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Heavy-Drinking Smokers' Treatment Needs and Preferences: A Mixed-Methods Study

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Abstract

The purpose of this mixed methods study was to describe the smoking and psychological characteristics of heavy-drinking smokers, their perceptions of smoking and drinking, and their smoking and alcohol treatment preferences to inform an integrated smoking and alcohol intervention. Heavy-drinking smokers (N = 26) completed standardized surveys and participated in semi-structured focus group interviews. Participants reported a strong association between their smoking and drinking. Participants were more motivated to quit smoking than to reduce their drinking but perceived greater barriers to smoking cessation. Stress/negative affect was closely linked with both behaviors. They expressed overall enthusiasm for a smoking and alcohol intervention but had specific format and content preferences. Half preferred an integrated treatment format whereas others preferred a sequential treatment model. The most preferred content included personalized health feedback and a way to monitor health gains after behavior changes.

Keywords

cigarette smoking; heavy drinking; smoking cessation; treatment; qualitative research

1. Introduction

Cigarette smoking rates are elevated among individuals who report heavy alcohol consumption. More than 50% of individuals who report drinking (defined as >14 drinks per week/5 per day for men and >7 drinks per week/4 per day for women (SAMSHA, 2006) smoke cigarettes compared with 23-39% of individuals who either abstain from alcohol or drink only moderately (Dawson, 2000; Falk, Yi, Hiller-Sturmhöfel, 2006). Cigarette

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Conflict of interest

All other authors report no conflicts of interest.

smoking is the leading preventable cause of morbidity and mortality in the United States (U.S. Department of Health and Human Services, 2014) and when combined with heavy alcohol has a synergistic effect on health including increased risk of liver, head, and neck cancers, liver cirrhosis, pancreatitis (Kuper et al., 2000; Lowenfels et al., 1994; Vaillant, Schnurr, Baron, Gerber, 1991; Znaor et al., 2003), and abnormalities in brain structure and function (Durazzo, Cardenas, Studholme, Weiner, Meyerhoff, 2007).

Combined heavy alcohol use and cigarette smoking is also associated with poor treatment outcomes. Heavy-drinking smokers are less likely to initiate a smoking quit attempt (Cook, Fucito, Piasecki, Piper, Schlam, Berg, Baker, 2012; Osler, Prescott, Godtfredsen, Hein, Schnohr, 1999; Zimmerman, Warheit, Ulbrich, Auth, 1990), achieve and maintain smoking abstinence (Cook et al., 2012; Dawson, 2000; Hughes & Kalman, 2006; Kahler, Borland, Hyland, McKee, Thompson, Cummings, 2009; Leeman et al., 2008), and successfully moderate or abstain from alcohol use (Baltieri, Daró, Ribeiro, Andrade, 2009; Fucito, Park, Gulliver, Mattson, Gueorguieva, O'Malley, 2012). Thus, more effective treatments for concurrently reducing smoking and heavy drinking are warranted.

Several factors may limit treatment response in heavy-drinking smokers. Heavy alcohol use may enhance smoking motivation and smoking may promote motivation to drink (Barrett, Campbell, Roach, Stewart, Darredeau, 2013; Carter & Tiffany, 1999; Cooney, Cooney, Pilkey, Kranzler, Oncken, 2003; Gulliver et al., 1995; King & Epstein, 2005; Lê, Corrigan, Harding, Juzytsch, Li, 2000; McKee, Krishnan-Sarin, Shi, Mase, & O'Malley, 2006; Rohsenow et al., 1997). Heavy drinking may disinhibit individuals to smoke (Drobes, 2002) or potentiate the rewarding effects of nicotine (Harrison, Hinson, & McKee, 2009; McKee, Hinson, Rounsaville, Petrelli, 2004; King, McNamara, Conrad, Cao, 2009; Piasecki, McCarthy, Fiore, & Baker, 2008; Rose, Brauer, Behm, Cramblett, Calkins, Lawhon, 2004). Similarly, cigarette smoking may enhance alcohol reinforcement by reducing the sedating effects and cognitive deficits associated with alcohol use thereby enabling drinkers to consume heavier amounts of alcohol (Drobes, 2002). Therefore, treating one behavior in isolation of the other may render heavy drinking smokers' efforts to change either behavior less successful.

