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Intensive intervention for alcohol-dependent smokers in early recovery: A randomized trial

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ABSTRACT

Introduction: The purpose of this study was to investigate the efficacy of an intensive tobacco cessation intervention for alcohol-dependent smokers in early recovery.
Methods: A total of 162 alcohol-dependent smokers were randomized to either intensive intervention for smoking cessation or usual care. The intensive intervention consisted of 16 sessions of individual cognitive behavior therapy (CBT) and combination nicotine replacement therapy that lasted 26 weeks. Usual care involved referral to a free-standing smoking cessation program that provided smoking cessation counseling of varying duration and guideline-concordant medications. The primary cessation outcome was verified 7-day point prevalence abstinence (PPA) at 12, 26, 38, and 52 weeks.
Results: At 12 and 26 weeks, the verified 7-day point-prevalence quit rate was significantly higher for the intensive intervention group than for the usual care group (both $p = 0.03$). However, the quit rates for the two treatment groups were not significantly different at 38 or 52 weeks. Verified 30-day alcohol abstinence rates were not significantly different for the two treatment groups at any of the follow-up assessments.
Conclusions: The intensive smoking cessation intervention yielded a higher short-term smoking quit rate without jeopardizing sobriety. A chronic care model might facilitate maintenance of smoking cessation during the first year of alcohol treatment and perhaps for longer periods of time. It is hoped that studies such as this will inform the development of more effective interventions for concurrent alcohol and tobacco use disorders.

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1. Introduction

More than one-half of individuals receiving treatment for alcohol use disorders (AUDs, including alcohol abuse and dependence) die from tobacco-related diseases (Hurt et al., 1996). The adverse health effects of chronic alcohol and tobacco use have been shown to be synergistic (Castellsague et al., 1999; Pelucchi et al., 2006). The combined use of alcohol and tobacco multiplies the risk of cancers of the upper respiratory and digestive tracts, including cancer of the mouth, throat, larynx and esophagus (Pelucchi et al., 2006). Furthermore, chronic smoking has been shown to be associated with a slowing of neurocognitive recovery in abstinent alcoholic patients (Durazzo et al., 2007).

Among individuals with AUDs compared with the general population, the prevalence of tobacco use is much higher and the quit rate much lower (Fertig, 2002; NIAAA, 1998; Sobell et al., 2002). Rates of tobacco use and nicotine dependence are higher among individuals who drink more heavily with the highest rates occurring among tobacco users with AUDs (Falk et al., 2006; Grant et al., 2004). Genetic, neurobiological, and behavioral factors have been hypothesized to explain the relationship between AUD and tobacco use (Kalman et al., 2009). Conversely, alcohol use and abuse are more prevalent among smokers than nonsmokers (Breslau, 1995; Le, 2002). Although the prevalence of cigarette smoking has declined in the United States, it has diminished little among individuals with AUDs (Fertig, 2002; Kozlowski et al., 1986; NIAAA, 1998; Sobell et al., 2002).

There is growing evidence to support smoking cessation concurrent with abstinence from alcohol and other drugs among

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alcohol-dependent smokers in early recovery (e.g., Baca and Yahne, 2009; Kalman, 1998; Prochaska et al., 2004; Sobell et al., 2002). The most recent Public Health Service clinical practice guidelines for smoking cessation (Fiore et al., 2008) encourage substance use disorder programs to address tobacco use among their patients. However, the timing of smoking cessation during early recovery continues to be the subject of debate. Proponents of concurrent treatment point to studies that show that smoking cessation during early recovery enhances long-term recovery/sobriety (Friend and Pagano, 2005; Prochaska et al., 2004). Smokers in the early stages of substance abuse treatment are generally aware of the health consequences of tobacco use and are interested in receiving help to quit smoking (Baca and Yahne, 2009; Joseph et al., 2004a,b). Other experts, however, point to evidence that questions the strategy of encouraging smoking cessation concurrently with the initiation of treatment for alcohol and other substance use disorders (Joseph et al., 2004a,b). This latter viewpoint is supported by data that show that quit rates are higher among individuals with longer periods of recovery/sobriety (Kalman et al., 2006).

Smoking cessation interventions conducted concurrently within the context of substance use disorder (SUD) treatment have been shown to yield variable quit rates (Kalman et al., 2009). Point-prevalence quit rates from tobacco use at 6 months range from 2% to 18% (Baca and Yahne, 2009). Although modest, these quit rates are clinically significant, given the major health gains that result from smoking cessation (West, 2007). In general, interventions with more modalities and greater intensity have yielded higher quit rates (Fiore et al., 2008). The clinical trial that produced the highest smoking abstinence rate to date utilized an intensive level of counseling, nicotine replacement medication, and was fully integrated into a residential SUD treatment program (Burling et al., 2001).

In the present study, we investigated the efficacy of an intensive intervention for smoking cessation compared with usual care. The intensive intervention consisted of 16 sessions of individual cognitive behavior therapy (CBT) and combination nicotine replacement therapy (NRT) that lasted 26 weeks. Several components of the CBT were designed to facilitate both short-term and long-term quit rates, including motivational enhancement and skills training for mood management, behavioral activation, facilitation of social support, and weight management. Usual care involved referral to a free-standing smoking cessation program that provided brief smoking cessation counseling and guideline-concordant medications. It was hypothesized that the intensive intervention would yield a significantly higher biochemically verified 7-day point-prevalence quit rate from tobacco use at 26 weeks (end of treatment) and at 52 weeks (end of study) than usual care. Second, it was hypothesized that the alcohol abstinence rate for the intensive intervention condition would not be significantly higher at 26 and 52 weeks than that for the usual care group. There is both theoretical support and empirical evidence to dispel the belief that smoking cessation jeopardizes sobriety during early recovery. For example, studies on the conditioned stimulus effects resulting from the repeated pairing of smoking cues with drinking behavior (Cooney et al., 2003) suggest that discontinuation of smoking would eliminate one of the cues triggering the desire to drink.

2. Methods

2.1. Design

The present study utilized a parallel, unblinded randomized design with two treatment arms. The consort flow chart for the study is presented in Fig. 1. Assessments were conducted at baseline and at weeks 12, 26, 38, and 52. The two interventions were implemented between the baseline and 26-week assessment. Thus, the assessment visit at week 12 was scheduled at mid-treatment, the end-of-treatment (EOT) assessment was conducted at week 26, and follow-up assessments were scheduled at weeks 38 (12 weeks after EOT) and 52 (end of study and 26 weeks after EOT).

2.2. Participants

Participants were 162 US veterans (157 males and 5 females) recruited from the Drug and Alcohol Treatment (DAT) programs at the San Francisco Veterans Affairs Medical Center (SFVAMC) and Martinez VA Outpatient Clinic. Local institutional review board approval was obtained and all participants provided written informed consent at the time of enrollment (Clinical Trials.gov Identifier: NCT00217984).

