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## Assessing a smoking cessation program for veterans in substance use disorder treatment.

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Running Head: SUBSTANCE USE DISORDERS AND SMOKING CESSATION

ASSESSING A SMOKING CESSATION INTERVENTION FOR VETERANS IN  
SUBSTANCE USE DISORDER TREATMENT

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*In press, Addictive Disorders and Their Treatment*

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### Abstract

**Objectives:** This pilot study assessed the impact of a one-time motivationally based psychoeducational tobacco cessation intervention during substance use disorder treatment on use of subsequent smoking cessation services.

**Methods:** Participants were 89 veterans in substance use disorder treatment who attended the smoking cessation orientation group. Participants took part in a multimedia psychoeducational group designed to provide veterans education about and motivation to seek subsequent tobacco cessation services. Measures included a self-report survey of demographics, substance use, mental health, tobacco use and cessation, and attendance to tobacco cessation services.

**Results:** Results indicated that 86.5% of participants used tobacco and on average were heavily nicotine dependent. Fifty-seven percent of tobacco users utilized follow-up cessation services.

Logistic regression indicated that utilization of cessation services was associated with desiring to quit smoking for health purposes and personal choice, history of psychotic disorder, and previous use of nicotine replacement.

**Conclusions:** A one-time intervention with veterans in substance use disorder treatment can increase motivation to seek subsequent tobacco cessation services, providing an avenue for reducing tobacco use in this population.

**Key Words:** Tobacco Use; Substance Use Disorders; Smoking Cessation, Motivation, Mental Health

## Introduction

Cigarette smoking is the leading preventable cause of death and disease in the United States (1). Moreover, following two decades of steady declines in smoking prevalence, cessation rates have leveled off. Current thinking suggests that this plateau in cessation rates can be attributed to several subpopulations of recalcitrant adult smokers who have been unable to quit (2). Because these difficult to treat populations have failed to respond to current methods of tobacco dependence treatment, a critical direction for future research is to develop tailored interventions that address the unique needs of the more entrenched smoker (1).

Individuals with substance use disorders represent a subgroup of smokers that remains largely untouched by conventional tobacco control efforts. Prevalence of tobacco use among individuals with comorbid alcohol and/or illicit drug dependence is estimated to be at least three times higher than that in the general adult population, ranging anywhere from 74% and 88% (3,4). Compared to non-substance abusing populations, substance abusers tend to smoke more heavily, endorse more symptoms of nicotine dependence, experience more severe withdrawal symptoms, and have greater difficulty quitting smoking (4,5,6). Furthermore, substance abusers who smoke incur an additional disease burden above and beyond the health consequences of either tobacco use or drug/alcohol use alone, due to the synergistic effects of these agents on cardiovascular and cancer risks (1,7,8).

The observed disparities in tobacco use and its associated health consequences in this population underscore the need for targeted smoking cessation efforts. Residential substance abuse recovery programs offer the necessary administrative and clinical structure to support the effective implementation of tobacco cessation interventions. Moreover, tenets of substance abuse treatment, especially 12 step components, highlight the importance of identifying and recovering

from powerlessness over drugs, alcohol, and other substances. Continued neglect of tobacco cessation programming in substance use disorder treatment programs is inconsistent with an underlying treatment message of healthy living and abstinence from all drugs of abuse.

While tobacco cessation has been largely excluded from traditional alcohol and drug treatment models, a growing body of evidence supports concurrent treatment of these comorbid disorders. First, a significant proportion of substance abusers in treatment express an interest in tobacco cessation (9). Second, substance dependent individuals do not necessarily see tobacco cessation as a barrier to recovery from alcohol and substance addiction and do not think that it would harm recovery efforts (10). Third, evidence suggests that treatment of nicotine dependence is feasible in alcohol-dependent patients (11,12). Fourth, staff attitudes toward integrating smoking cessation services into treatment programs are enhanced when these services are an integral component of care (13). Fifth, continued smoking during alcohol treatment has been associated with less favorable treatment response (14,15). Finally, a recent meta-analysis of tobacco cessation studies with those in substance use disorder treatment suggests that smoking cessation during treatment and/or recovery does not jeopardize sobriety, and may even enhance alcohol and drug treatment outcomes (16).

As a result, formal tobacco cessation programming is being incorporated into substance use disorder treatment programs; however, the optimal parameters for implementing such interventions remain unclear. Interest in quitting, while certainly necessary, is unlikely to be sufficient given the unique barriers to smoking cessation associated with this population. In addition to the characteristic smoking profile of substance dependent individuals (e.g., heavily addicted, poor cessation history), substance abusers are more likely to have comorbid psychiatric diagnoses, cognitive deficits, greater perceived barriers, and lower self-efficacy for quitting, any

of which may derail cessation efforts (12,17,18). Many have noted the lack of clear factors associated with motivation and/or success in quitting smoking in this population (19,20), suggesting the need to continue to assess potential individual difference factors associated with seeking concurrent tobacco cessation services.

