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Ethnic Differences in Alcohol Treatment Outcomes and the Effect of Concurrent Smoking Cessation Treatment

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Abstract

The Timing of Alcohol and Smoking Cessation (TASC) Study tested the optimal timing of smoking cessation treatment in an alcohol dependent population. Previously reported results suggest that providing concurrent smoking cessation treatment adversely affects alcohol outcomes. The purpose of this analysis was to investigate whether there are ethnic differences in alcohol and tobacco outcomes among a diverse sample of alcohol dependent smokers using data from the TASC trial in which 499 participants were randomized to either concurrent (during alcohol treatment) or delayed (6 months later) smoking intervention. This analysis focused on smokers of Caucasian (n = 381) and African American (n = 78) ethnicity. Alcohol outcomes included 6-months sustained alcohol abstinence rates and time to first use of alcohol post-treatment. Tobacco outcomes included 7-day point prevalence smoking abstinence. Random effects logistic regression analysis was used to investigate intervention group and ethnic differences in the longitudinally assessed alcohol outcomes. Alcohol abstinence outcomes were consistently worse in the concurrent group than the delayed group among Caucasians, but this was not the case for African Americans. No significant ethnic differences were observed in smoking cessation outcomes. Findings from this analysis suggest that concurrent smoking cessation treatment adversely affects alcohol outcomes for Caucasians but not necessarily for African Americans.

Keywords

Ethnicity; African Americans; alcohol; smoking cessation

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1. INTRODUCTION

Cigarette smoking and alcohol use disorders frequently co-occur. Estimates of current cigarette use among adults with alcohol disorders range between 35% and 95%, depending on whether the general population or those seeking alcohol treatment are sampled (Bobo and Husten 2000; Grant et al. 2004; Hughes 1993; Hughes 1995; Lasser et al. 2000; Patten et al. 1996). Adults who smoke and abuse alcohol have higher levels of nicotine dependence and a lower likelihood of smoking cessation (Breslau et al. 1996; Hays et al. 1999; Hughes and Kalman 2006). Further, smokers with alcohol dependence experience more tobacco-related morbidity and mortality than the general population (Hurt et al. 1996).

There has been an ongoing debate in the literature with regard to the best way to treat co-morbid alcohol and tobacco dependence (Hughes 1995). Many alcohol treatment providers believe that smoking cessation treatment should be sequential and delayed until after alcohol treatment is completed (Sees and Clark 1993). However, sequential or delayed smoking cessation treatment is rarely delivered under current systems of care, arguing for the need to deliver smoking cessation concurrently with alcohol treatment. One body of work suggests that concurrent smoking cessation treatment does not adversely affect alcohol outcomes, and perhaps, results in improved alcohol outcomes (Bobo et al. 1996; Bobo et al. 1998; Kalman et al. 2001; Prochaska et al. 2004). However, in suggesting that concurrent smoking cessation treatment adversely affects alcohol treatment outcomes, recent results from the Timing of Alcohol and Smoking (TASC) randomized controlled trial stand in contrast to these findings (Joseph et al. 2004). The TASC trial is the first large randomized controlled trial specifically designed to address the question of the optimal timing of smoking cessation treatment in patients undergoing alcohol dependence treatment.

Tobacco and alcohol use are influenced by psychological, social and cultural characteristics, and, consequently, response to treatment may be different across different populations. However, there is a paucity of research regarding the treatment of alcohol use among African Americans and little knowledge concerning possible ethnic differences in the best format for alcohol and smoking cessation treatment delivery (Jones-Webb 1998). Data from national surveys indicate that African Americans have higher rates of total alcohol abstinence than Caucasians but similar or higher rates of heavy drinking and problematic drinking (Caetano and Clark 1998; Caetano and Kaskutas 1995; Dawson et al. 1995). In addition, irregular, intermittent episodes of heavy drinking have been observed to be a more prevalent drinking pattern among African Americans than Caucasians (Caetano and Clark 1998; Caetano and Kaskutas 1995; Sempos et al. 2003).