2.2.1. Eligibility criteria. We sought to include lighter smokers in the study sample and excluded DAT patients with less than one week of sobriety to reduce the risk of early dropout. Thus, DAT patients were considered eligible to participate if they were at least 18 years old, reported alcohol as primary drug of abuse, were currently smoking at least 5 cigarettes per day, were abstinent from alcohol for at least 7 days, and reported an interest in quitting smoking. Exclusion criteria included: any contraindications for nicotine patches or adjuvant nicotine medications (e.g., unstable angina or recent myocardial infarction, skin allergy to the nicotine patch, severe cardiovascular disease, lactation, pregnancy by self-report or by positive serum pregnancy test in pre-menopausal women), unstable psychiatric disorder, and severe cognitive impairment.

2.2.2. Randomization. Participants were randomly assigned to participate either in intensive intervention or usual care, using a computer-generated random assignment list. Randomization was stratified on the basis of number of cigarettes per day at baseline (20+ per day, ≤20 per day), depression (past, current, and none), and use/abuse of other drugs (cocaine, other, and none).

2.2.3. Study interventions. The intensive intervention consisted of 16 sessions of individual cognitive behavior therapy (CBT) for smoking cessation, including mood management, 16 weeks of nicotine patches, and 26 weeks of nicotine lozenges. The intervention protocol was based on treatment protocols developed by Hall et al. (2009). The first 5 sessions focused on the health consequences of smoking and preparation for the quit date. The final 11 sessions included treatment modules addressing skills training in mood management, cognitive restructuring, behavioral activation, social support, and weight management. The first 12 sessions were scheduled on a weekly basis, with sessions 13 and 14 conducted on alternate weeks, and the final two sessions scheduled four weeks apart. Usual care involved referral to the medical center's smoking cessation clinic. The intervention period lasted 26 weeks. A randomly selected subset of treatment sessions was audio taped to assess therapist competence/skill level and adherence to the intervention protocol, using an adherence and competence/skill level checklist adapted from Vallis and colleagues (1986). Adherence and competence/skill level percentage scores were calculated across all therapists and intervention sessions. The mean percentage score was 86% for adherence and 82% for competence/skill level.

2.3. Measures

2.3.1. Smoking abstinence outcomes. Abstinence outcomes conformed to the guidelines of the Society of Research on Nicotine and Tobacco (Hughes et al., 2003). Validated 7-day point prevalence abstinence served as our primary outcome and was defined as a self-reported no smoking, not even a puff, in the 7 days prior to each of the assessment visits combined with a carbon monoxide (CO) level <10 ppm. According to Hughes et al. (2003), CO is comparable to cotinine as a method of biochemical verification of point-prevalence abstinence. To assess cigarette smoking status at baseline and point-prevalence abstinence at the follow-up assessments, participants were asked: (1) "Have you smoked cigarettes in the past 7 days?" and (2) "On average, how many cigarettes do you currently smoke per day?" Sustained abstinence (SA) and prolonged abstinence (PA) were secondary smoking cessation outcomes. SA was defined as verified point-prevalence abstinence at all four assessments. A 90-day timeline follow-back (TLFB; Brown et al., 1998) was used to assess use of tobacco and alcohol at 12, 26, 38, and 52 weeks. PA was defined as reporting smoking abstinence for greater than 7 days in a row at any time covered by the TLFB and verified by exhaled CO < 10 ppm at any of the follow-up assessments that occurred within the PA reporting period.

2.3.2. Use of alcohol and other drugs. The Alcohol/Drugs subsection from the Addiction Severity Index (ASI; McLellan et al., 1980, 1985, 1992) was used to characterize substance use patterns and other substance- and treatment-related variables. The ASI has been shown to be a valid and reliable measure of substance abuse (McLellan et al., 2006). Appleby et al. (1997) reported standardized Cronbach alphas of 0.89 for the alcohol scale. Verified 30-day point prevalence abstinence served as our primary alcohol outcome measure and was defined as a self-report of no drinking during the 30 days prior to each of the assessments combined with a negative breath analysis. The 90-day TLFB conducted at 12, 26, 38, and 52 weeks also included an assessment of alcohol use.

2.3.3. Nicotine dependence. Nicotine dependence was measured on the Composite International Diagnostic Interview (CIDI; World Health Organization, 1997) and

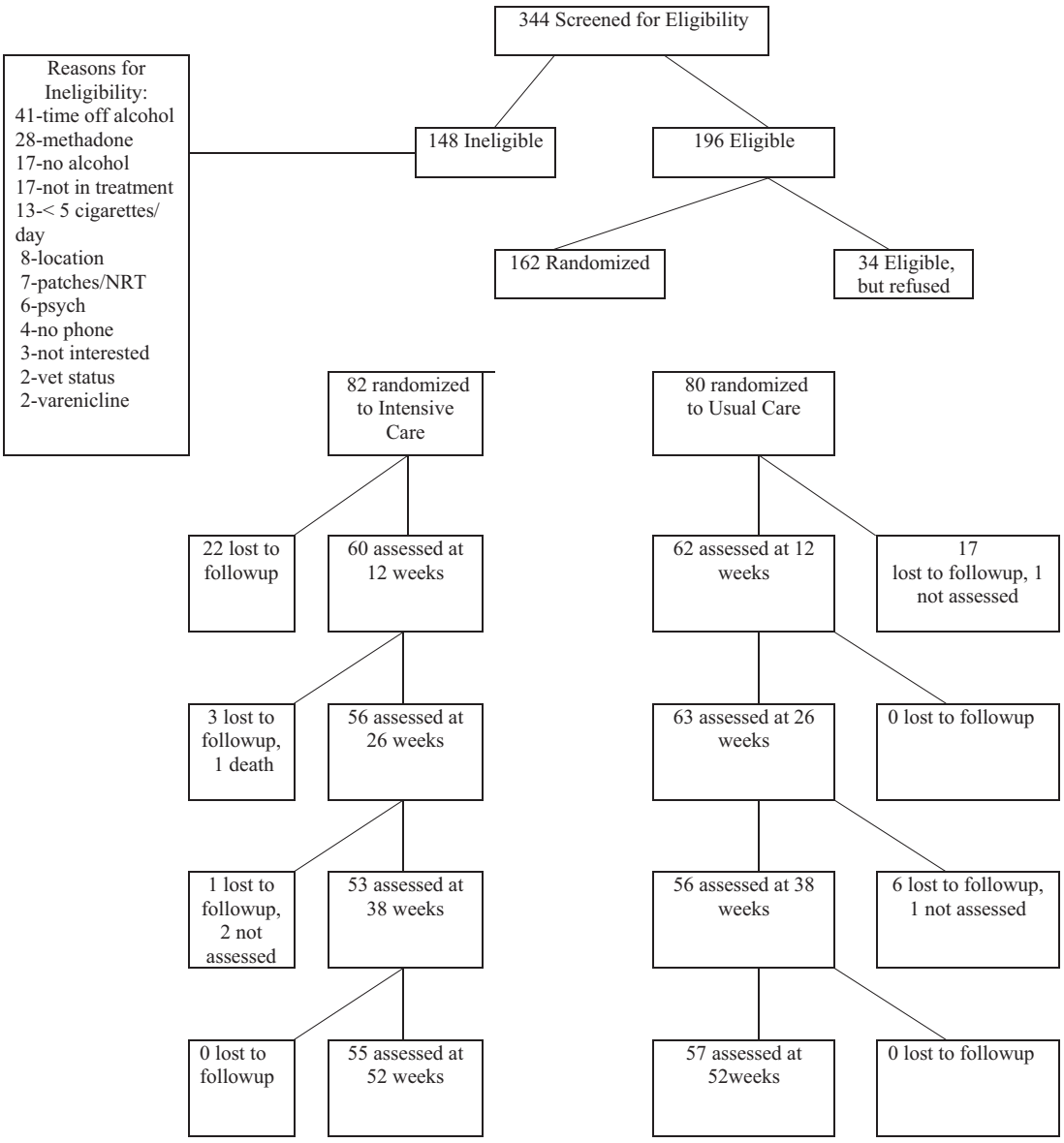

Fig. 1. Consort flow chart.