Despite these risks, smoking cessation treatment is not typically provided concurrently with treatment for co-occurring substance use, psychiatric, or medical disorders (Fiore et al., 2008; Hall & Prochaska, 2009). Moreover, effective integrated interventions for smokers with common co-morbidities are understudied. With regard to heavy drinking, there is concern that smoking cessation will negatively affect drinking outcomes (Gulliver, Kamholz, Helstrom, 2006) and misperceptions that smoking is less harmful than heavy drinking. On the contrary, more heavy drinkers will die from smoking-related causes than alcohol-related causes (Prochaska, 2010), quitting smoking does not jeopardize and may even promote drinking changes (Cooney et al., 2015; Prochaska, Delucchi, & Hall, 2004), and many heavy drinkers are motivated to quit smoking (Gulliver, Kamholz, Helstrom, 2006).

Prior studies have investigated smoking interventions provided during or shortly following outpatient or inpatient alcohol treatment (Kalman, Kim, DiGirolamo, Smelson, Ziedonis,

2010; Prochaska, Delucchi, Hall, 2004). Most interventions were brief (i.e., a few sessions), provided concurrent to but not integrated with alcohol treatment, and associated with low smoking quit rates (Kalman, Kim, DiGirolamo, Smelson, Ziedonis, 2010; Prochaska, Delucchi, Hall, 2004). Adding smoking pharmacotherapy to these interventions yielded higher smoking quit rates, but quit rates were still low and not sustained beyond treatment (Cooney et al., 2015; Kalman, Kim, DiGirolamo, Smelson, Ziedonis, 2010; Prochaska, Delucchi, Hall, 2004). Two studies have examined a brief alcohol intervention integrated into smoking cessation treatment for heavy-drinking smokers seeking to quit smoking (Kahler et al., 2008; Toll et al., 2014). Heavy-drinking smokers, not currently alcohol dependent, received 8 weeks of nicotine patch therapy starting on the quit day and either 4 weeks of standard smoking counseling or standard smoking counseling plus brief alcohol advice starting two weeks before quitting. The integrated treatment resulted in greater smoking abstinence and alcohol use reductions but these effects were modest; smoking changes also did not persist beyond treatment and were greatest among only moderately heavy-drinking smokers. Another study tested the provision of a brief alcohol intervention to heavy-drinking smokers contacting a state smokers' quitline (Toll et al., 2014). Adding alcohol-related content to a single smoking cessation phone session increased smoking quit rates compared to standard care seven months after treatment completion. In addition, the integrated intervention group reported fewer heavy drinking days at the 7-month follow-up than the standard care group but the difference was not significant ($p = .07$).

Despite these limitations, integrated treatment is a promising model for addressing smoking and heavy drinking and highlights how smoking treatment can provide an opportunity to identify and intervene with individuals who report heavy drinking. Providing a more intensive intervention before and after quitting smoking and incorporating skill development relevant for changing alcohol use might promote sustained smoking abstinence and greater drinking reductions in this population.

The purpose of this mixed methods study was to understand heavy-drinking smokers' smoking and drinking behaviors and their reactions to a proposed integrated smoking and alcohol treatment program to inform intervention development. The aims were threefold: (1) to describe the self-reported smoking, drinking, and psychological characteristics of heavy-drinking smokers, (2) to characterize heavy drinking smokers' perceptions of smoking and the association between smoking and alcohol use, and (3) to describe heavy drinking smokers' smoking and alcohol treatment preferences.

2. Material and methods

2.1 Design

A mixed-methods descriptive design was used (quantitative + qualitative) (Creswell & Plano Clark, 2011). Participants were 26 heavy drinking smokers who reported an interest in quitting smoking. Participants completed standardized surveys and participated in semi-structured focus group interviews. Data were collected and analyzed for each qualitative and quantitative strand individually and then integrated in the discussion.