Given these differences in alcohol use patterns between African American and Caucasian populations, research examining ethnic differences in treatment effects is critical to gain a more complete understanding of the relationship between tobacco treatment, alcohol treatment, and the outcomes of these treatments. We investigated whether there are ethnic differences in alcohol and tobacco outcomes among a diverse sample of alcohol dependent smokers using data from the TASC trial.

2. METHODS

TASC was a randomized controlled trial conducted at three substance abuse treatment sites in Minneapolis-St. Paul, Minnesota and was approved by the Institutional Review Boards for each site. Detailed descriptions of the study methods have been previously published (Joseph et al. 2003; Joseph et al. 2004). In summary, all of the programs were centered on the Minnesota Model of alcohol treatment and offered a period of intensive, inpatient alcohol dependence treatment followed by a longer period of aftercare (Stinchfield and Owen 1998). Men and women aged 21-75 years who met criteria for alcohol dependence or abuse by the Diagnostic and Statistical Manual of Psychiatric Disorders, 4th Edition (1994) and who smoked more than 5 cigarettes per day for more than one year were eligible to participate. Participants completed at least the first week of alcohol treatment prior to study entry. Participants were randomly assigned to concurrent (during alcohol treatment) or delayed (6 months later) smoking cessation treatment stratifying by alcohol treatment site. The smoking cessation intervention included guideline recommended behavioral and pharmacological treatments (Fiore et al. 1997). With the exception of timing of delivery, the intervention content was identical for the two arms. We performed a secondary analysis of data from the TASC study to assess ethnic differences in alcohol and tobacco outcomes.

2.1. Sample

Among 1943 individuals screened for participation in TASC, 499 eligible smokers were enrolled and randomized to concurrent or delayed smoking intervention. The analyses presented here focus on smokers of non-Hispanic Caucasian (n=381) and non-Hispanic African American (n=78) ethnicity. Participants of all other ethnicities (n=40) were excluded.

2.2. Measures

2.2.1. Baseline Covariates—Ethnicity was defined by standard self-reported descriptive categories used by the Substance Abuse Module of the Diagnostic Interview Schedule (Keating et al. 1992). Participants were asked to self-identify with one of the following racial and ethnic groups: American Indian, Asian Pacific Islander, Black not of Hispanic Origin, Black of Hispanic Origin, White not of Hispanic Origin, White of Hispanic Origin, or Other. Additional individual characteristics collected at baseline included additional demographic characteristics, a detailed smoking history, alcohol and substance use history, and presence of co-morbid mental health conditions. The Fagerström Test for Nicotine Dependence (FTND) was used to assess level of nicotine dependence (Heatherton et al. 1991). Readiness to quit smoking was assessed using the contemplation ladder (Biener and Abrams 1991). Symptom criteria for alcohol dependence were assessed with the Substance Abuse Module of the Diagnostic Interview Schedule (Keating et al. 1992). The Quick Diagnostic Interview Schedule was used to assess for substance abuse and dependence as well as other psychiatric disorders (Marcus et al. 1991). The Alcohol Dependence Scale was used to measure severity of alcohol dependence (Skinner and Horn 1984). The Beck Depression Inventory was used to assess depressive symptoms (Beck et al. 1996).

2.2.2. Outcomes—The primary alcohol outcome examined in these analyses was 6-months sustained alcohol abstinence which was assessed 6, 12 and 18 months after randomization using a Timeline Follow-back method (Sobell and Sobell 1996). In addition, we examined time to the first use of alcohol post-treatment. The smoking outcome examined in the analyses presented here comprised self-reported 7-day point prevalence smoking abstinence. This was assessed 3, 6, 9, 12 and 18 months after study enrollment and randomization.

2.3. Statistical Analysis

2.3.1. Controlling for baseline difference between ethnic groups—To control for baseline differences between the ethnic groups, a single stratification measure was constructed to balance the ethnic groups with respect to the baseline covariates previously described in section 2.2.1 and presented in Table 1. Specifically, we estimated the probability densities of the covariates within the two ethnic groups and then stratified the sample into four strata based on the ratios of these densities (Noorbaloochi and Nelson 2005). These density ratios are analogous to propensity scores, the probabilities of group membership based on the observed covariates (Rosenbaum and Rubin 1984). Propensity theory was developed to provide a simple method with which to balance treatment groups with respect to confounding covariates, and thereby reduce bias due to confounding. The density ratios share these properties. Stratifying on these density ratios is equivalent to stratifying on a propensity score. In sum, inclusion of this single stratification measure in the regression models for the alcohol outcomes (described below) controls for potential confounding due to ethnic differences in the baseline covariates.