Fagerström Test for Nicotine Dependence (FTND; Heatherton et al., 1991). The FTND has internal consistency and construct validity (Payne et al., 1994).

2.3.4. Abstinence thoughts. The Thoughts about Abstinence (TAA) Form (Hall et al., 1990, 1991; Wasserman et al., 2001) was used to assess desire to quit using tobacco and alcohol, expected success in quitting, expected difficulty of quitting, and abstinence goals (total and permanent abstinence versus less restrictive goals). The TAA was administered at baseline and at each of the subsequent assessment visits. Responses to these items are validated predictors of abstinence during and after substance abuse treatment (Hall et al., 1990, 1991; Wasserman et al., 2001).

2.3.5. Emotional distress. The composite score for the Psychiatric Status Index on the Addiction Severity Index (ASI-PSI; McLellan et al., 1980, 1985, 1992) served as a global measure of emotional distress. The ASI-PSI has been shown to be a valid and reliable measure of psychiatric problems associated with substance abuse (McLellan et al., 2006). Level/severity of depressive symptoms was assessed using the Beck Depression Inventory (BDI; Beck et al., 1961). The reliability and validity of the BDI has been demonstrated in numerous studies. In samples of psychiatric patients, the internal consistency of the BDI was shown to be strong (mean Cronbach's coefficient alpha = 0.86; Beck and Steer, 1984). The measures of emotional distress were administered at each assessment visit.

2.3.6. Lifetime history of mood disorders. The Composite International Diagnostic Interview (CIDI; World Health Organization, 1997) was used to identify lifetime diagnoses of mood disorders, including bipolar disorder, major depression, and dysthymic disorder. The CIDI is a comprehensive, fully structured diagnostic interview for the assessment of mental disorders that has been used successfully in large epidemiologic studies such as the National Comorbidity Survey (Kessler et al., 1994) and was chosen as the psychiatric diagnostic instrument for the National Institute on Drug Abuse (NIDA) Clinical Trials Network. To maximize efficiency and minimize clerical errors, we used sections of the CIDI-Auto v 2.1 (Robins et al., 2000), the most recent revision of the computerized CIDI to generate DSM-IV lifetime diagnoses of mood disorders.

2.3.7. Quit attempts and use of smoking cessation treatment modalities. At each follow-up visit at weeks 12, 26, 38, and 52, participants in both treatment groups were asked about their quit attempts, level of withdrawal discomfort associated with each attempt, and use of smoking cessation treatment modalities, including NRT and other medications, received within the study and elsewhere. Participants were asked to recall the number of quit attempts and treatment modalities associated with each quit attempt, and withdrawal discomfort was assessed on a 10-point Likert scale.

2.3.8. Intensive intervention attendance. Participants in the intensive intervention group attended an average of 8 sessions and 16 participants (27%) attended all 16 sessions.

Table 1
Baseline characteristics.

Variable	Response	Usual care (*N* = 80)		Intensive (*N* = 82)	
		N	%	*N*	%
Sex	Male	76	95.0	81	98.8
	Female	4	5.0	1	1.2
Hispanic	Yes	6	7.5	9	11.0
	No	73	91.3	73	89.0
	Unsure	1	1.3		
Race	African-American/Black	33	41.3	27	32.9
	Caucasian/White	36	45.0	42	51.2
	Other	11	13.8	13	15.9
Marital status	Married	9	11.3	6	7.3
	Widowed	6	7.5	3	3.7
	Other	65	81.3	73	89.0
Degree	HS/GED	46	57.5	52	63.4
	Post-secondary	28	35.0	23	28.1
	Missing	6	7.5	7	8.5
Employment	Unemployed	69	86.3	62	75.6
	Employed/retired etc.	11	13.8	20	24.4
Living situation	House/apartment [own]	14	17.5	10	12.2
	House/apartment [others]	5	6.3	11	13.4
	Halfway house	34	42.5	36	43.9
	SRO room/hotel/motel	2	2.5	5	6.1
	Homeless	24	30.0	18	22.0
	Institution			1	1.2
	Other			1	1.2
	Missing	1	1.3		
Income	<$10,000	43	53.8	52	63.4
	≥$10,000	37	46.3	30	36.6
Quit smoking forever	Yes	56	70.0	54	65.9
	Other	24	30.0	28	34.2
Quit drinking forever	Yes	53	66.3	49	59.8
	Other	27	33.8	33	40.3
		Mean	SD	Mean	SD
Age		48.0	7.75	52.0	7.35
Cigarettes, 24 h		17.1	10.24	16.5	10.76
Years smoking		29.3	10.01	34.3	10.45
Times quit		5.2	11.56	4.8	14.20
FTND		4.2	2.24	4.2	2.51
BDI		14.0	9.37	14.3	11.6
ASI					
	Alcohol use, days last 30 days	3.2	5.24	3.8	5.78
	Alcohol use, years	25.6	11.43	30.6	11.20
	Cocaine use, days last 30 days	1.5	3.6	0.7	2.65
	Cocaine use, years	9.5	10.57	9.2	10.72
	>1 drug, days last 30 days	2.0	4.31	2.1	5.35
	>1 drug, years	13.1	10.7	14.4	13.12
	ASI alcohol use	0.2	0.24	0.2	0.24
	ASI drug use	0.1	0.09	0.1	0.08
	ASI psychiatric	0.2	0.26	0.3	0.25
TAA – cigarettes					
	Desire to quit	9.1	1.48	9.1	1.41
	Expect to be difficult	6.4	3.04	6.4	2.67
	Expect to be successful	8.1	1.93	7.7	2.24
TAA – alcohol					
	Desire to quit	9.5	1.00	9.0	1.68
	Expect to be difficult	5.3	2.88	5.6	2.95
	Expect to be successful	9.0	1.33	8.6	2.02

FTND = Fagerström test of nicotine dependence; BDI = Beck Depression Inventory; ASI = Addiction Severity Index; TAA = thoughts about abstinence.

2.4. Data analysis

Because generalized estimating equations (GEE) assume that missing data occur randomly, any violation of this assumption can lead to biased estimates (Schneider et al., 2010). We therefore tested to see if there was evidence that outcomes were related to non-random missingness by including the percentage of assessments positive for smoking in models of whether participants completed all assessments and the number of assessments attended. Because we could not assume that missingness was completely random, we used a mixed-effects regression model via Proc Nlmixed in SAS version 9.2 to compare the verified point prevalence abstinence rates across the post-baseline assessments. Terms in the model were the treatment condition (Intensive or Usual Care), week of the assessment (12, 26, 38, and 52) and their interaction. The model estimation allowed full use of all observed data. We also included the number of assessments attended as a covariate in the preliminary model.

