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Smoking Characteristics and Alcohol Use among Women in Treatment for Alcohol Use Disorder

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Abstract

Background: Understanding the association between smoking and alcohol use among women may help inform the delivery of targeted interventions to address both of these health behaviors.

Methods: This study analyzed data from $N=138$ women enrolled in a randomized clinical trial comparing female-specific individual versus group cognitive-behavior therapy for alcohol use disorder (AUD). We assessed cigarette use patterns, participants' interest in quitting smoking and motivation to quit smoking during treatment for AUD, and examined the relationship between smoking and alcohol use before and during alcohol treatment.

Results: Over a third of the sample reported smoking cigarettes at baseline ($N=47$, 34.1%), with the majority of smokers reporting daily cigarette use. At baseline, those who smoked reported a

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Contributors

Authors EE and BM designed the study and secured research funding. Authors MS and JW advised in protocol development. Authors KB and RR conducted statistical analyses and drafted the manuscript. All authors contributed to and have approved the final manuscript.

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high interest in quitting smoking $M=7.8$ out of 10 ($SD=2.7$), although most believed they should quit smoking only after achieving some success in quitting drinking (50.0%). However, participants who smoked cigarettes (compared to non-smokers) reported more alcohol abuse and dependence symptoms ($p=.001$), lower rates of completing the alcohol treatment ($p=.03$), attended significantly fewer treatment sessions ($p=.008$), and consumed significantly more drinks per day on average both at baseline ($p=.002$) and during the treatment period ($p=.04$).

Conclusions: Findings suggest that women with AUD who also smoke cigarettes have greater difficulty engaging in or responding to treatment for their alcohol use. However, these participants reported high interest in quitting smoking but low perceived readiness during AUD treatment, suggesting that motivational interventions should be considered that could take advantage of the opportunity to treat women for both of these co-occurring behaviors while in treatment.

1 Introduction

Heavy drinking and cigarette smoking co-occur at high rates and are a significant public health concern. Individuals with alcohol use disorder (AUD) smoke cigarettes at rates that are twice as high as the general population (Dawson, 2000; Grant et al., 2015; Weinberger et al., 2019). These two behaviors together pose serious negative health consequences. Cigarette smoking continues to be the leading preventable cause of morbidity and mortality in the United States (USDHHS, 2014), and cigarette smoking combined with heavy alcohol use is associated with increased risk of cancer, liver cirrhosis, pancreatitis, and death (Kuper et al., 2000; Lowenfels et al., 1994; Vaillant, Schnurr, Baron, & Gerber, 1991; Znaor et al., 2003). Given the high rates of co-occurrence and synergistic negative health consequences of these behaviors, integrated treatments for both heavy drinking and cigarette smoking may be critical for improving public health.

Unfortunately, evidence indicates individuals with combined heavy alcohol use and cigarette smoking are at risk for poor treatment outcomes. Individuals who smoke and drink heavily are less likely to succeed at moderating or abstaining from alcohol use (Baltieri, Daró, Ribeiro, & De Andrade, 2008; Fucito et al., 2012) and also are less likely to attempt to quit smoking (Cook et al., 2012; Kahler et al., 2010; Osler, Prescott, Godtfredsen, Hein, & Schnohr, 1999; Zimmerman, Warheit, Ulbrich, & Auth, 1990) or to successfully achieve and maintain smoking abstinence (Cook et al., 2012; Dawson, 2000; Hughes & Kalman, 2006; Kahler et al., 2009; Leeman et al., 2009; Weinberger, Gbedemah, & Goodwin, 2017). Given that many heavy drinkers also smoke cigarettes, and smoking can impact alcohol treatment outcomes, it may be beneficial to address both of these negative health behaviors together in treatment. Several studies have shown that individuals who participate in treatment aimed at addressing alcohol and tobacco use together have more positive outcomes compared to treatments addressing either tobacco or alcohol use alone (Baca & Yahne, 2009; Kahler et al., 2008; Kalman, Kim, DiGirolamo, Smelson, & Ziedonis, 2010; McKelvey, Thrul, & Ramo, 2017). However, the individuals who volunteer to participate in these integrated treatments may be unique in their willingness to address both behaviors simultaneously by nature of the study design and recruitment strategy. Understanding smoking characteristics and general perceptions about quitting smoking among individuals engaged in alcohol

treatment may help inform ways to enhance treatment motivation and efficacy for this population.