2.3.2. Multivariate regression analyses of alcohol outcomes—We used a random effects logistic regression analysis to investigate intervention group and ethnic differences in the longitudinally assessed 6-months sustained alcohol abstinence outcomes. Random effects for time since randomization were incorporated in the regression analysis to model the correlation between measurements made on the same individual. We found no evidence of interactions between time since randomization and either ethnicity or intervention group or between the three of these measures. Given these results we examined potential differences between ethnic groups using a random effects logistic regression model that incorporated effects for ethnicity, randomly assigned treatment group, an interaction between treatment group and ethnicity, time since randomization and the derived single stratification measure (described above).

At least one 6-months sustained alcohol abstinence assessment was missing for 26% of the study sample. To assess potential bias in the analysis, using the observed data, we implemented a multiple imputation based analysis. Within each combination of ethnicity and intervention group and for each separate assessment visit we constructed a predictive logistic regression model for 6-months sustained alcohol abstinence status using the other baseline covariates. These predictive models yielded estimated probabilities of abstinence for all individuals with missing assessments. These estimated probabilities were used to impute missing alcohol abstinence measures and the analysis described above was applied to

this imputed complete data set. We replicated this process 500 times and used standard methods to aggregate results across the replications.

An additional alcohol outcome was the time to first use of alcohol. This outcome was analyzed using a Cox proportional hazards model incorporating the derived stratification measure (described above), ethnicity, treatment group, and their interaction as predictors.

2.3.2. Bivariate analyses of tobacco outcomes—We also conducted bivariate chi-square descriptive comparisons by ethnicity of concurrent vs. delayed smoking cessation treatment on 7-day point prevalence smoking abstinence outcomes and treatment participation rates. These latter comparisons were conducted to explore possible explanations for the observed ethnic differences in alcohol outcomes.

3. RESULTS

3.1. Baseline Characteristics

Characteristics of TASC study participants are presented in Table 1. The average age was 39 years and about two-thirds were men. African American participants were significantly less likely than Caucasians to be currently employed and reported lower levels of education. In terms of smoking history, African Americans and Caucasians reported similar levels of nicotine dependence based on the FTND score (except cigarettes per day were lower for African Americans), readiness to quit smoking and self-efficacy for quitting smoking permanently. About 40% of each ethnic group attempted to quit smoking in the past year. African Americans, however, were significantly less likely than Caucasians to have used pharmacologic treatments to help with quitting smoking (21% vs. 53%, $p < .001$) and to have received smoking cessation counseling (3.9% vs. 11.8% $p = .036$). There were also significant ethnic differences in participants' alcohol and substance use history. Caucasians met more alcohol dependence criteria and had greater severity of alcohol dependence, yet levels of alcohol use were similar. African Americans were more likely to have a concurrent substance abuse disorder with cocaine use the most common additional substance disorder. There were no significant ethnic differences in presence of co-morbid mental health conditions, depressive symptoms or current use of antidepressants.

3.2. Follow-up, Tobacco Treatment Participation, and Tobacco Outcomes by Ethnicity

African Americans had slightly lower follow-up rates than did Caucasians. Among Caucasians, the follow-up rates at 6, 12 and 18 months were 80%, 75% and 80%, respectively for the concurrent smoking cessation treatment group and 89%, 71% and 85%, respectively for the delayed treatment group. Among African Americans, the follow-up rates at 6, 12 and 18 months were 64%, 64% and 72%, respectively for the concurrent treatment group and 81%, 74% and 76%, respectively for the delayed treatment group.