In secondary analyses, we modeled across assessments the number of cigarettes reportedly smoked in the prior 7 days and CO levels using a mixed effects model by Proc Mixed in SAS that included the same three terms of treatment condition, time, and their interaction. Comparisons of whether participants made a quit attempt or used a quit modality (e.g., NRT) were similarly tested with Proc Nlmixed. Proportions achieving sustained and prolonged abstinence were compared using Pearson's chi-square test.

We investigated the potentially moderating effects of four measures assessed at the point of study intake: level/severity of depression symptoms as measured by the BDI total score, FTND total score, lifetime history of mood disorder, and expectation of success. This investigation was accomplished by estimating and testing the model of point prevalence abstinence with these four variables and their interaction with treatment condition added to the main model which also included treatment condition, assessment week, and their interaction term.

Table 2
Estimates and tests of model parameters.

Parameter	Estimate	SE	DF	*t* value	Pr > |*t*|
Intercept	−8.11	1.8030	139	−4.50	<0.0001
Condition	3.77	1.6399	139	2.30	0.0229
Time	0.041	0.0259	139	1.57	0.1183
Cond × Time	−0.066	0.0322	139	−2.06	0.0416

3. Results

3.1. Study sample characteristics

Study sample characteristics are presented in Table 1. The sample consisted of US veterans, 97% male, with 48% identifying as Caucasian and 37% identifying as African-American. The mean age was 50 years. Marital status was predominantly single (91%), and 69% of the sample had a high school education or less. A total of 81% were unemployed and 83% had an annual income less than $21,000, and 43% reported that they lived in half way house/therapeutic communities, whereas 26% were homeless. The mean total score of 4.1 (*SD* = 2.37) on the FTND and average smoking rate (17 cigarettes per day) reflected the range of smoking behavior in the study sample due to eligibility criteria that included lighter smokers and those who were cutting down on their smoking in anticipation of quitting. The mean score of 0.25 (*SD* = 0.25) on the ASI-PSI exceeded the mean score of 0.10 for the general population (McLellan et al., 1985, 1992) and the mean score of 0.19 (SD = 0.23) for the total nationally representative sample of 8429 patients recruited from over 300 substance abuse programs (McLellan et al., 2006). In addition to alcohol use, use of cocaine, cannabis, and more than one drug were comparable to those reported in other studies of smoking cessation in DAT settings (e.g., Burling et al., 2001; Joseph et al., 2004a,b).

3.2. Tobacco use outcomes

As shown in Fig. 2, verified point prevalence abstinence was greater for the intensive intervention compared with usual care at each post-baseline assessment, mainly at weeks 12 and 26 where the absolute difference was approximately 15%. Both the effects for treatment condition and the interaction of treatment condition × time of assessment reached statistical significance. Estimates from the mixed-effects regression model are summarized in Table 2. The inclusion of the number of assessments attended did not alter this result and it was not a significant predictor.

As shown in Fig. 3 (left panel), the average number of cigarettes smoked in the 7 days prior to each assessment averaged between 65 and 73 in the usual care condition. The intensive treatment

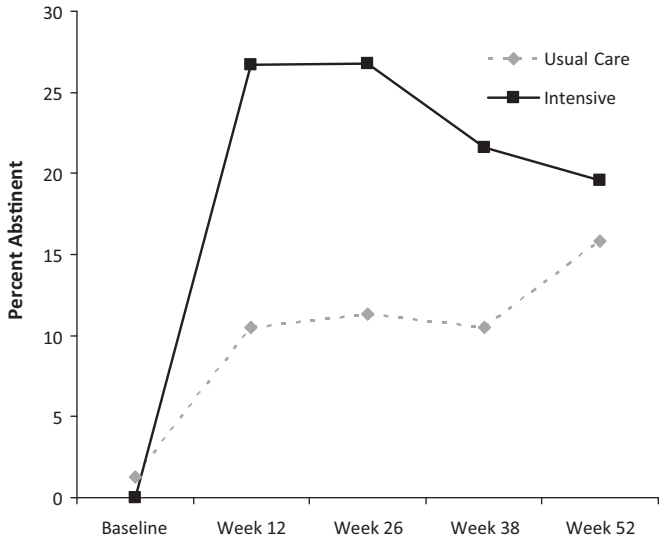

Fig. 2. Verified point prevalence abstinence rates by treatment condition and time.

condition means were lower at weeks 12, 26 and 38, but not at 52 weeks. Both the test of time ($p < 0.0001$) and condition by time ($p = 0.04$) were significant. CO levels were also lower for the intensive condition, with a significant effect for condition ($p = 0.04$). No between-group differences were found in sustained or prolonged abstinence.

In comparing treatment conditions at each assessment as to whether participants made a quit attempt or used a quit modality (e.g., NRT), a similar pattern was found on these two measures. Significantly more participants in the intensive treatment reported a quit attempt at week 12 (40% vs. 18%, $p = 0.003$) and the use of a quit modality at week 12 (39% vs. 18%, $p = 0.005$) compared with the usual care group. No differences, however, were found at subsequent assessments.

In our moderator analysis, only lifetime mood disorder was significant ($p = 0.0008$), but the interaction was not ($p = 0.07$). Overall, those with a history of mood disorder were more likely to achieve verified abstinence, especially those in the intensive condition (Fig. 4). At weeks 12 and 26, the quit rate for participants with no history of mood disorders in the intensive intervention was slightly higher than the quit rate for those with a history of mood disorders in the usual care condition, but this trend was reversed at weeks 38 and 52. The number of participants abstinent for any subgroup, depending on treatment condition, time, and history of mood disorder was quite low, ranging from 1 to 8 [note; in this model, treatment condition was no longer significant]. In the models for the three non-significant covariates (BDI

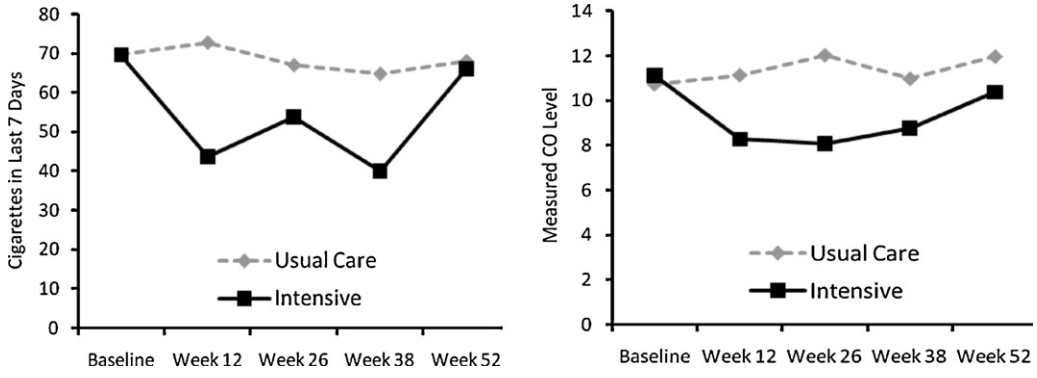

Fig. 3. Mean number of cigarettes (left panel) and CO levels by treatment condition and time.