2.2 Study sample

Heavy-drinking smokers were recruited between May and December of 2013 from the local community primarily through advertisements on Facebook and Craigslist and flyers posted on public noticeboards. Advertisements targeted smokers who drink alcohol and stated that the purpose of the study was to conduct interviews with them to better understand the association between smoking and drinking and to assess their smoking cessation and alcohol treatment preferences. Inclusion and exclusion criteria were based on eligibility criteria for a larger clinical trial of pharmacotherapy plus counseling for heavy-drinking smokers. To be eligible, participants had to be at least 18 years of age and report the following: (1) smoking 5 cigarettes/day on average for 1 year and have an expired breath carbon monoxide level of >4 ppm (participants did not have to report daily smoking), (2) interest in quitting smoking, and (3) exceed NIAAA heavy drinking criteria (i.e., for men, >14 drinks/week or 5 drinks/day at least once per month over the past 12 months; for women, >7 drinks/week or >4 drinks/day at least once per month over the past 12 months). Participants were excluded for the following: (1) clinically severe alcohol dependence in the past 12 months defined by seizures, delirium, or hallucinations during withdrawal or a Clinical Institute Withdrawal Assessment Scale (Sullivan, Sykora, Schneiderman, Naranjo, & Sellers, 1989) score of > 8; (2) current enrollment in alcohol or smoking cessation treatment; (3) current substance dependence other than nicotine, (4) current psychosis, suicidality, cognitive impairment; (5) report new onset of psychiatric disorders or new psychotropic medications within the past 3 months; (6) currently pregnant or nursing.

2.3 Procedures

Interested volunteers who clicked on web-based advertisements or contacted study staff were first directed to the study website to complete a web-based pre-screener that took approximately 5 minutes. Individuals who met initial eligibility were then invited to participate in an in-person intake appointment of approximately 90 minutes to verify final eligibility and assess demographic information and smoking, drinking, and psychosocial characteristics. Eligible participants participated in 1 of 8 focus group interview sessions that took place immediately following or up to 7 weeks after intake. Focus group sessions were composed of 2-6 participants who were interviewed as a group; one participant who was unable to attend any group session completed an individual interview. In interview sessions, each participant was asked to provide his/her opinion at the end of a given discussion topic by raising his/her hand in agreement so that we could get an estimated count of heavy drinkers' perceptions and treatment preferences. At the beginning of each interview session, participants were informed that a primary goal of the study was to evaluate their reactions to an integrated program to help people "quit smoking and reduce drinking"

2.4 Quantitative measures

At intake, two interviews were conducted: (1) the Timeline Followback Interview (TLFB) (Sobell & Sobell, 2003) assessed quantity and frequency of smoking and alcohol use for a 90-day period prior to study enrollment, and (2) the Structured Clinical Interview (SCID) (First, Spitzer, Gibbon, & Williams, 1996) determined current and lifetime diagnoses of

DSM-IV substance use and specific Axis I psychiatric disorders (i.e., alcohol, drug, panic disorder, psychosis, and mood disorders).

All other measures were computer-based. Participants completed demographic and smoking history questionnaires that were designed for this study. Nicotine dependence was measured by the six-item Fagerström Test for Nicotine Dependence (Heatherton, Kozlowski, Frecker, Fagerström, 1991). The 14-item Obsessive Compulsive Drinking Scale (OCDS), assessed thoughts about drinking, urges to drink, and the ability to resist these thoughts and urges (Anton, 2000). A 5-item version of the Questionnaire on Smoking Urges-Brief (Toll, Katulak, McKee, 2006) was used to measure the structure and function of cravings to smoke cigarettes. The scale has two factors and characterizes urge to smoke in response to: (1) desire and intention to smoke and (2) relief from nicotine withdrawal or negative affect. The Contemplation Ladder (Biener & Abrams, 1991), a single item measure of stage of behavior change (i.e., precontemplation, contemplation, preparation, action, maintenance) assessed motivation to quit smoking and reduce alcohol consumption. Participants were also asked to indicate their goals for smoking and drinking (e.g., abstinence, controlled use) using a single item from the Thoughts About Abstinence Scale for each behavior (Hall, Havassy, & Wasserman, 1991). The 21-item Depression Anxiety Stress Scale (DAAS-21) assessed negative and emotional states of depression, anxiety, and stress (Lovibond & Lovibond, 1995). DAAS-21 total subscale scores were multiplied by 2 and then compared to suggested clinical cut-off scores. A questionnaire, designed for this study, evaluated participants' prior use of cognitive and behavioral coping strategies to avoid smoking and alcohol cues.