Smoking cessation treatment participation rates were similar, 73% of Caucasians and 68% of African Americans completed at least one intervention visit ($p = 0.32$). Similarly, 69% of Caucasians and 65% of African Americans received NRT ($p = 0.56$) from the study. However, among those participating in smoking treatment, the average number of sessions among Caucasians (5.1, Standard Deviation (SD) = 3.8) was greater than that among

African Americans (3.5, $SD = 2.1$, $p = 0.003$) and the average total counseling time was greater for Caucasians (93 minutes, $SD = 60$) than African Americans (67 minutes, $SD = 29$, $p = 0.003$). Among Caucasians, participants in the concurrent treatment group were more likely to complete one intervention visit and more likely to receive NRT than participants in the delayed treatment group (Table 2). Among African Americans, there were no significant differences in smoking cessation treatment participation or in receipt of NRT between the two treatment groups.

Few participants in either treatment group (less than 7%) received smoking cessation counseling from outside the study. However, a sizeable proportion of participants received NRT from outside the study and rates were higher in the delayed treatment group than the concurrent treatment group (32% vs. 23%, $p = .03$).

No significant ethnic differences were observed in smoking cessation outcomes. For both Caucasians and African Americans (see Table 2), comparisons of smoking abstinence rates between the concurrent and delayed treatment groups in the early phase of the study (3 and 6 months after enrollment) showed significantly higher cessation rates for the concurrent treatment group than for the delayed treatment group but no significant differences thereafter. At 18-months after study enrollment, 7-day point prevalence smoking abstinence rates for the concurrent and delayed treatment groups combined, considering all nonrespondents as continuing smokers, were 14.4% for Caucasians and 10.3% for African Americans ($p = .604$).

3.3. Ethnicity and Alcohol Outcomes

Among African-American participants, the observed 6-months sustained alcohol abstinence rates at 6, 12 and 18 months were 46%, 32% and 40%, respectively and among Caucasians the corresponding abstinence rates were 51%, 40% and 47%. This assumes nonrespondents had resumed alcohol use. These alcohol abstinence rates for African Americans and Caucasians were not significantly different. Comparison of alcohol abstinence rates between the concurrent and delayed treatment groups at the 6 month follow-up allows an uncontaminated examination of the effect of concurrent smoking cessation treatment, relative to no treatment, since the delayed group had not yet received any smoking intervention. Among Caucasians, rates of alcohol abstinence at 6 months in the concurrent treatment group were significantly lower than in the delayed treatment group (see Figure 1). Thereafter, sustained alcohol abstinence rates remained significantly lower in the concurrent treatment group compared to the delayed treatment group. In contrast, among African Americans, there were no significant differences between treatment groups in alcohol abstinence rates at any of the follow-up visits.

In the random effects logistic regression analysis the results for assessing differences between Caucasians and African-Americans in the effect of smoking cessation treatment on alcohol outcomes were inconclusive. We found no significant interaction between treatment and ethnicity, perhaps due to the limited number of African-Americans. However, while not significant, the model estimated greater harm for concurrent than delayed smoking cessation treatment among Caucasian participants but not among African Americans (see Table 3). Among Caucasians, concurrent smoking cessation treatment was associated with an

estimated 1.74 greater adjusted odds of resumption of alcohol use. The results were inconclusive for African American participants because of the smaller sample size, but the point estimate does not indicate that concurrent smoking cessation treatment is harmful. The results from the multiple imputation based analyses were similar.

A main effects regression model, in which the non-significant interaction between treatment and ethnicity is removed, found that ethnicity is not a significant independent predictor of alcohol abstinence (OR of use for African-Americans compared to Caucasians = 0.90, 95% CI 0.55, 1.49, $p = 0.69$). However, the estimated increased risk of concurrent smoking cessation treatment on resuming alcohol use persists (OR of use in the Concurrent Treatment group compared to the Delayed Group = 1.56, 95% CI 1.12, 2.17, $p = 0.01$).

The Cox proportional hazards survival analysis models for time to first use of alcohol found an interaction between ethnicity and treatment group ($p = .022$). This interaction is summarized in the estimated survival curves presented in Figure 2. Among Caucasians, the time to first use of alcohol was significantly shorter in the concurrent smoking cessation treatment group than the delayed treatment group (HR=1.51, $p = .004$). In contrast, among African Americans, the time to first use of alcohol was longer for the concurrent treatment group than the delayed group but this difference was not significant (HR = 0.66, $p = .214$), see Table 3.