While existing research has improved our understanding of the co-occurrence of cigarette smoking and alcohol use, few studies focus on women specifically, yet women are especially vulnerable to negative consequences from these co-occurring behaviors. A study investigating trends in alcohol use among men and women from 2002 to 2012 showed that during this time period, there was an increase in the number of women drinking alcohol (at least one drink per month), the frequency of alcohol use among women, and the prevalence of binge drinking among women, measures on which men either decreased or stayed the same (White et al., 2015). Despite initiating drinking at a later age and drinking less, on average, compared to men, there is evidence that women progress toward problematic alcohol use more quickly (Diehl et al., 2007). Heavy alcohol use among women is also associated with a more rapid onset of other health conditions (e.g., cardiovascular disease, obesity, various cancers; Kay, Taylor, Barthwell, Wichelecki, & Leopold, 2010). Thus, women are not only at increased risk of developing problematic alcohol use but are also more likely to experience greater consequences more quickly. Furthermore, women who drink heavily and also smoke cigarettes are especially vulnerable to negative health consequences (Kay et al., 2010), including smoking-related-death, which has increased among women over the last 50 years (Thun et al., 2013).

Thus, there is a critical need to better understand cigarette smoking and heavy alcohol use specifically among women to address this public health problem. The current study seeks to inform this area of research by describing cigarette use patterns in a sample of alcohol dependent women seeking treatment for alcohol use and examining participants' interest in quitting smoking and motivation to quit smoking during treatment for AUD. Understanding smoking characteristics among women who drink heavily, including their motivation and perceptions about quitting smoking while in treatment for alcohol use, is important for understanding ways to address these co-occurring health behaviors. Additionally, examining the impact of cigarette smoking on alcohol treatment outcomes is important for identifying individuals who may be at risk for poor outcomes, so we also examined the relationship between smoking and alcohol use before and during a 12-session intervention for alcohol use. Consistent with evidence from studies that included both men and women (Baltieri, Daró, Ribeiro, & De Andrade, 2008; Fucito et al., 2012), we hypothesized that women who smoked cigarettes would have poorer alcohol treatment outcomes than non-smokers, measured as heavier alcohol use and poorer treatment retention. Understanding the association between smoking and alcohol use among women may help inform the delivery of targeted interventions to address both of these health behaviors.

2 Materials and Methods

2.1 Participants

The study recruited women via advertisements for alcohol treatment research (e.g., flyers, media, referral outreach) from 2010 to 2014. Eligibility criteria for participation included: being at least 18 years old, consuming alcohol in the past 60 days, meeting DSM-IV-TR criteria for current alcohol abuse or alcohol dependence (American Psychiatric Association,

2000), no current physiological dependence on other drugs (except nicotine, cannabis, and caffeine), no psychotic symptoms in the last 6 months, no gross cognitive deficits (measured by the Mini Mental Status Exam), and no concurrent alcohol treatment (other than AA or self-help).

2.2 Procedure

Interested participants contacted the research team and were screened for initial eligibility over the telephone. Participants were scheduled for an individual screening appointment that included informed consent, an explanation of the research procedures, and a structured clinical interview. Participants provided demographic information and completed self-report questionnaires about their tobacco and alcohol use. Specific measures included in the present analyses are described below. Eligible participants were randomized to 12-weeks of female-specific cognitive behavioral therapy (CBT) for AUD in either individual or group format (see Epstein et al., 2018 for treatment details). Participants returned for weekly visits to complete research assessments and CBT for a total of 12 weeks. End-of-study assessments were conducted 3 months after the start of treatment.

2.3 Measures

2.3.1 Demographics: Participants provided information about their age, race, gender, marital status, employment, and educational history.