2.5 Qualitative interviews

Interviews were conducted using a semi-structured template and encompassed three domains: (1) perceptions of the connection between smoking and alcohol use; (2) perceptions of barriers to reducing cigarette smoking and alcohol use; (3) smoking cessation and alcohol treatment preferences (see Table 1). We ceased recruitment when interviews yielded no new information about the three domains and there was redundancy in sub-themes.

Two investigators with experience interviewing and providing health interventions to heavy-drinking smokers conducted the interviews (LMF, THH). Interviews lasted approximately 90 minutes and were audiotaped. To protect participants' confidentiality, participants were asked to use a pseudonym during the interview. A transcription service then transcribed audiotaped interviews verbatim; digital interview files were uploaded using a secure, password-protected server.

2.6 Data analysis

Quantitative methods were used to summarize participant self-report data. Pearson correlations were conducted to identify potential associations among smoking, alcohol, and psychological measures. It was hypothesized that greater smoking behavior would be associated with greater drinking behavior. We also anticipated a positive association between both behaviors and measures of negative affect.

Transcribed interviews were analyzed using QSR International's NVivo 10 (QSR, 2012), a qualitative software program that facilitates text coding and comparison across participants. Interview transcripts are uploaded into NVivo and then text components are assigned codes. NVivo assigns codes that are identified by the investigator. Two investigators analyzed interview content (coding team = LMF, THH) along with a research assistant using a constant comparative method in which data was broken down into discrete units and then coded into relevant categories (Sandelowski, 2000). A preliminary thematic coding infrastructure was first derived from the three aforementioned domains of the semi-structured focus group interviews; data for each question was first coded into its relevant domain. For example, a participant's narrative that smoking cessation and alcohol treatment should be integrated was first coded in the "treatment preferences" domain. The coding team reviewed coded transcripts in detail to determine whether the data were initially categorized in the appropriate domain. Data within each domain were then coded, using line-by-line coding of participant's statements. These codes were further specified into secondary themes after multiple readings of the data in which the team investigated sub-topics, opposing opinions, and new insights. The relevance of domains and sub-themes was evaluated using repeated comparative assessment until thematic saturation had been reached (i.e., no further themes could be derived). For example, a participant's narrative that changing only cigarette smoking could cause an increase in alcohol use that could inevitably reduce smoking cessation success was further coded as "integrated treatment preference, substitution concerns." Coding reliability was maintained through initial group review of transcripts and thematic infrastructure development, preliminary roundtable discussions concerning the interpretation and application of themes, and group consensus on coding scheme and working definition of codes and themes.

3. Results

3.1 Participants

Participants were twenty-six men and women from the local, New Haven community. Participants were 38.73 years old on average ($SD = 13.66$) (see Table 2). The majority were male (62%), single (65%), and either Caucasian (42%) or African American (46%). On average, participants reported smoking 11.92 ($SD = 4.74$) cigarettes per day and drinking 7.93 ($SD = 3.84$) drinks per drinking occasion. Three participants reported non-daily smoking. Two smoked on 29 days in the past 30; the third smoked on 23 days. Participants reported an average percentage of 67.78 ($SD=24.66$) drinking days and an average percentage of 50.13 ($SD=27.66$) heavy drinking days. Most participants met current DSM-IV diagnostic criteria for alcohol dependence; all met lifetime criteria for either alcohol dependence ($n = 25$) or alcohol abuse ($n = 1$). Almost half of the sample met lifetime DSM-IV diagnostic criteria for major depressive disorder or panic disorder.

3.2 Qualitative + quantitative results

For each domain (i.e., perceptions of smoking/alcohol interactions, perceived barriers to reducing smoking and alcohol use, smoking cessation and alcohol treatment preferences), participants described several themes that were further divided into subthemes where relevant. Illustrative quotes for each theme are provided below.