4. DISCUSSION

The TASC trial was specifically designed to address the timing of smoking cessation for patients in alcohol treatment. Previously, we reported the bivariate statistics for alcohol abstinence outcomes between the concurrent and delayed treatment groups at 6, 12 and 18 months follow-up (Joseph et al. 2004). The adverse effects of concurrent smoking cessation treatment on alcohol abstinence were statistically significant at 6 and 12 months but not at 18 months. The current analysis extends our previous findings by examining the effect of smoking cessation treatment timing over time (i.e., longitudinal analysis) and across race/ethnicity. In addition, we controlled for potential confounding due to baseline differences in demographics, smoking-related characteristics, alcohol-related characteristics, and co-morbid substance use and mental health disorders.

There was no evidence of significant ethnic differences in the overall use or success of smoking cessation treatment across both concurrent and delayed smoking cessation treatment groups for patients in intensive alcohol treatment. Both African Americans and Caucasians with alcohol dependence or abuse achieved long-term smoking cessation rates that are comparable to previous smoking cessation clinical trials in the general population. These data support recommendations that providing smoking cessation treatment increases smoking cessation rates for smokers with alcohol use disorders (Hughes and Kalman 2006; Hurt and Patten 2003). Although not statistically significant, the overall observed smoking cessation rates in this study were lower for African Americans compared to Caucasians. Previous observational studies indicate lower smoking cessation rates for African Americans (Novotny, Warner, Kendrick & Remington, 1988; Royce, Hymowitz, Corbett, Hartwell, & Orlandi, 1993; Giovino, 2002). Yet, little is known about ethnic differences in smoking

cessation treatment especially as part of a controlled smoking cessation trial. It is critically important that future smoking cessation trials examine outcomes by ethnicity.

The alcohol abstinence rates observed in this study are similar to past clinical trials (Miller, Walters & Bennett, 2001) and ethnicity was not found to be an independent predictor of alcohol abstinence. However, there were different patterns of associations among treatment timing and alcohol outcomes between Caucasians and African Americans. Among Caucasians, concurrent smoking cessation treatment was found to increase risk of resumption of alcohol use over time and reduce time to first use of alcohol following treatment, compared to delayed treatment. Among African Americans, there was no evidence that alcohol outcomes were adversely affected by delivery of concurrent smoking cessation treatment as evaluated by either alcohol measure. Given the differences observed between African-Americans and Caucasians in the relationship between concurrent intervention and treatment outcomes, this issue should be examined further.

Our study findings on the adverse effects of concurrent smoking cessation treatment among Caucasians are consistent with previous studies that suggest it may be particularly difficult for persons early in recovery to quit smoking (Grant et al. 2003; Joseph et al. 1993; Kalman 1998). These findings are also consistent with evidence supporting the coping hypothesis that smoking serves as a resource for individuals in recovery from alcohol use and quitting smoking during early recovery is potentially harmful to maintaining sobriety (Kalman 1998). These findings, however, contrast a recent meta-analysis of 19 randomized controlled trials of smoking cessation interventions for persons in treatment for or recovery from an addiction that found no detrimental effect on substance use outcomes and suggested a possible benefit (Prochaska et al. 2004). For example, Burling et al. (2001) conducted a randomized controlled trial of two multicomponent smoking cessation treatment interventions compared to usual care among 150 participants in residential treatment for drug or alcohol dependence. Continuous smoking abstinence rates were significantly higher for the two smoking cessation treatment groups compared to usual care and no adverse effects on alcohol abstinence outcomes were observed.

However, most of the studies included in the Prochaska et al. (2004) meta-analysis tended to have low quality scores, significant methodological limitations (e.g., small sample sizes, lack of consistent definitions for concurrent and delayed treatment) and except for one small study were not specifically designed to assess the timing of smoking cessation treatment. The only other randomized controlled study designed to compare concurrent vs. delayed treatment was a study of 36 male veterans in a residential alcohol treatment program and outcome data suggested greater rates of relapse to alcohol in the delayed condition than in the concurrent condition (Kalman et al. 2001). Possible explanations for the contrasting findings include the small sample size of the Kalman et al. study and differences in the definition of delayed treatment. In the Kalman et al. (2001) study, delayed treatment was defined as 6 weeks after admission to alcohol treatment (and possibly not sufficiently delayed) while in the TASC study delayed treatment occurred 6 months later.