2.3.2 Baseline Smoking Characteristics: At the baseline interview prior to starting treatment for AUD, participants provided self-report information about their smoking history. Baseline smoking frequency was measured as “everyday”, “some days”, or “not at all.” Two items from the Fagerström Test for Nicotine Dependence (FTND; Heatherton, Kozolowski, Frecker, & Fagerstrom, 1991) were used to measure daily smoking quantity (i.e., “How many cigarettes do you smoke each day” with response options of “10 or less”, “11 to 20”, “21 to 30”, “31 or more”) and time to first cigarette in the morning (i.e., “How many minutes after you wake up do you smoke your first cigarette” with response options of “within 5 minutes”, “6 to 30 minutes”, “31 to 60 minutes”, “after 60 minutes”). These items were used to derive the Heaviness of Smoking Index (HSI), with total HSI scores corresponding to low (0–1), medium (2–4), and high (5–6) levels of dependence (Heatherton, Kozlowski, Frecker, Rickert, & Robinson, 1989). The HSI is a well-validated measure of nicotine dependence that is predictive of cessation success (Borland, Yong, O’Connor, Hyland, & Thompson, 2010; John et al., 2004; Kozlowski, Porter, Orleans, Pope, & Heatherton, 1993). Use of menthol versus nonmenthol cigarettes was also assessed.

2.3.3 Alcohol Use History and Severity: The Structured Clinical Interview for DSM-IV Disorders (SCID-I) was used to assess the presence of AUD and to quantify the total number of alcohol abuse and dependence symptoms endorsed (First, Spitzer, Gibbon, & Williams, 2002). The timeline follow back (TLFB) interview (Sobell & Sobell, 1992) was used to assess daily quantity and frequency of alcohol use at baseline (i.e., the 90 days prior to the last drink before the intake) and during treatment (i.e., assessed at the 3-month follow-up). Summary alcohol use variables at baseline and during the treatment period were calculated: percent drinking days (PDD; i.e., drinking frequency), mean drinks per drinking

day (MDPDD; i.e., drinking quantity; during the within treatment period, women who were completely abstinent were coded as 0 drinks per drinking day), and percent heavy drinking days (PHDD; a heavy drinking day was defined as 4 or more standard drinks (Greenfield, Pettinati, Malley, Randall, & Randall, 2010)). Within treatment drinking data were available for 96.4% participants.

2.3.4 Motivation and Confidence Quitting Smoking: Participants reported their history of quitting smoking and current plans to quit smoking (response options “yes”/“no”) with separate questions assessing whether they had made a serious quit attempt in the past year, and whether they had plans to quit in the next 30 days and next 6 months. Baseline interest in quitting smoking was measured on a scale of 1 (“not at all”) to 10 (“extremely”). Women indicated how confident they were that they could succeed at quitting smoking if they tried, measured on a 4-point scale: “Not at all”, “A little likely”, “Somewhat likely”, and “Very likely”. An additional item assessed personal beliefs about the best time to quit smoking in relation to alcohol treatment (i.e., “When is the best time to try to stop smoking cigarettes?”) and participants chose one of the following response options: “While I’m trying to quit drinking”, “Only after I have achieved some success in quitting drinking”, “It makes no difference; I have no strong feelings about this”.

2.3.5 Alcohol Treatment Attendance: Treatment completion was assessed by session attendance (i.e., the total number of sessions attended, out of 12 possible sessions), and a binary measure of completer status (“yes”/“no”). The definition of completer status used here is consistent with the primary outcome paper (Epstein et al., 2018); for women in the individual condition, treatment completion was defined as completing all 12 treatment sessions. For women in the group condition, completion was measured as continuing with treatment through the final session. As group dates were not flexible and not able to be rescheduled if missed, some women in the group condition did not attend all 12 sessions but were still considered treatment completers.

2.4 Data Analysis

Analyses were conducted using IBM SPSS version 25 software (IBM, 2017). A modified intent-to-treat sample was used for all analyses, such that analyses included all women who were randomized to a treatment condition and who attended at least one treatment session (N=138), consistent with the primary outcome paper (Epstein et al., 2018). Descriptive statistics were used to characterize baseline demographic variables.