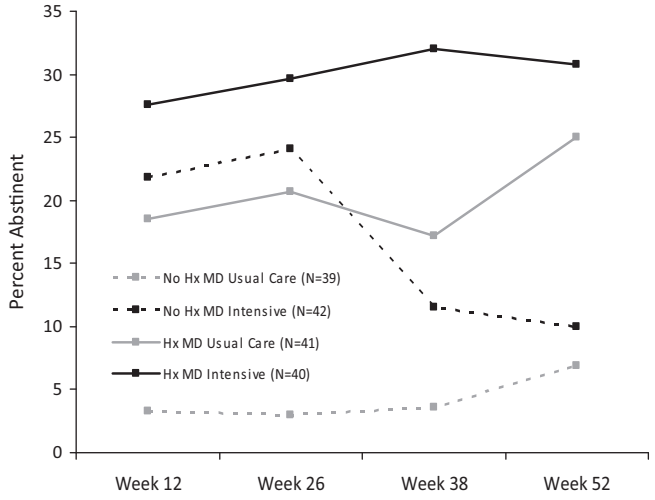

Fig. 4. Verified point prevalence abstinence rates by treatment condition, time and history of mood disorder.

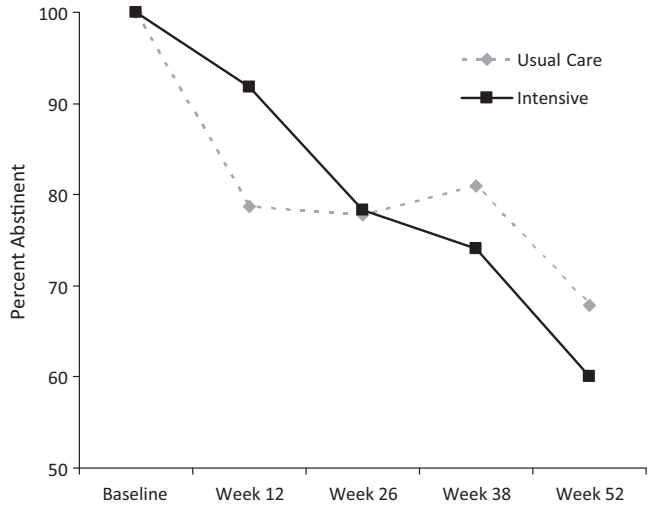

Fig. 5. Percent abstinent from alcohol by treatment condition.

total score, FTND total score, and expectation of success), treatment condition remained significant.

To further investigate the association between history of mood disorder and verified smoking abstinence, we compared the groups with and without a history of mood disorders on baseline BDI total scores and changes in BDI total scores from baseline to 12 weeks. The results revealed that the group with a history of mood disorders had significantly higher BDI total scores at baseline than the group with no such history and that their BDI total scores decreased from baseline to 12 weeks significantly more than the total scores for the group with no history of mood disorders. In addition, the two groups were not significantly different on the FTND total score or number of cigarettes smoked during the week before baseline.

3.3. Alcohol use outcomes

Treatment condition comparisons for the proportion abstinent from alcohol at each assessment are presented in Fig. 5. The treatment condition difference was not significant ($p = 0.08$), but the time effect (<0.001), a result of the declining rates of abstinence, and treatment condition × time interaction (0.03), illustrated by the crossing of the lines, were significant. The abstinence rate for the usual care group dropped below the abstinence rate for the intensive condition at 12 weeks. The abstinence rates for the two groups were equivalent at 78% at Week 26. The differences between the two conditions were virtually the same (7% and 8%) at Weeks 38 and 52.

4. Discussion

The findings partially confirmed our primary hypothesis. At 12 and 26 weeks, the verified 7-day point-prevalence quit rate was significantly higher for the intensive intervention group than for the usual care group. Quit attempts and use of treatment modalities, such as NRT, were also significantly higher for participants in the intensive intervention than those in the usual care group. The combination of extended CBT and combination NRT appeared to facilitate efforts to quit as well as successful quitting through the end of treatment at 26 weeks. The intensive smoking cessation intervention yielded a significantly higher quit rate than usual care at the end of treatment. Significantly more participants in the intensive condition reported a quit attempt and use of at least one treatment modality by week 12 than participants in the usual care group. The quit rate achieved by the intensive intervention group at 26 weeks (end of treatment) compared favorably with results of previous studies of alcohol-dependent smokers in early recovery (Kalman et al., 2009).

However, the benefit of the intensive intervention was short-lived as the difference in quit rates for the two treatment conditions became attenuated and was no longer significant at 38 and 52 weeks. A number of factors likely contributed to the lack of maintenance of the higher quit rate for the intensive intervention. First, the intensive intervention was not fully integrated into the DAT program since it was conducted by trained research assistants, not program staff. During the follow-up period, there may not have been sufficient support from program staff to sustain abstinence from tobacco among short-term quitters in the intensive intervention group. Second, it is possible that intensive intervention participants did not attend enough sessions to learn the skills they needed to maintain abstinence after the end of treatment, and the differences observed at earlier assessments reflect an effect due to nonspecific differences in therapeutic support. Only 27% of intensive intervention participants attended all 16 sessions. However, post hoc analysis revealed that the number of intervention sessions attended was not associated with quit rates at any of the follow-up assessments. Third, the intensive intervention was conducted over a period of 26 weeks. Although this intervention lasted longer than most tobacco cessation treatments, it may not have been long enough to prevent relapse. Not only duration, but number and type of intervention modalities and forms of counseling delivery (e.g., group versus individual face-to-face versus individual telephone-delivered) need to be considered. In other studies, both pharmacological and behavioral forms of extended treatment have shown promise in improving sustained smoking cessation outcomes (Hall et al., 1998, 2004, 2009). Following a chronic care model, telephone-delivered counseling has been used to support maintenance of sobriety in drug and alcohol treatment settings (McKay et al., 2010).

We also hypothesized that the alcohol abstinence rates would not be significantly different for the two treatment conditions. The results showed that participation in the intensive intervention did not appear to interfere with alcohol recovery/sobriety. Self-reported 30-day alcohol abstinence rates decreased in a similar trend for both treatment groups during the 52 weeks of the study. A majority of the empirical evidence supports the view that initiating smoking cessation during early recovery enhances outcomes for both tobacco and other substance use (Friend and Pagano, 2005;

Prochaska et al., 2004). The one exception is the large-scale (Joseph et al., 2004a,b) study of military Veterans with AUD in which concurrent cessation of tobacco and alcohol within the first six months of substance abuse treatment was associated with lower alcohol abstinence rates at 12 months.