Domain 1: Perceptions of Smoking and Alcohol Interactions – Main Themes—

In focus group discussions, most participants perceived a strong association between cigarette smoking and alcohol use. Specifically, most indicated that drinking increases either the frequency and/or quantity of their smoking. Fewer participants reported that cigarette smoking increases alcohol use.

“If I’m at the bar, if I’m drinking, I’m buying cigarettes and if I’m smoking, I’m buying a drink. I mean, I don’t do one without the other.”

“And part of me really says like if I want to make a serious attempt I’d have to at least go a month probably without drinking so I’d get in the habit of just not smoking.”

These qualitative results corresponded with quantitative findings. Greater smoking craving scores were significantly correlated with greater cravings to drink [$r(26) = .46, p = .02$]. Likewise, greater cigarettes smoked per day tended to be associated with greater drinks per drinking day [$r(26) = .37, p = .066$].

Domain 2: Barriers to Reducing Smoking and Drinking – Main Themes

Motivation to change: On average, participants reported greater readiness to change their smoking behavior ($M = 6.65, SD = 2.12$) than their drinking ($M = 4.81, SD = 2.64$). The most common goal endorsed for smoking was abstinence (69%) whereas the most common goal for drinking was moderation (58%). Most participants stated during interviews that they perceived more consequences from smoking than drinking, particularly greater health concerns.

Barriers to change: Though most participants were more motivated to change their smoking, they perceived smoking to be the harder behavior to change. Participants reported many reasons why quitting smoking was more difficult including stronger habit/routine, ability to smoke in many environments compared to drinking, stronger cravings, greater reliance on smoking for managing stress/negative affect, and fewer immediate consequences from smoking than drinking.

“I would say because it’s [smoking] literally every part of my day and it’s so habitual. Where[as] a drink, I don’t drink every day. And when I don’t drink, I don’t feel the same effects as when I don’t have a cigarette.”

“I’m at a point in my life now it just seems like stress is just knocking at the door every other day. So, I couldn’t really focus on being serious about quitting. Constant things [are] coming up. It kind of triggers the smoking.”

The most common perceived barriers to reducing alcohol consumption included lack of self-discipline/commitment, stress/negative affect, and social/environmental factors. For instance, many participants reported being frequently exposed to alcohol in their social environment.

“Every corner you go on, you got a package store.”

“Even in the workforce, every so often during the year, they throw a party. The first thing they throw out is alcohol, so everywhere you go, you can’t avoid [it].”

Qualitative results regarding stress/negative mood were validated by quantitative findings. Greater smoking cravings were associated with higher anxiety scores [QSU-Brief Factor 1: $r(25) = .44, p = .03$; QSU-Brief Factor 2: $r(25) = .51, p = .01$]. Similarly, greater cravings to drink were associated with greater anxiety [$r(25) = .71, p < .001$], stress [$r(25) = .72, p < .001$], and depression scores [$r(25) = .48, p = .02$].

Domain 3: Smoking Cessation and Alcohol Treatment Preferences – Main Themes

Prior behavior change strategies: Most participants (68%; $n = 18$) reported ever trying to quit smoking in their lifetime. A smaller percentage reported trying to quit smoking in the past 12 months (46%; $n = 12$). Among those who ever tried to quit smoking, the majority (81%) relied on no assistance (i.e., “cold turkey” method). Roughly a third (38%; $n = 10$) reported prior use of nicotine replacement for a smoking quit attempt. The reported use of other pharmacological interventions for smoking cessation was as follows: 19% ($n = 5$) varenicline, 4% ($n = 1$) bupropion, and 27% ($n = 7$) e-cigarettes. Most participants reported ever trying to reduce their drinking (81%; $n = 21$) but less than half (42%; $n = 11$) reported ever receiving formal outpatient or inpatient treatment for their alcohol use.

In focus group interviews, participants reported using a number of behavioral strategies to quit smoking including changing routines, oral replacement (e.g., chew gum), staying busy, relying on social support, and making smoking inconvenient. They also utilized behavioral strategies to reduce their drinking such as changing their social environment, limiting how much alcohol they purchase, using controlled drinking strategies (e.g., slow the pace of drinks, make every other drink non-alcoholic), staying busy, and changing their routines.