To address the first study aims, descriptive statistics were used to determine prevalence rates of smoking in the sample, compare demographic characteristics of smokers and non-smokers, and describe participants’ motivation and confidence regarding quitting smoking during treatment for AUD. To address the final study aim to examine the relationship between smoking and alcohol use before and during alcohol treatment, we examined differences in baseline alcohol characteristics prior to treatment (e.g., alcohol use quantity/frequency, and number of DSM-IV alcohol abuse and dependence symptoms) and during treatment (quantity/frequency, treatment completion status, number of treatment sessions attended) by smoking status, smoking frequency, and cigarette type (menthol/non-menthol).

Independent samples t-tests were used to compare smokers and non-smokers, daily and non-daily smokers, and menthol cigarette smokers and non-menthol cigarettes smokers on alcohol dependence severity (measured as the number of DSM alcohol abuse and dependence symptoms), alcohol use quantity and frequency, and number of treatment sessions attended. Chi-square analyses were used to examine whether smokers differed from non-smokers in terms of treatment completion status.

3 Results

3.1 Participants

Participants were 138 women ($M=48.7$ years, $SD=11.8$). The majority of participants self-identified as white (87.0%). Women were consuming alcohol on an average of $M=65.5\%$ of days at baseline ($SD=30.5$) and consuming more than 7 drinks per drinking day on average ($SD=4.6$). Table 1 summarizes demographics and baseline drinking characteristics for the sample overall and separately by baseline smoking status.

3.2 Smoking Characteristics

Over a third of the sample reported smoking cigarettes at baseline ($N=47$, 34.1%). Compared to non-smokers, smokers were significantly younger on average (smokers: $M=45.4$, $SD=10.2$, non-smokers: $M=50.3$, $SD=12.2$; $t(136)=-2.40$, $p=.02$), were less likely to be married (smokers: 27.7% vs. non-smokers: 53.8%, $X^2(1, n=138)=8.59$, $p=.003$), or employed either full or part-time (smokers: 42.6% vs. non-smokers: 63.7%, $X^2(1, n=138)=5.66$, $p=.02$), and were less likely to have a bachelor's degree or higher (smokers: 34.0% vs. non-smokers: 52.7%, $X^2(1, n=138)=4.36$, $p=.04$) (Table 1). There were no significant differences in racial distribution by smoking status ($p=.32$). Baseline smoking characteristics are summarized in Table 2. In terms of smoking quantity, more than half of current smokers ($N=24$, 51.0%) reported smoking more than 10 cigarettes each day and 53.2% reported smoking menthol cigarettes ($N=25$).

3.3 Motivation and Confidence Quitting Smoking

Less than half of the sample of current smokers had attempted to quit smoking in the last year ($N=19$, 40.4%). Although this study was recruiting participants for alcohol treatment and not smoking treatment, smokers rated relatively high interest in quitting smoking at baseline $M=7.8$ out of 10 ($SD=2.7$). Almost a quarter of the sample endorsed plans to quit smoking in the next 30 days ($N=11$, 23.4%), and the majority reported seriously considering quitting smoking within the next 6 months ($N=36$, 76.6%). However, very few smokers (8.7%) believed the best time to stop smoking was while also trying to quit drinking. Half (50.0%) of women who smoked stated they believed they should only quit smoking after achieving some success in quitting drinking, while the remaining smokers (41.3%) were ambivalent and had no preference for the timing of quitting smoking (see Figure 1). Additionally, most participants (51.1%) believed they would be very likely to succeed at quitting smoking if they tried (see Figure 2).

3.4 Associations Between Smoking Characteristics and Baseline Alcohol Use

Women who smoked cigarettes had greater baseline alcohol severity, measured as more DSM-IV symptoms of alcohol abuse $t(136)=3.64$, $p<.001$ and dependence $t(119.95)=3.51$, $p=.001$, compared to non-smokers. On average, women who smoked cigarettes were drinking 3 more standard drinks per drinking day at baseline compared to non-smokers, $t(54.75)=3.22$, $p=.002$. Smoking status was not significantly related to percent drinking days or percent heavy drinking days at baseline ($ps>0.11$).