Although ethnicity was not an independent predictor of alcohol abstinence, our analysis suggests that the effect of concurrent smoking cessation treatment varies by ethnicity. This

suggests that there may be differences in environmental or cultural factors between African Americans and Caucasians that influence tobacco and alcohol abstinence outcomes. For example, it is possible that additional social support received via extra-treatment sources may mitigate the difficulties associated with maintaining alcohol abstinence early in recovery while simultaneously quitting smoking. It has been hypothesized that African Americans may mobilize additional social resources for quitting alcohol use as well as different behavioral change strategies (Tonigan 2003). Indirect evidence in support of this hypothesis are findings from the Project Match alcohol treatment study, in which African Americans, despite having greater pre-treatment characteristics that would predict failure, were found to have equivalent alcohol treatment outcomes relative to Caucasians (Tonigan 2003). In addition, religious affiliation has been found to have a protective effect on drinking problems among African Americans but not Caucasians (Darrow et al. 1992; Herd 1994).

Other potential explanations for the observed differences between Caucasians and African Americans include differences in alcohol dependence severity, nicotine dependence, presence of other substance use disorders and socioeconomic status indicators. However, we controlled for these potential confounders in our analyses and the differences persisted. We also assessed the impact of observed differences in participation in smoking cessation treatment (e.g., completion of at least one intervention visit and receipt of NRT) but when these variables were included in the regression models, there were no changes in our findings.

This study has several limitations. For example, the sampling of participants was not stratified on race/ethnicity, so the sample size for African Americans is limited. Hence, there is less statistical power to detect significant differences for African Americans. Nonetheless, there was no evidence of harm of concurrent smoking cessation treatment on alcohol outcomes, as the direction of the effect suggested a possible benefit. Also, we used self-reported smoking abstinence outcomes in this analysis, but we did conduct biochemical verification (expired carbon monoxide) on a 25% subsample of participants' claiming abstinence and the misreporting rate was only 6.6%. Another limitation is that African Americans had lower rates of follow-up compared to Caucasians and this may lead to non-response bias. To assess potential for non-response bias, we imputed missing sustained alcohol abstinence measures using multiple imputation procedures. The results from the multiple imputation based analyses were similar.

In conclusion, the findings of this analysis extend our previous findings (Joseph et al. 2004) by suggesting that concurrent smoking cessation treatment adversely affects alcohol outcomes mainly for Caucasians. Resources and policies may need to be developed so that sequential smoking cessation treatment programs can be implemented as such programs are not currently available. In addition, as there may be ethnic differences, further studies should evaluate the optimal timing for the delivery of smoking cessation treatment for specific ethnic minority populations. These studies should incorporate sampling and recruitment plans that will ensure adequate numbers of ethnic minority participants (e.g., stratification on race/ethnicity and recruitment through organizations that serve ethnic minority populations).

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Figure 1. 6-Months Sustained Alcohol Abstinence Rates: Concurrent vs. Delayed for African Americans and Caucasians

Figure 2. Time to First Use of Alcohol by Ethnicity and Treatment Group

Adjusted for stratification measure, a single dimension score which controls for age, gender, employment status, education level, marital status, smoking duration, number of past smoking cessation attempts, level of nicotine dependence, self-efficacy for quitting smoking, number of alcohol dependence criteria, severity of alcohol use, number of past alcohol use cessation attempts, number of coexisting substance use disorders, and Beck depression score.

