6.9)	<0.0001

[1] *P* values are from Kruskal-Wallis tests for all categorical variables.

[2] Negative consequences based off of negative consequence total score tertiles; low ≤7; medium >7 and ≤12; high >12.

[3] Participants are considered to have depression if their total PHQ-8 score ≥10.

[4] Participants are considered to have anxiety if their total GAD-7 score ≥10.

Table 3:

Linear Regression Analysis Examining Perceived Positive Consequences of Drinking as the Primary Outcome Among Persons Living with HIV Who Drank Alcohol in the Past 6 Months (n=256)

	Unadjusted β[1] (SE)	Adjusted β[2] (SE)	Adjusted 95% Confidence Interval	Adjusted *P* value
Gender	0.7 (.9)	1.2 (0.9)	(−0.6, 2.9)	0.1868
Education	−1.0 (0.5)	0.4 (0.5)	(−0.6, 1.4)	0.4419
AUDIT-C score	1.1 (0.1)	0.8 (0.2)	(0.5, 1.1)	<0.0001
Negative consequences[3]	3.5 (0.4)	2.3 (0.5)	(1.3, 3.4)	<0.0001
Thoughts on reducing alcohol use	−0.3 (0.6)	−0.7 (0.6)	(−1.8,0.4)	0.2076
Past 6-month substance use	1.3 (0.8)	−0.3 (0.8)	(−2.0, 1.3)	0.6779
Anxiety[4]	2.2 (0.8)	1.7 (0.9)	(−0.1, 3.5)	0.0674

[1]Unadjusted values come from a simple linear regression model including only one independent variable and perceived positive consequence score.

[2]Adjusted values come from a multiple linear regression model including gender, education, AUDIT-C scores, thoughts on reducing alcohol use, other drug use, and anxiety.

[3]Negative consequences based off of negative consequence total score tertiles; low ≤7; medium >7 and ≤12; high >12.

[4]Participants considered to have anxiety if their total GAD-7 score ≥10.

SE, standard error.