Among those who smoked, frequency of smoking was also related to alcohol abuse severity, such that daily smokers met significantly more alcohol abuse criteria on average ($M=2.9$ $SD=0.9$) compared to non-daily smokers ($M=2.3$ $SD=1.0$), $t(45)=2.08$, $p=.04$. Daily smokers did not differ significantly from non-daily smokers on any other baseline alcohol use variables (mean drinks per drinking day, percent drinking days, percent heavy drinking days, number of alcohol dependence criteria), $ps>.06$. Additionally, women who primarily smoked menthol cigarettes did not differ significantly from those who smoked non-menthol cigarettes on baseline alcohol use variables (mean drinks per drinking day, percent drinking days, percent heavy drinking days, number of alcohol abuse and dependence criteria), $ps>.09$.

3.5 Alcohol Treatment Attendance

Women who smoked cigarettes at baseline were less likely to complete alcohol treatment (55.3%) than non-smokers (73.6%), $X^2(1, n=138)=4.72$, $p=.03$. Women who smoked cigarettes also attended significantly fewer sessions ($M=7.5$, $SD=3.8$) than non-smokers ($M=9.3$, $SD=3.6$), $t(136)=2.678$, $p=.008$. Being a cigarette smoker was an independent predictor of attending fewer alcohol treatment sessions even when alcohol abuse or dependence severity (i.e., number of symptoms of alcohol abuse or dependence) were included as variables in the model ($p<.018$); thus, smoking status seems to be an independent predictor of alcohol treatment completion above and beyond AUD severity.

3.6 Associations Between Smoking and Alcohol Use Treatment Outcomes

We also examined differences in alcohol use outcomes during treatment by smoking status. Smoking status was a significant predictor of change in drinking, such that women who smoked cigarettes made greater reductions in their drinks per drinking day $B=1.64$, $SE=.78$, $t(60.87)=2.10$, $p=.038$, (mean change=4.0 drinks, $SD=5.6$) compared to non-smokers (mean change=2.4 drinks, $SD=3.4$). However, women who smoked cigarettes were drinking more heavily than non-smokers at baseline (as noted above, section 3.4) and continued to drink more heavily during the treatment period (smokers $M=5.4$, $SD=5.2$ vs. non-smokers $M=3.6$, $SD=3.5$, $t(65.27)=2.02$, $p=.047$). Thus, although women who smoked cigarettes appeared to make greater improvements in their drinking quantity during alcohol treatment, this may be due to starting at higher levels, and they continued drinking at significantly higher levels during treatment compared to non-smokers. Adding demographic factors that differed by smoking status (e.g., age, marital status, employment, and education) did not significantly improve the model fit above and beyond smoking status ($F\text{-change}=.21$, $p=.93$), and these demographic variables were not significantly related to the outcome ($ps>.54$), suggesting

that smoking status alone may be an important predictor of heavy drinking that also serves as a proxy measure of risk that may encompass these demographic vulnerability factors.

Smoking status was not significantly related to percent drinking days or percent heavy drinking days within treatment ($ps > 0.84$). Furthermore, smoking frequency (i.e., daily vs. non-daily smoking) was not significantly related to within-treatment alcohol use outcomes (i.e., percent drinking days, mean drinks per drinking day, or percent heavy drinking days) ($ps > .19$). Additionally, there were no significant differences by menthol status in within-treatment drinking outcomes of percent drinking days or percent heavy drinking days ($ps > .71$). Although there were no baseline differences in alcohol use by menthol cigarette status, women who smoked menthol cigarettes consumed significantly more drinks per drinking day during the within-treatment period ($M = 6.9$ drinks per drinking day, $SD = 6.5$) compared to those who smoked non-menthol cigarettes ($M = 3.6$ drinks per drinking day, $SD = 2.8$), $t(30.85) = -2.23$, $p = .03$. Adding demographic factors that differed by smoking status (e.g., age, marital status, employment, and education) did not significantly improve the model fit predicting drinking heaviness above and beyond menthol smoking status (F -change = .86, $p = .50$), and these demographic variables were not significantly related to the outcome ($ps > .14$), suggesting that menthol cigarette preference is an independent predictor of heavier drinking during treatment among smokers.