Surprisingly, a history of mood disorders was associated with a higher smoking quit rate in the present study. This group included participants with a history of major depression, bipolar, and dysthymic disorders. The association between history of mood disorders and quit rate was stronger in the intensive intervention group, but occurred across both treatment conditions. Thus, regardless of whether participants with a history of mood disorders were exposed to the intensive intervention, which included mood management, they were more successful in quitting smoking and staying quit than participants with no history of mood disorders. Post hoc analyses revealed that the group with a history of mood disorders had significantly higher BDI total scores at baseline than the group with no history of mood disorders and their level of depressive symptoms decreased from baseline to 12 weeks significantly more than for the group with no history of mood disorders. All participants with a history of mood disorders may have benefited more from the structure of the SUD program and frequent contact with counselors in the DAT. However, history of mood disorders was not associated with number of intensive intervention sessions attended and confirmation of this unexpected finding is required in future analyses/studies. There is considerable variability in patterns of depressive symptoms during quitting among smokers with a history of major depressive disorder (Burgess et al., 2002). Some smokers with depressive disorders have been shown to experience significant improvements in their symptoms and cravings for nicotine while participating in intensive smoking cessation interventions (Blalock et al., 2008). However, this does not explain why participants with a history of mood disorders in the present study who were assigned to the usual care condition quit at a higher rate than those with no history of mood disorders.

Co-occurring psychiatric disorders such as major depression are common in alcohol-dependent smokers (Burling et al., 1997; Covey et al., 1993; Kodl et al., 2008; Kranzler et al., 1996; Miller et al., 1997). However, a history of depressive disorders does not necessarily mean that an individual will experience significant emotional distress at the time of early recovery and smoking cessation efforts. Kodl et al. (2008) recently examined the effects of depressive symptoms on abstinence from tobacco and alcohol after treatment for alcohol and nicotine dependence and found that depressive symptoms were prospectively related to alcohol use, but were not related to subsequent tobacco use. Nevertheless, mood management has been recommended as a critical component to tobacco use treatments for alcohol-dependent smokers with co-occurring major depression (Patten, 2002; Steinberg et al., 2004). The results of the present study suggest that history of mood disorders by itself may not be indicative of the need for mood management in alcohol-dependent smokers in early recovery or prognostic of poorer outcome.

In addition to the presence of psychiatric co-morbidities, alcohol-dependent tobacco smokers are more likely to come from a background of socioeconomic disadvantage (Daeppen et al., 2000) and lack effective coping skills for managing dysphoric mood states and substance-related urges (Burling et al., 1997; Steinberg et al., 2004). The demographic characteristics of the participants in the present study indicated a level of socioeconomic disadvantage that is consistent with that observed in veterans enrolled in VA substance abuse treatment programs, particularly those located in urban centers (Burling et al., 1997). Alcohol-dependent tobacco smokers are less likely to be employed, have less education, drink more alcohol, and have greater and earlier onset of alcohol problems than alcohol dependent nonsmokers (Daeppen et al., 2000). The challenges of marginal housing, poverty, and social alienation represent additional obstacles to concurrent cessation of tobacco and alcohol. Therefore, tobacco and alcohol cessation outcomes may be enhanced by intervention techniques that minimize the impact of socioeconomic disadvantage such as adjusting the reading/literacy level of educational materials, expanding social support for cessation, and linking interventions to housing and employment resources (Gordon et al., 1988).

There were a number of limitations to the present study. Participants were mostly male military Veterans and the findings may not generalize to non-Veterans or women. Second, the sample size was large enough to test the primary hypotheses, but power was less than optimal for investigating moderators and mediators of treatment outcomes. Third, the completion rate for follow-up assessments was lower than anticipated, despite extensive cohort maintenance efforts. Fourth, CO and alcohol breath tests for verification of abstinence from tobacco and alcohol have limited usefulness for assessing sustained and prolonged abstinence. Fifth, the assessment focused on efficacy alone. Assessment of acceptability, practicality, cost, and feasibility are needed to determine the suitability of the intervention for use in specific DAT clinical settings.

There are an increasing number of empirical studies aimed at developing more effective smoking cessation treatments for smokers with AUD and successfully integrating such interventions into the substance abuse treatment setting (Burling et al., 2001; Drake et al., 1998; Thompson et al., 1988). Burling et al. (2001) compared the efficacy of two intensive smoking cessation interventions within the context of residential drug and alcohol treatment. One treatment condition focused exclusively on smoking cessation and the other used the smoking cessation experience as an opportunity for "generalization training" from cigarettes to drugs and alcohol. During daily relapse prevention training, participants in both treatment conditions identified their high-risk situations for smoking and learned and practiced coping skills (both in session and *in vivo*) that could be used in these situations. Participants in the latter intervention continually examined the similarities between successfully quitting smoking and drug and alcohol use, and they learned how each smoking cessation technique (e.g., contingency contracting) could be applied to quitting drugs and alcohol. They identified high-risk situations that were common to their smoking and drug and alcohol use, and learned coping skills that could be used to prevent relapse to both cigarettes and drugs and alcohol. Both interventions yielded significantly higher smoking abstinence rates at 12 months than usual care. The residential drug and alcohol treatment setting lends itself to such high-intensity and well integrated smoking cessation interventions.

Integrated models of treatment delivery show promise, as demonstrated by the successful incorporation of smoking cessation in mental health and substance abuse programs (Hall and Prochaska, 2009) and the integration of smoking cessation interventions in VA specialty mental health clinics providing treatment for veterans with post-traumatic stress disorder (McFall et al., 2005, 2006, 2007, 2010). As research on treatment efficacy moves forward, consideration of interactions between specific intervention components, process factors, and patient attributes (Imel et al., 2008) will be useful in designing future treatment outcome studies for cigarette smokers with alcohol and other substance use disorders.

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Contributors

The authors listed all qualify for authorship and have participated sufficiently in the work to take responsibility for the publication. Timothy Carmody, Kevin Delucchi, Carol Duncan, and Sharon Hall made substantial contributions to the design, data collection, analysis, literature review, and writing of the manuscript. Sharon Solkowitz, Joy Huggins, and Sharon Lee made substantial contributions to the data collection and literature review. Peter Banys made substantial contributions to the design, data collection, and literature review. Joel Simon made substantial contributions to the data collection, analysis, and writing of the manuscript. All the authors have given final approval of the submission.

Conflict of interest

There are no disclosures for any authors.

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References

Appleby, L., Dyson, V., Altman, E., Luchins, D.J., 1997. Assessing substance use in multiproblem patients: reliability and validity of the Addiction Severity Index in a mental hospital population. J. Nerv. Ment. Disord. 185, 159–165.

Baca, C.T., Yahne, C.E., 2009. Smoking cessation during substance abuse treatment: what you need to know. J. Subst. Abuse Treat. 36, 205–219.

Beck, A.T., Steer, R.A., 1984. Internal consistencies of the original and revised Beck Depression Inventory. J. Clin. Psychol. 40, 1365–1367.

Beck, A.T., Ward, C.H., Mendelsohn, M., Mock, J., Erbaugh, J., 1961. An inventory for measuring depression. Arch. Gen. Psychiatry 4, 561–571.

Blalock, J.A., Robinson, J.D., Wetter, D.W., Schreindorfer, L.S., Cinciripini, P.M., 2008. Nicotine withdrawal in smokers with current depressive disorders undergoing intensive smoking cessation treatment. Psychol. Addict. Behav. 22, 122–128.

Breslau, N., 1995. Psychiatric comorbidity of smoking and nicotine dependence. Behav. Genet. 25, 95–101.

Brown, R.A., Burgess, E.S., Sales, S.D., Whiteley, J.A., Evans, D.M., Miller, I.W., 1998. Reliability and validity of a smoking timeline follow-back interview. Psychol. Addict. Behav. 12, 101–112.