“I believe that each one of us, if we all kept busy, we would smoke less. If you’re continually doing something, you just don’t think about smoking. But as soon as you stop and got idle time, you start thinking about that cigarette.”

“You can train yourself to be around more people that don’t do what you’re doing. It helps because if you just hang around any and everybody, you’re going to run into the same person that wants to do the same thing.”

Interest: Most participants were open to treatment for both smoking and drinking during interviews but some stated that their overall interest would depend on the specific content and structure of the program.

Preferred structure/format: In focus groups, participants were split in terms of their preference for the timing of treatment. Half of the participants preferred treatment for both smoking and drinking to be concurrent and integrated. Participants who favored integrated treatment stated that both behaviors are triggers for each other and expressed concerns that changing one without changing the other would leave them vulnerable to relapse.

“I don’t believe you can get rid one without getting rid of the other, so I think you have to concentrate on both of them at the same time because if you stop me from drinking and I don’t stop smoking, eventually I’m going to go back to drinking.”

“If you get rid of one, you’re not going to get rid of the other and then you’re going to start the other one, so, you got to stop them both in unison. You can’t do them separate because they’re triggers for one another.”

“I think I could handle doing both or work on doing both with the right support, with the right mindset.”

The other half preferred a sequential treatment approach in which they start with either the most important behavior or the one they feel better about changing. Participants who favored sequential treatment perceived that changing one behavior would have a complimentary effect on the other behavior. Moreover, these participants expressed concerns that an integrated treatment approach would be too much pressure and could increase their sense of failure.

“I think if I stopped drinking or worked on that first I think my cigarette smoking would immediately reduce because my brain is going to be much clearer and I am going to realize that [I] don’t really need to have a cigarette. I think the drinking would be what I would like to target first and I believe it would immediately have an improvement on my cigarette smoking.”

“I [think] you start with the one you know you could quit first. I quit one I might as well quit the next one. If you try to do both you realize that you failing at one even though you are doing [well] with the other one.”

Participants were also split in terms of their preference for individual versus group treatment. Many participants stated that it would be helpful to have both treatment modalities available as options. Some participants expressed concerns that group-based treatment is less private, limits the potential for personalized treatment, and could trigger substance use due to lower commitment/motivation to change among other group members. Other participants perceived group treatment to be helpful by providing greater social support and opportunities to learn behavior change strategies from other individuals in similar situations.

Preferred content: During focus group interviews, personalized health feedback about the effects of smoking and drinking was the most preferred intervention content. Many stated that it would be helpful to receive personalized information about the combined health risks of cigarette smoking and heavy alcohol consumption. Most participants reported that they did not relate to general health promotion campaigns (i.e., television commercials, health posters) focused on other people suffering from the negative effects of smoking but indicated that personalized health information would be motivating.

“You can actually say this is exactly how it’s affecting me, not just the general statistics. And if you see progress in your body that’s going to continue to make you want to continue quitting.”

Most participants preferred content to address the specific reasons why they smoke/drink. Common reasons for smoking/drinking included: (1) social/environmental factors, (2) habit/routine, (3) negative affect/stress management.

“The main thing is finding out why the person is doing it in the first place. I mean because we all have a different reason for why we drink or why we smoke. So, if you can pinpoint a common reason for someone to smoke and drink, then I think that would be a good start.”

Many participants also stated that they would be open to taking medication to address both behaviors.

4. Discussion

The purpose of the study was to understand the smoking, drinking, and psychosocial characteristics of heavy-drinking smokers, their perceptions of smoking/drinking interactions, and their treatment preferences to inform the development of an integrated smoking cessation and alcohol intervention. Participants were predominantly male, single, of a racial/ethnic minority, and had a high school degree or some college education. Most participants reported daily smoking and less than daily alcohol consumption. These characteristics are consistent with data on heavy-drinking smokers from clinical trials and population-based surveys (Cooney et al., 2015; Fucito et al., 2012; Wilson, Weerasekera, Kahler, Borland, & Edwards, 2012). The lifetime prevalence of a mood and/or anxiety disorder was high in this sample. A similar lifetime major depression risk was reported in a prior study of abstinent alcohol dependent individuals being treated for smoking cessation (Covey, Glassman, Stetner, and Becker, 1993).