4 Discussion

The current study examined the relationship between cigarette smoking and alcohol use and alcohol treatment engagement among women with an AUD participating in an outpatient alcohol treatment research program. Findings suggest that women with AUD who also smoked cigarettes had greater difficulty engaging in or responding to the study treatment for their alcohol use, compared to non-smokers. Specifically, women who smoked cigarettes consumed more alcohol at baseline and continued to consume more drinks per drinking day on average than non-smokers during alcohol treatment. Additionally, women with AUD who smoked had greater severity of alcohol abuse and dependence symptoms upon entering alcohol treatment and also attended fewer treatment sessions. Consistent with findings from other studies indicating that smoking status is associated with poor alcohol outcomes independent of baseline alcohol severity (e.g., Abrams et al., 1992), our results indicate that being a cigarette smoker predicted attending fewer alcohol treatment sessions independent of baseline alcohol abuse or dependence severity. Specific smoking characteristics among the subsample of women who smoked (i.e., frequency of cigarette use, menthol cigarette preference) were also significantly related to alcohol use severity at baseline and during treatment. Together, these findings indicate it may be useful for both researchers and clinicians to assess cigarette and other tobacco use in the context of alcohol treatment as it may serve as an indicator of patients with greater severity who are at risk for poor alcohol treatment outcomes. Additionally, given that individuals who drink and smoke are more likely to die from a smoking-related illness than from effects of alcohol (Hurt et al., 1996; Prochaska, 2010), identifying ways to increase treatment engagement and address tobacco use within the context of alcohol treatment could have major impacts on overall health and functioning.

The study findings indicate a high rate of co-occurrence of alcohol use and cigarette smoking among women seeking treatment for alcohol use. Over 34% of the sample with AUD also reported current smoking, which is much higher than the national U.S. prevalence estimates of cigarette smoking (CDC, 2016). However, our findings are consistent with other evidence indicating that tobacco use rates remain high among individuals with other substance use disorders (e.g., Falk, Yi, & Hiller-Sturmhöfel, 2006; Weinberger et al., 2017). These findings add to the literature indicating that co-occurring smoking and alcohol use are associated with poorer treatment outcomes (e.g., Cook et al., 2012; Fucito et al., 2012; Hintz & Mann, 2007; Monti et al., 1995) by demonstrating that similar associations exist among a sample specifically of women seeking treatment for alcohol use. Given evidence about the unique risk for alcohol use problems and health consequences among women (Diehl et al., 2007; Kay et al., 2010), it is important to study this vulnerable population directly to identify ways to optimize treatment engagement and efficacy.

Interestingly, although women in this study were seeking treatment specifically for their alcohol use, the women who also smoked cigarettes reported a high interest in quitting smoking and confidence in their ability to succeed if they tried. However, few believed that they should quit smoking at the same time as they were trying to quit drinking. Given evidence that integrated treatment is likely to improve, rather than hinder, substance use outcomes (Baca & Yahne, 2009; Kahler et al., 2008; Kalman et al., 2010; McKelvey et al., 2017), it may be important to integrate psychoeducation around co-occurring tobacco and alcohol use to correct concerns about stopping use of both substances. For example, psychoeducation could provide information about the role of tobacco and alcohol use in relapse for either substance and encourage change in both behaviors simultaneously to support success. Other research indicates that smoking status may identify individuals who are more reactive (e.g., heightened urge, anxiety) to alcohol high-risk situations, independent of baseline alcohol use or dependence (Abrams et al., 1992), so the coping skills and insights attained during treatment of one behavior may be beneficial for changing the other (Hintz & Mann, 2007). Furthermore, given the high interest in quitting smoking generally but low perceived readiness specifically during AUD treatment for many individuals, motivational interventions should be considered that could take advantage of the opportunity to treat women for both of these co-occurring behaviors while in treatment. At the same time, over a quarter of the sample reported plans to quit smoking in the next 30 days, which was concurrent with their alcohol treatment, so it is also important to identify optimal ways to support efforts to change both behaviors among these motivated individuals while they are already engaged in treatment. For example, future research could assess the integration of AUD treatment with medications for nicotine dependence, such as varenicline, which has shown to be especially effective for women (McKee, Smith, Kaufman, Mazure, & Weinberger, 2015).