Burgess, E.S., Brown, R.A., Kahler, C.W., Niaura, R., Abrams, D.B., Goldstein, M.G., Miller, I.W., 2002. Patterns of change in depressive symptoms during smoking cessation: who's at risk for relapse? J. Consult. Clin. Psychol. 70, 356–361.

Burling, T.A., Burling, A.S., Latini, D., 2001. A controlled smoking cessation trial for substance dependent inpatients. J. Consult. Clin. Psychol. 69, 295–304.

Burling, T.A., Ramsey, T.G., Seidner, A.L., Kondo, C.S., 1997. Issues related to smoking cessation among substance abusers. J. Subst. Abuse 9, 27–40.

Castellsague, X., Munoz, N., De Stefani, E., Victora, C.G., Catelletto, R., Rolon, P.A., Quintana, M.J., 1999. Independent and joint effects of tobacco smoking and alcohol drinking on the risk of esophageal cancer in men and women. Int. J. Cancer 82, 657–664.

Cooney, J.L., Cooney, N.L., Pilkey, D.T., Kranzler, H.K., Oncken, C.A., 2003. Effects of nicotine deprivation on urges to drink and smoke in alcoholic smokers. Addiction 98, 913–921.

Covey, L.S., Glassman, A.H., Stetner, F., Becker, J., 1993. Effect of history of alcoholism or major depression on smoking cessation. Am. J. Psychiatry 150, 1546–1547.

Daeppen, J.B., Smith, T.L., Danko, G.P., Gordon, L., Landi, N.A., Nurnberger, J., Bucholz, K.K., Raimo, E., Schuckit, M.A., the Collaborative Study Group on the Genetics in Alcoholism, 2000. Clinical correlates of cigarette smoking and nicotine dependence in alcohol-dependent men and women. Alcohol Alcohol. 35, 171–175.

Drake, R.E., Mercer-McFadden, C., Mueser, K.T., McHugo, G.J., Bond, G.R., 1998. Review of integrated mental health and substance abuse treatment for patients with dual disorders. Schizophren. Bull. 24, 589–608.

Durazzo, T.C., Rothlind, J.C., Gazdzinski, S., Banys, P., Meyerhoff, D.J., 2007. Chronic smoking is associated with differential neurocognitive recovery in abstinent alcoholic patients: a preliminary investigation. Alcohol Clin. Exp. Res. 31, 1114–1127.

Falk, D.E., Yi, H.-Y., Hiller-Sturmhöfel, S., 2006. An epidemiologic analysis of co-occurring alcohol and tobacco use and disorders. Alcohol Res. Health 29, 162–171.

Fertig, J.B., 2002. Overview-alcohol and tobacco: mechanisms and treatment. Alcohol. Clin. Exp. Res. 26, 1909–1910.

Fiore, M.C., Jaen, C.R., Baker, T.B., 2008. Treating Tobacco Use and Dependence: 2008 Update. Clinical Practice Guideline. U. S. Department of Health and Human Services. Public Health Service, Rockville, MD.

Friend, K.B., Pagano, M.E., 2005. Smoking cessation and alcohol consumption in individuals in treatment for alcohol use disorders. J. Addict. Disord. 24, 61–75.

Gordon, S.M., Kennedy, B.P., McPeake, J.D., 1988. Neuro-psychologically impaired alcoholics: assessment, treatment considerations, and rehabilitation. J. Subst. Abuse 5, 99–104.

Grant, B.F., Hasin, D.S., Chou, S.P., Stinson, F.S., Dawson, D.A., 2004. Nicotine dependence and psychiatric disorders in the United States. Arch. Gen. Psychiatry 61, 1107–1115.

Hall, S.M., Havassy, B.E., Wasserman, D.A., 1990. Commitment to abstinence and acute stress in relapse to alcohol, opiates, and nicotine. J. Consult. Clin. Psychol. 58, 175–181.

Hall, S.M., Havassy, B.E., Wasserman, D.A., 1991. Effects of commitment to abstinence, positive moods, stress, and coping on relapse to cocaine use. J. Consult. Clin. Psychol. 59, 526–532.

Hall, S.M., Humfleet, G.L., Munoz, R.F., Reus, V.I., Robbins, J.A., Prochaska, J.J., 2009. Extended treatment of older cigarette smokers. Addiction 104, 1043–1052.

Hall, S.M., Humfleet, G.L., Reus, V.I., Munoz, R.F., Cullen, J., 2004. Extended nortriptyline and psychological treatment for cigarette smoking. Am. J. Psychiatry 161, 2100–2107.

Hall, S.M., Prochaska, J.J., 2009. Treatment of smokers with co-occurring disorders: emphasis on integration in mental health and addiction treatment settings. Ann. Rev. Clin. Psychol. 5, 409–431.

Hall, S.M., Reus, V.I., Munoz, R.F., Sees, K.L., Humfleet, G., Hartz, D.T., Frederick, S., Triffleman, E., 1998. Nortriptyline and cognitive–behavioral therapy in the treatment of cigarette smoking. Arch. Gen. Psychiatry 55, 683–690.

Heatherton, T., Kozlowski, L., Frecker, R., Fagerström, K., 1991. The Fagerström Test for Nicotine Dependence: a revision of the Fagerström Tolerance Questionnaire. Br. J. Addict. 86, 1119–1127.

Hughes, J.R., Keely, J.P., Niaura, R.S., Ossip-Klein, D.J., Richmond, R.L., Swan, G.E., 2003. Measures of abstinence in clinical trials: issues and recommendations. Nicotine Tob. Res. 5, 13–25.

Hurt, R.D., Offord, K.P., Croghan, I.T., Gomez-Dahl, L., Kottke, T.E., Morse, R.M., Melton, L.J., 1996. Mortality following inpatient addictions treatment. JAMA 275, 1097–1103.

Imel, Z.E., Wampold, B.E., Miller, S.D., Fleming, R.R., 2008. Distinctions without a difference: direct comparisons of psychotherapies for alcohol use disorders. Psychol. Addict. Behav. 22, 533–543.

Joseph, A., Lexau, B., Willenbring, M., Nugent, S., Nelson, D., 2004a. Factors associated with readiness to stop smoking among patients in treatment for alcohol use disorder. Am. J. Addict. 13, 405–417.

Joseph, A., Willenbring, M., Nugent, S., Nelson, D., 2004b. A randomized trial of concurrent versus delayed smoking intervention for patients in alcohol dependence treatment. J. Stud. Alcohol 65, 681–691.

Kalman, D., 1998. Smoking cessation treatment for substance misusers in early recovery: a review of the literature and recommendations for practice. Subst. Use Misuse 33, 2021–2047.

Kalman, D., Kahler, C., Garvey, A.J., Monti, P.M., 2006. High dose nicotine patch therapy for smokers with a past history of alcohol dependence: 36 week outcomes. J. Subst. Abuse Treat. 30, 213–217.

Kalman, D., Kim, S., DiGirolamo, G., Smelson, D., Ziedonis, D., 2009. Addressing tobacco use disorder in smokers in early remission from alcohol dependence: the case for integrating smoking cessation services in substance use disorder treatment programs. Clin. Psychol. Rev. 30, 12–24.