Efforts to develop smoking cessation interventions for this subgroup of smokers would do well to seek guidance from relevant theories of behavior change, including Miller & Rollnick's (21) Motivational Interviewing approach which emphasizes exploring and resolving ambivalence around change, Self Determination Theory (22) which suggests the importance of increasing intrinsic motivation and autonomy for behavior change, and other models such as the Health Belief Model (23) and Social Learning Theory (24) which suggest the importance of reducing perceived barriers and increasing self efficacy to behavior change. Exploring and resolving ambivalence, enhancing intrinsic motivation, addressing barriers to quitting smoking, and enhancing self-efficacy among recovering substance users all represent viable avenues for inclusion in brief tailored cessation interventions. Though use of brief motivational approaches for treatment of tobacco dependence in recovering substance users have yielded mixed results thus far in terms of smoking cessation outcomes (25,26,27), action-oriented intervention strategies that do not attend to increasing readiness and motivation may be inappropriately matched to patients who are still ambivalent about changing their behavior (28). Further, providers wishing to promote smoking cessation in this population may be more amenable to using a brief intervention strategy compared to a standard multi-session modality.

The primary aim of the current study was to evaluate the impact of a one-time, ninety-minute brief intervention designed to increase motivation for accessing tobacco cessation services among substance abusing veterans enrolled in a residential chemical dependence

treatment program. Given the lack of consistency in past studies of factors associated with motivation toward or success in quitting in this population, a secondary aim was to assess known barriers of cessation and relapse (i.e., weight concerns, depression) in order to establish their importance, or lack thereof, in this sample of substance abusing veterans.

## **Materials and Methods**

### *Participants*

Participants were 89 Veterans in the Addictive Disorders Treatment Program (ADTP) at a major regional VA Medical Center. The ADTP program is both inpatient and outpatient in nature and utilizes both a 12 Step Facilitation and Cognitive Behavioral orientation to assist veterans with substance use disorder diagnoses. Though the Medical Center is smoke free, veterans in the program are allowed to sign out to smoke outside the facility in a designated smoking shelter. All veterans in the program, regardless of smoking status, were required to attend the *Quitting It All* one-time 90 minute smoking cessation orientation which was offered monthly as part of routine clinical programming. Non-smokers were included in the program because of the typically high rates of comorbid smoking and substance use and research that suggests high rates of relapse to smoking in substance abusing populations (14).

### *Measures*

Smoking Status and History. A self report questionnaire was completed by participants that assessed demographics, current smoking behavior, smoking history, and substance abuse and mental health histories. Participants' past use of nicotine replacement therapy during a previous quit attempt was assessed and coded dichotomously. Among participants who made a quit attempt, reasons for quitting smoking were assessed, and for analytic purposes the two most frequently cited reasons, health concerns and personal choice (defined by the participant), were

dichotomized as “yes” or “no” responses as to whether the participant endorsed each reason. Mental health history was established via self report of participants by asking them to endorse and/or list conditions for which they have been treated (e.g., schizophrenia, anxiety). Those participants who indicated past schizophrenia or other psychotic disorder treatment were coded as such.

Weight Concerns. Participants were asked a series of 10 questions concerning the weight gain they would tolerate before relapse to smoking if they chose to quit smoking, from 0-2 lbs. to 20 or more lbs in two pound increments. Veterans who responded “yes” to intending to relapse at any weight were considered postcessation weight concerned. Participants were considered to have general weight concerns if they self-reported them on the questionnaire. This measure is face valid and has been used in multiple studies of smoking and weight and was included here given past studies suggesting reasonably high levels of cessation related and general weight concerns in smoking veterans (29,30).

Depression. Participants completed the Beck Depression Inventory, 2<sup>nd</sup> edition (BDI II; 31) upon entry into ADTP. The BDI II consists of 21 items to assess the intensity of depression in clinical and normal patients. Each item is a list of four statements arranged in increasing severity about a particular symptom of depression, and the measure has demonstrated adequate psychometric properties.

Subsequent Tobacco Cessation Services. Those participants who attended a scheduled group or individual tobacco cessation session, as evidenced by their electronic medical record, were considered to have sought subsequent tobacco cessation services. In instances in which attendance to a subsequent tobacco cessation session was unclear (e.g., did not sign in), that veteran was deemed *not* to have attended a session.



### *Intervention*

The Quitting It All intervention is a one time multimedia group intervention. The intervention was primarily PowerPoint driven, yet also included video clips, and the distribution of a workbook and relaxation tape.