We also found that women with co-occurring alcohol and tobacco use were more likely to drop out of treatment or attend fewer treatment sessions than their non-smoking peers. Given that tobacco use has been shown to increase risk of relapse among those with AUD (Weinberger, Platt, Jiang, & Goodwin, 2015), continued access to and use of treatment is important. Relatedly, there is evidence of synergistic positive subject effects of alcohol and tobacco use, which may increase risk of co-use and relapse for both behaviors (Piasecki et

al., 2012). As such, there is a need to improve treatment engagement and retention among this population of drinkers who smoke. It is important to note that there also were other demographic differences between women who smoked cigarettes and those who did not (e.g., differences in age, marital status, employment, and education), which may also influence alcohol treatment engagement and is consistent with national data indicating higher rates of cigarette smoking among disadvantaged populations (CDC, 2016; USDHHS, 2016). Identifying barriers to alcohol treatment engagement and retention among women who also smoke cigarettes is critical for optimizing treatment outcomes and improving health equity.

Findings from the current study should be interpreted with study limitations in mind. The sample was comprised of treatment-seeking women who primarily reported their racial identity as white and enrolled in a randomized clinical trial. Findings may not be generalizable to non-treatment seeking women, or men, or samples with differing demographic characteristics. Specifically, this study excluded individuals with current physiological dependence on certain drugs (e.g., cocaine, opiates), so additional research is needed to understand how treatment interest and engagement may differ in these populations. Additionally, alcohol and tobacco use status were self-reported, and not biochemically verified. This study focused on baseline smoking characteristics as predictors of treatment engagement and outcomes to identify individuals at risk for poor treatment outcomes; future research would benefit from examining how changes in smoking and alcohol use over time influence treatment outcomes for this comorbid population to better inform the optimal timing for addressing both behaviors.

4.1 Conclusions

The current study provides further evidence of high rates of co-occurring alcohol and tobacco use among women with AUD who are seeking treatment for alcohol use. Women with AUD who also smoked cigarettes presented with more severe alcohol use symptoms and more difficulty in alcohol treatment engagement. These findings are important because they indicate there is a substantial group of women seeking treatment for alcohol use who will be less likely to benefit from treatment, so identifying ways to better engage this group of high-risk women who drink heavily and also smoke cigarettes is an important public health priority. Importantly, many women endorsed an interest in quitting smoking, suggesting that alcohol treatment may provide an important opportunity to motivate change in both behaviors. Given the many health risks associated with co-use of alcohol and tobacco, there is a need for continued research examining the association between smoking and drinking to better understand how to promote effective change in both behaviors.

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Highlights

- Over 1/3 of women in alcohol treatment were currently smoking cigarettes
- Cigarette smoking was associated with greater alcohol use severity
- Women who smoked cigarettes had lower rates of completing alcohol treatment
- However, many current smokers were motivated to quit smoking
- Findings have implications for treatment of both alcohol and smoking

Figure 1.

Perceived likelihood of success quitting smoking (N=47)

Values indicate the percent of participants among those who currently smoke cigarettes and their responses about how confident they were that they could succeed at quitting smoking if they tried, measured on a 4-point scale: “Not at all”, “A little likely”, “Somewhat likely”, and “Very likely”.

Figure 2.

Perceived best time to quit smoking in relation to quitting drinking (N=46)

Values indicate the percent of participants among those who currently smoke cigarettes and their responses on the perceived best time to quit smoking in relation to alcohol treatment.

Table 1.