In line with prior research, both quantitative and qualitative data supported a strong association between smoking and drinking in this sample of heavy-drinking smokers. Specifically, participants perceived that alcohol use increases their motivation to smoke. For this reason, many indicated that they would have to address their alcohol use to successfully quit smoking. This information corresponds to the observed effect of alcohol increasing smoking behavior in laboratory studies (Barrett et al., 2013; Carter & Tiffany, 1999; Cooney et al., 2003; Gulliver et al., 1995; King & Epstein, 2005; Lê et al., 2000; McKee et al., 2006; Rohsenow et al., 1997). Overall, participants were more motivated to change their smoking than drinking. This finding is in contrast to research on patients in alcohol treatment who are typically less motivated to quit smoking (Rohsenow et al. 2014; Flach & Diener, 2004). Among the larger population of heavy drinkers not engaged in/seeking alcohol treatment, smoking cessation interventions may provide an opportunity to address problematic alcohol use (Kahler et al., 2008; Toll et al., 2014). Despite more motivation to quit smoking, most participants perceived greater barriers to smoking cessation. Stress/negative affect was identified as a major barrier and treatment target. A depression history was common in this group and there was an association between participants' negative affect scores and cravings to smoke and drink.

This sample was largely treatment naïve with regard to smoking and drinking. Most quit smoking and/or reduced their drinking in the past without assistance. Some had tried

smoking cessation pharmacotherapies. A common sentiment was that nicotine replacement therapy was not helpful. Common behavioral change strategies focused on habit replacement and stimulus control.

Reactions to a proposed smoking and alcohol intervention were positive overall. Most participants expressed enthusiasm for the intervention. Their overall commitment to the program, however, varied depending on the content and structure of the intervention. Most wanted content to include personalized information about their health profile as well as a way to monitor health gains after making behavior changes. Participants also preferred an intervention that incorporated topics/skill development unique to their reasons for smoking/drinking. Participants indicated that they would be much more interested and committed to the intervention if it included this preferred content and structure. Many participants were open to using a pharmacotherapy that could help with both (i.e., varenicline). With regard to treatment format/structure, there was less consensus among participants. Some preferred an integrated format whereas others preferred a sequential treatment model. Similarly, there were conflicting views of group-based treatment. Despite these differences, most participants indicated that it would be helpful for all treatment formats/structures to be available to individuals.

There is limited research on heavy-drinking smokers' treatment interests and preferences. Prior studies have focused on alcohol dependent smokers in alcohol treatment programs (Ellingstad, Sobell, Sobell, Cleland, Agrawal, 1999), which represent a subgroup of the larger population of heavy-drinking smokers. One study showed similar variability in the temporal preference of changing alcohol and tobacco use (Ellingstad et al., 1999). Specifically, patients with less severe alcohol problems were more willing to work on both behaviors concurrently. Another study with alcohol dependent smokers in residential alcohol treatment found that nearly half had concerns that they needed cigarettes to "cope" and that quitting smoking would jeopardize their alcohol sobriety (Asher, Martin, Rohsenow, MacKinnon, Traficante, & Monti, 2003). In contrast, participants in this study expressed concerns about alcohol use reducing their smoking cessation success. Altogether, treatment interest and preference variability suggests that a more personalized treatment approach may be needed for heavy-drinking smokers, which is consistent with the priorities in medicine to be more patient-centered (Epstein & Street, 2011; Laine & Davidoff, 1996). A patient-centered approach to smoking cessation in this population may also yield higher smoking abstinence rates (Hodgkin et al., 2013). Previous clinical trials of concurrent or integrated smoking and alcohol treatment did not tailor interventions to patients' treatment interests/preferences. The results of this study suggest that tailoring treatment to heavy-drinking smokers' preferences and including more motivational health content and skills training relevant to their specific needs (e.g., managing stress/negative affect, social factors, habit replacement) may result in a more efficacious and acceptable intervention.