The Intervention consisted of slides designed to explore ambivalence around quitting smoking, enhance intrinsic motivation, reduce perceived cessation barriers, and increase self efficacy to quit smoking. Lower levels of motivation to quit smoking were targeted via cognitive and experiential processes such as consciousness raising and self reevaluation and higher levels of motivation were targeted via behavioral and action oriented processes such as relaxation training. In addition, veterans were educated as to the evidence of the ability to cease both substance abuse and tobacco behaviors simultaneously, as well as the state of the art cessation program that combines cognitive behavioral treatment with adjunct pharmacotherapy.

The workbook distributed at the end of the program enabled veterans to continue addressing issues related to their smoking in a more individual manner. For example, the workbook included worksheets to calculate the financial costs of tobacco use, to assess personal costs and benefits of smoking and quitting smoking respectively, and to assess personal health consequences of smoking. Other workbook pages addressed the known benefits of quitting smoking, as well as a list of smoke free Alcohol Anonymous programs in the area.

### *Procedure*

Veterans attended the *Quitting It All* program as part of routine treatment schedule. During the group, attendees completed measures which were subsequently reviewed and coded, in order to obtain the necessary outcome data. Permission to use this clinical data for research

purposes was provided by both the VAMC Research and Development and Institutional Review Board committees via an approved protocol.

#### *Data Analysis Strategy*

Descriptive analyses were used to assess participant characteristics, smoking status, and subsequent tobacco cessation service attendance. Logistic regression was used to determine the correlates of subsequent tobacco cessation service attendance. Potential correlates assessed were post-cessation weight gain concerns, past use of nicotine replacement therapy, stated desire to quit for health reasons, stated desire to quit smoking for personal choice, cigarettes smoked per day, number of past quit attempts, BDI II scores, and history of treatment for a psychotic disorder.

### **Results**

#### *Participant Characteristics*

Of the 89 participants, 98% were male, and the average age was 49.7 years ( $SD = 8.0$ ). Seventy seven veterans were smokers (86.5%); the average number of cigarettes smoked per day was 23 ( $SD = 14.6$ ); the average number of past quit attempts was 2.1 ( $SD = 1.6$ ); the average number of years a smoker was 30.5 ( $SD = 10.2$ ); 30% reported a cardiac condition; 56% acknowledged general weight concerns; and 31% indicated smoking cessation related weight concerns.

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Insert Table 1 about here

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#### *Predictors of Utilization of Subsequent Cessation Services*

Data from nine participants were removed from subsequent analyses because of missing data. Of the smokers in the study, 39 (57.4%) attended a subsequent smoking cessation session and 29 (42.6%) did not. The overall model (see Table 2) proved significant,  $\chi^2(8) = 22.43$ ,  $p = .004$ , Nagelkerke  $R^2 = .38$ , and accurately predicted which participants attended follow-up appointments 75% of the time. Four independent variables were statistically significant: smokers reporting prior use of nicotine replacement therapy during past quit attempts were 5.6 times (C.I. 95% (1.29, 24.76)) more likely to attend the follow-up appointment than smokers who did not,  $B = 1.73$ ,  $Wald = 5.26$ ,  $p = .022$ ; smokers who reported wanting to quit due to personal choice were 6.5 times (C.I. 95% (0.99, 43.44)) more likely to attend the follow-up appointment than smokers who did not report wanting to quit smoking for personal choice,  $B = 1.88$ ,  $Wald = 3.78$ ,  $p = .052$ ; smokers who reported wanting to quit smoking for health reasons were 9.4 times (C.I. 95% (2.20, 40.30)) more likely to attend the follow-up appointment than smokers who did not report wanting to quit for health reasons,  $B = 2.24$ ,  $Wald = 9.14$ ,  $p = .003$ ; and smokers reporting a history of psychotic disorder treatment were 93.7% (C.I. 95% (.005, .856)) less likely to make a follow-up appointment than smokers not reporting psychotic disorders,  $B = -2.76$ ,  $Wald = 4.32$ ,  $p = .038$ .

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Insert Table 2 about here

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## **Discussion**

The results of this study indicate that a large portion of veterans in substance use disorder treatment are smokers (86.5%), and that utilization of subsequent cessation services following a one-time brief intervention was relatively high. High rates of smoking in those with comorbid substance use or dual diagnosis disorders are consistent with multiple other studies (25,32,33); however, subsequent service participation rates seem to be higher than rates seen in prior studies

of comorbid tobacco and substance use cessation (25,34). One likely explanation for such a finding is the use of a group specifically designed to motivate and educate those in substance use disorder treatment to access subsequent tobacco cessation treatment, rather than a recruitment procedure designed to enroll participants in a study.