Baseline Sample Demographic Characteristics, N (%) or M (SD)

Demographics	Overall (N=138)	Currently smoking (N=47)	Not Currently Smoking (N=91)
Age	46.8 (11.8)	45.4 (10.2)	50.3 (12.2)
Race			
White	120 (87%)	39 (83%)	81 (89%)
Black or African American	12 (8.7%)	5 (10.6%)	7 (7.7%)
More than one race	6 (4.3%)	3 (6.4%)	3 (3.3%)
Marital Status			
Married	62 (44.9%)	13 (27.7%)	49 (53.8%)
Divorced	24 (17.4%)	7 (14.9%)	17 (18.7%)
Single	17 (12.3%)	11 (23.4%)	6 (6.6%)
Committed relationship/Living as married	22 (15.9%)	11 (23.4%)	11 (12.1%)
Widowed	7 (5.1%)	1 (2.1%)	6 (6.6%)
Separated	6 (4.3%)	4 (8.5%)	2 (2.2%)
Employment Status			
Full-time	57 (41.3%)	16 (34%)	41 (45.1%)
Unemployed	34 (24.6%)	19 (40.4%)	15 (16.5%)
Part-time	21 (15.2%)	4 (8.5%)	17 (18.7%)
Retired	8 (5.8%)	0	8 (8.8%)
Homemaker	6 (4.3%)	2 (4.3%)	4 (4.4%)
Student	6 (4.3%)	3 (6.4%)	3 (3.3%)
Disability	5 (3.6%)	3 (6.4%)	2 (2.2%)
Other	1 (0.7%)	0	1 (1.1%)
Highest Degree Earned			
No degree	1 (0.7%)	0	1 (1.1%)
H.S. diploma or G.E.D.	38 (27.5%)	15 (31.9%)	23 (25.3%)
Technical School/Associates	35 (25.4%)	16 (34%)	19 (20.9%)
Bachelors	42 (30.4%)	13 (27.7%)	4 (29 (31.9%)
Graduate school	22 (15.9%)	3 (6.4%)	19 (20.9%)
Baseline Alcohol Use Characteristics^a			
Percent Drinking Days	65.5% (30.5%)	59.73% (31.11%)	68.46% (29.92%)
Mean Drinks per Drinking Days	7.2 (4.6)	9.33 (6.49)	6.15 (2.76)
Percent Heavy Drinking Days	57.4% (31.7%)	56.69% (30.19%)	57.73% (32.66%)
Number of Alcohol Abuse Symptoms	2.3 (1.1)	2.72 (0.97)	2.05 (1.05)
Number of Alcohol Dependence Symptoms	6.3 (0.9)	6.62 (0.68)	6.13 (0.92)

Note:

^a Baseline alcohol use was assessed using the Timeline Follow-Back for the 90 days prior to the last drink before the intake.

Table 2.**Baseline Smoking Characteristics (N=47)**

Baseline Smoking Characteristics	N (%)
Smoking Status	
Everyday	33 (70.2%)
Some Days	14 (29.8%)
Nicotine Dependence on HSI^a	
Low (0–1)	22 (46.8%)
Medium (2–4)	19 (40.4%)
High (5–6)	3 (6.4%)
Average Number Cigarettes Per Day^b	
10 or Fewer Cigarettes	22 (46.8%)
11–20 Cigarettes	17 (36.2%)
21–30 Cigarettes	6 (12.8%)
31 or More Cigarettes	1 (2.1%)
Time to First Cigarette^c	
Within 5 Minutes	9 (19.1%)
6–30 Minutes	11 (23.4%)
31–60 Minutes	6 (12.8%)
After 60 Minutes	19 (40.4%)
Cigarette Type^b	
Non-Menthol	20 (42.6%)
Menthol	25 (53.2%)
Don't Know/Not Sure	1 (2.1%)

Note:

^aData available for N=44. Heaviness of Smoking Index (HSI) was derived from two items measuring nicotine dependence (i.e., cigarettes smoked per day and time to first cigarette in the morning), with total scores corresponding to low (0–1), medium (2–4), and high (5–6) levels of dependence (Heatherton, Kozlowski, Frecker, Rickert, & Robinson, 1989).

^bData available for N=46.

^cData available for N=45.