Potential study limitations should be noted. We studied a small sample of heavy-drinking smokers in New England whose demographic/clinical characteristics, perceptions of smoking/alcohol interactions, and treatment preferences may not be representative of all heavy-drinking smokers in the United States. The design does not enable us to quantify themes, make predictions about heavy-drinking smokers' behavior relevant to the proposed

intervention, or determine the relative importance of themes by heavy-drinking smokers' clinical characteristics. We chose a primarily qualitative study design in order to describe heavy drinking smokers' experiences and identify key themes that characterize their reactions to the proposed intervention. The quantitative findings should be interpreted with caution given the small sample size.

More comprehensive, integrated smoking and alcohol interventions warrant further investigation. Effective integrated treatments for smokers with common co-morbidities, including problematic alcohol use, remain understudied. Given that most heavy drinkers do not seek alcohol treatment (Witkiewitz, Dearing, & Maisto, 2014), alcohol content may need to be included in other health interventions. Smoking cessation interventions provide an opportunity to address heavy alcohol consumption since heavy drinkers likely need to reduce their drinking to successfully quit smoking. Moreover, reducing both behaviors in this group would have greater benefits on overall health outcomes.

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Highlights

- Heavy-drinking smokers are more motivated to change their smoking than drinking
- Heavy-drinking smokers perceive that drinking increases their smoking
- Many heavy-drinking smokers prefer treatment for both to be integrated
- Heavy-drinking smokers prefer personalized feedback about smoking and drinking health effects

Table 1

Focus Group Interview Excerpts

Domain	Sample Question
Perceptions of the connection between cigarette smoking and alcohol use	“What connection, if any, do you believe there is between cigarette smoking and alcohol use?”
Perceptions of barriers to reducing smoking and alcohol use	“What are the barriers for you to quit smoking and/or reduce your drinking?”
Smoking cessation and alcohol treatment preferences	“We are interested in developing an integrated treatment program to help individuals quit smoking and reduce their drinking. Would you be interested in this program? Would you use the program if it was available to you?”

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Table 2

Participant clinical characteristics (N = 26)

Characteristics	
Age in years, M (SD)	38.73 (13.66)
Male, n (%)	16 (62)
Race	
White, n (%)	11 (42)
Black, n (%)	12 (46)
Asian, n (%)	1 (4)
Native Hawaiian/Other Pacific Islander, n (%)	1 (4)
More than 1 Race, n (%)	1 (4)
Ethnicity	
Hispanic, n (%)	4 (15%)
Marital status, n (%)	
Married or cohabitating	2 (8)
Divorced or separated	5 (19)
Single	17 (65)
Widow/widower	2 (8)
Education, n (%)	
High school graduate/GED	10 (38)
Associate's degree/technical school/some college after high school	13 (50)
College graduate or more	3 (12)
Smoking	
No. cigarettes per day, M (SD)	11.91 (4.74)
Smoke cigarettes daily, n (%)	23 (89)
Menthol smoker, n (%)	17 (68)
Nicotine dependence (FTND) ^a , M (SD)	4.65 (1.60)
Smoking Craving	
QSU-Brief ^b - Factor 1, M (SD)	15.65 (8.07)
QSU-Brief ^b - Factor 2, M (SD)	6.65 (3.95)
Drinking	
Percentage of drinking days, M (SD)	67.78 (24.66)
Percentage of heavy drinking days, M (SD)	50.13 (27.66)
Drinks per drinking day, M (SD)	7.93 (3.84)
Current alcohol dependence, n (%)	14 (54)
Lifetime alcohol dependence, n (%)	25 (96)
Psychosocial	
Depression	
DASS-21 ^c	6.80 (7.51)
Current Major Depressive Disorder, n (%)	3 (12)

Characteristics	
Lifetime Major Depressive Disorder, n (%)	11 (42)
Stress	
DASS-21 ^c	8.48 (7.56)
Anxiety	
DASS-21 ^c	4.72 (5.16)
Current Panic Disorder, n (%)	0
Lifetime Panic Disorder, n (%)	3 (12)

Note.

^aFTND = Fagerström Test for Nicotine Dependence;

^bQSU-Brief = Questionnaire on Smoking Urges. Factor 1 = Strong desire and intention to smoke. Factor 2 = Anticipation of relief from negative affect.

^cDASS-21 – Depression, Anxiety, Stress Scale

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