Table 1
Baseline Characteristics by Ethnicity (N = 459)*

	Caucasian (n = 381)	African American (n = 78)	P-value
Demographics			
Age (years)	39.5 ± 10.7	39.3 ± 8.1	0.848
Gender (male)	70.1%	68.0%	0.709
Married	24.2%	19.2%	0.516
Currently employed	54.3%	39.7%	0.019
Education – HS or less	35.1%	48.7%	0.005
Smoking History			
Cigarettes per day	26.4 ± 11.4	22.0 ± 13.9	0.003
FTND score (range 0-10)	6.1 ± 2.3	5.7 ± 2.1	0.112
Number past quit attempts	3.1 ± 2.1	2.5 ± 2.2	0.033
Contemplation Ladder (mean) (0=no thought of quitting, 10=taking action to quit)	8.3 ± 2.0	7.9 ± 2.6	0.095
Self Efficacy (confidence in quitting smoking permanently)	2.2 ± 1.8	1.8 ± 1.9	0.134
Quit attempt in past year	37.5%	42.3%	0.429
Tried NRT/bupropion in the past	52.8%	20.5%	<0.001
Received prior smoking cessation counseling	11.8%	3.9%	0.036
Alcohol History			
Number of dependence criteria (SAM-DIS)	5.3 ± 1.1	4.8 ± 1.5	0.003
Severity of alcohol use (ADS)	20.1 ± 8.1	17.1 ± 9.8	0.004
Duration of alcohol use (years)	20.7 ± 10.2	21.6 ± 8.9	0.489
Episodes of past inpatient alcohol treatment	1.8 ± 3.0	2.4 ± 4.0	0.190
Proportion days drinking	0.53 ± 0.32	0.55 ± 0.33	0.657
Average number drinks/drinking day	10.1 ± 6.9	9.6 ± 8.1	0.538
Other Substance Use Disorders			
None	55.4%	26.9%	<0.001
One	21.5%	48.7%	
Two	11.3%	19.2%	
Three or more	11.8%	5.1%	0.367
Marijuana	27.0%	22.1%	
Cocaine	23.6%	61.0%	
Opiate	8.4%	15.6%	0.051
Mental Health Disorders			
None	48.6%	51.3%	0.213
One	19.4%	11.5%	
Two	13.9%	11.5%	
Three or more	18.1%	25.6%	0.059
Affective disorder	40.9%	29.5%	
Anxiety disorder	36.5%	43.6%	
Antisocial personality disorder	16.0%	22.1%	0.196

	Caucasian (n = 381)	African American (n = 78)	<i>P</i> -value
Compulsive gambling disorder	7.1%	7.8%	0.827
Beck Depression Inventory (range 0-63)	13.1 ± 9.1	14.9 ± 11.1	0.130
Current use of antidepressants	51.4%	42.3%	0.141

* HS, high school; FTND, fagerstrom test for nicotine dependence; NRT, nicotine replacement therapy, SAM-DIS, substance abuse module of the Diagnostic Interview Schedule; ADS, alcohol dependence scale

Table 2
Tobacco Treatment Outcomes by Ethnicity and Treatment Group

	Caucasian			African American		
	Concurrent n=192	Delayed n=189	p-value	Concurrent n=36	Delayed n=42	p-value
7 Day Point Prevalent Smoking Abstinence						
3 months	15.6%	5.8%	0.002	22.2%	0%	0.001
6 months	11.5%	5.8%	0.050	16.7%	4.8%	0.084
12 months	14.6%	11.1%	0.311	11.1%	4.8%	0.294
18 months	13.0%	15.9%	0.428	8.3%	11.9%	0.604
Participation in Smoking Cessation Treatment						
Completed at least one intervention visit	80.7%	66.1%	0.001	72.2%	64.3%	0.454
Received nicotine replacement therapy	74.5%	63.0%	0.015	66.7%	64.3%	0.826

Table 3
Estimated Effect of Ethnicity and Treatment Group on Alcohol Outcomes*

	OR/HR	95% CI	F-Test	P-Value
6-months sustained abstinence				
Intervention by Ethnicity interaction			2.49	.116
<i>Caucasians</i>				
Concurrent vs. Delayed	1.74	1.21, 2.51	9.06	.003
<i>African Americans</i>				
Concurrent vs. Delayed	0.84	0.36, 1.94	.17	.680
Time to first use				
Intervention by Ethnicity interaction			5.26	.022
<i>Caucasians</i>				
Concurrent vs. Delayed	1.51	1.14, 2.00	8.36	.004
<i>African Americans</i>				
Concurrent vs. Delayed	0.66	0.34, 1.27	1.54	.215

* OR, odds ratio; HR, hazards ratio; CI, confidence interval