Kessler, R.C., McGonagle, K.A., Zhao, S., Nelson, C.B., Hughes, M., Eshleman, S., Wittchen, H.-U., Kendler, K.S., 1994. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States: results from the National Comorbidity Survey. Arch. Gen. Psychiatry 51, 8–19.

Kodl, M.M., Fu, S.S., Willenbring, M.L., Gravely, A., Nelson, D.B., Joseph, A.M., 2008. The impact of depressive symptoms on alcohol and cigarette consumption following treatment for alcohol and nicotine dependence. Alcohol Clin. Exp. Res. 32, 92–99.

Kozlowski, L.T., Jelinek, L.C., Pope, M.A., 1986. Cigarette smoking among alcohol abusers: a continuing and neglected problem. Can. J. Pub Health 77, 205–207.

Kranzler, H.R., Del Boca, F.K., Rounsaville, B.J., 1996. Comorbid psychiatric diagnosis predicts three-year outcomes in alcoholics: a posttreatment natural history study. J. Stud. Alcohol 57, 619–626.

Le, A.D., 2002. Effects of nicotine on alcohol consumption. Alcohol. Clin. Exp. Res. 26, 1915–1916.

McFall, M.E., Saxon, A.J., Thompson, C.E., Yoshimoto, D., Malte, C., Straits-Troster, K., Kanter, E., Zhou, X-H.A., Dougherty, C.M., Steele, B., 2005. Improving the rates of quitting smoking for veterans with posttraumatic stress disorder. Am. J. Psychiatry 162, 1311–1319.

McFall, M.E., Atkins, D.C., Yoshimoto, D., Thompson, C.E., Kanter, E., Malte, C., Saxon, A.J., 2006. Integrating tobacco cessation treatment into mental health care for patients with posttraumatic stress disorder. Am. J. Addict. 15, 336–344.

McFall, M., Saxon, A.J., Malte, C.A., Chow, B., Bailey, S., Baker, D.G., Beckham, J.C., Boardman, K.D., Carmody, T.P., Joseph, A.M., Smith, M.W., Shih, M.-C., Yu, Y., Holodniy, M., Lavori, P.W., 2010. Integrating tobacco cessation into mental health care for posttraumatic stress disorder: a randomized, controlled trial. JAMA 304, 2485–2493.

McFall, M., Saxon, A.J., Thaneemit-Chen, S., Smith, M.W., Joseph, A.M., Carmody, T.P., Beckham, J.C., Malte, C.A., Vertrees, J.E., Boardman, K.D., Lavori, P.W., 2007.

Integrating smoking cessation into mental health care for post-traumatic stress disorder. Clin. Trials 4, 178–189.
McKay, J.R., Van Horn, D.H.A., Oslin, D.W., Lynch, K.G., Ivey, M., Ward, K., Drapkin, M.L., Becher, J.R., Coviello, D.M., 2010. A randomized trial of extended telephone-based continuing care for alcohol dependence: within-treatment substance use outcomes. J. Consult Clin. Psychol. 78, 912–923.
McLellan, A.T., Cacciola, J.S., Alterman, A.I., Rikoon, S.H., Carise, D., 2006. The Addiction Severity Index at 25: origins, contributions and transitions. Am. J. Addict. 15, 113–124.
McLellan, A.T., Kushner, H., Metzger, D., Peters, R., Smith, I., Grissom, G., Pettinati, H., Argeriou, M., 1992. The fifth edition of the Addiction Severity Index. J. Subst. Abuse Treat. 9, 199–213.
McLellan, A.T., Luborsky, L., Cacciola, J., Griffith, J., Evans, F., Barr, H.L., O'Brien, C.P., 1985. New data from the Addiction Severity Index. Reliability and validity in three centers. J. Nerv. Ment. Disord. 173, 412–423.
McLellan, A.T., Luborsky, L., Woody, G.E., O'Brien, C.P., 1980. An improved diagnostic evaluation instrument for substance abuse patients. The Addiction Severity Index. J. Nerv. Ment. Disord. 168, 26–33.
Miller, N.S., Hoffmann, N.G., Ninonuevo, F., Astrachan, B.M., 1997. Lifetime diagnosis of major depression as a multivariate predictor of treatment outcome for inpatients with substance use disorders from abstinence-based programs. Ann. Clin. Psychiatry 9, 127–137.
National Institute of Alcohol Abuse Alcoholism, 1998. Alcohol and Tobacco. National Institute of Alcohol Abuse and Alcoholism (NIAAA), Rockville, MD.
Patten, C.A., 2002. Treating alcoholic smokers who have a history of depression. Alcohol. Clin. Exp. Res. 26, 1947–1949.
Payne, T., Smith, P.O., McCracken, L.M., McSherry, W.C., Antony, M.M., 1994. Assess nicotine dependence: a comparison of the Fagerström Tolerance Questionnaire (FTQ) with the Fagerström Test for Nicotine Dependence (FTND) in a clinical sample. Addict. Behav. 19, 307–317.
Pelucchi, C., Gallus, S., Garavello, W., Bosetti, C., La Vecchia, C., 2006. Cancer risk associated with alcohol and tobacco use: focus on upper aero-digestive tract and liver. Alcohol Res. Health 29, 193–198.
Prochaska, J.J., Delucchi, K., Hall, S.M., 2004. A meta-analysis of smoking cessation interventions with individuals in substance abuse treatment or recovery. J. Consult. Clin. Psychol. 72, 1144–1156.
Robins, L., Cottler, L., Bucholz, K., Compton, W., North, C., Rourke, K., 2000. Computerized Diagnostic Interview Schedule DSM-IV. C-DIS Management Group, Ottawa, Ontario, Canada.
Schneider, K.L., Hedeker, D., Bailey, K.C., Cook, J.W., Spring, B., 2010. A comment on analyzing addictive behaviors over time. Nicotine Tob. Res. 12, 445–448.
Sobell, L.C., Sobell, M.B., Agrawal, S., 2002. Self-change and dual recoveries among individuals with alcohol and tobacco problems: current knowledge and future directions. Alcohol. Clin. Exp. Res. 26, 1936–1938.
Steinberg, H.R., Hall, S., Rustin, T., 2004. Psychosocial therapies for tobacco dependence in mental health and other substance use populations. Psychiatr. Ann. 33, 470–478.
Thompson, R.S., Michnich, M.E., Friedlander, L., Gilson, B., Grothaus, L.C., Storer, B., 1988. Effectiveness of smoking cessation interventions integrated into primary care practice. Med. Care 26, 62–76.
Vallis, T.M., Shaw, B.F., Dobson, K.S., 1986. The cognitive therapy scale: psychometric properties. J. Consult. Clin. Psychol. 54, 381–385.
Wasserman, D.A., Stewart, A.L., Delucchi, K., 2001. Social support and abstinence from opiates and cocaine during opioid maintenance treatment. Drug Alcohol Depend. 65, 65–75.
West, R., 2007. The clinical significance of "small" effects of smoking cessation treatments. Addiction 102, 506–509.
World Health Organization, 1997. Composite International Diagnostic Interview (CIDI) Researcher's Manual. American Psychiatric Press, Washington, DC.