The findings regarding characteristics associated with accessing subsequent services are likely helpful in future research studies and in the development of future cessation interventions targeting those in substance use disorder treatment. First, individuals who are concerned with the health consequences of smoking are more likely to attend subsequent services than those who report alternate reasons for wanting to quit smoking. These findings suggest that future research and interventions should focus on educating participants regarding improved health postcessation and encouraging participants to regard improved health as a major motivator. Whether researchers and clinicians use a motivationally based or health education based tobacco intervention, highlighting the health costs of smoking and the health benefits of quitting smoking are common to both types of intervention, though results indicating the importance of identifying personal choice as a reason for quitting smoking suggest personalizing costs and benefits, which is more common in motivationally based interventions.

A second area of interest in the development of future studies and interventions should consider prior use of nicotine replacement therapy (NRT) during past quit attempts, as seeking services were related to prior use of NRT. Past use of nicotine replacement signals high levels of desire and motivation to quit smoking, both of which are clearly related to future smoking cessation success (35).

Finally, this study also suggests that the presence of psychotic disorders may be a risk factor for non-use of subsequent tobacco cessation services. Certainly, just as those diagnosed

with comorbid nicotine dependence and substance use disorders demonstrate cessation successes without jeopardizing substance use relapse, most studies of individuals with comorbid psychiatric diagnoses also suggest that despite some exacerbation of psychiatric symptoms, cessation can be achieved with little adverse impact (36). As such, it may be that this subgroup of dually diagnosed smokers warrants more intensive motivational and educational interventions to promote seeking tobacco cessation services. One recent study found that motivational interviewing was significantly more effective than either psychoeducational counseling or advice-only in promoting utilization of subsequent tobacco cessation services in a dually diagnosed population (37). While the culture in substance use disorder treatment is beginning to recognize the need for adjunct smoking cessation treatment (Fuller et al., 2007), similar gains are not being seen by those who typically treat individuals with more severe forms of psychopathology (38).

Four particular limitations are noteworthy. First, because all veterans in the substance use disorder treatment program were required to attend the orientation, there is no control condition to compare rates of attendance to tobacco cessation service of those who did not attend the group. Second, because of the clinical nature of the ADTP program, participants' cessation motivation level pre-program and cessation status post-program were not attainable. Third, because the program was implemented at a VA medical center, generalizability may be limited. Fourth, the sample in this pilot type study was small. Despite these limitations, a number of well-defined characteristics were found to be associated with utilization of subsequent cessation services, information that may be of great utility to clinicians and researchers targeting tobacco cessation readiness in similar populations. Future studies in this area would benefit from the use of larger, more representative samples, longer follow-ups, and appropriate comparison groups.

Two particular strengths are noteworthy as well. Although the composition of the current sample can be seen as a limitation to the study, it is also one of its strengths. The veteran sample afforded investigators the opportunity to examine the characteristics and outcomes of a sample with a high percentage of comorbid nicotine dependence and substance use disorder diagnoses. In addition, despite thousands of tobacco cessation studies in the literature, few have targeted individuals receiving concurrent substance use disorder treatment.

Results of this study underscore the need for future larger scale studies of tobacco cessation service promotion in those diagnosed with comorbid substance use disorders and/or psychiatric comorbidities. In addition, clinicians working in environments suitable for tobacco cessation among those in substance use disorder treatment may find it helpful to take time to motivate and educate smokers to the benefits of seeking subsequent services, with the potential health consequences of smoking and benefits of quitting smoking highlighted as key motivators.

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Table 1: Participant Characteristics by Attending Follow-up Appointment

Independent Variables	Attended		Did not Attend		Total	
Post-cessation weight gain*						
No weight gain concerns†	25	(46.3%)	29	(53.7%)	54	(70.1%)
Weight gain concerns	9	(39.1%)	14	(60.9%)	23	(29.9%)
Past Use of Nicotine Replacement Therapy*						
No NRT†	20	(37.0%)	34	(63.0%)	54	(70.1%)
NRT	14	(60.9%)	9	(39.1%)	23	(29.9%)
Desire to Quit for Health reasons*						
No Health Reasons†	14	(33.3%)	28	(66.7%)	42	(54.5%)
Health Reasons	20	(57.1%)	15	(42.9%)	35	(45.5%)
Desire to Quit for Personal choice*						
No Personal Choice†	29	(45.3%)	35	(54.7%)	64	(83.1%)
Personal Choice	5	(38.5%)	8	(61.5%)	13	(16.9%)
Psychotic Disorders*						
No psychotic disorders	32	(48.5%)	34	(51.5%)	66	(85.7%)
Psychotic disorders†	2	(18.2%)	9	(81.8%)	11	(14.3%)
Other						
# of Cigarettes smoked daily‡	20.26	(11.32)	24.58	(16.65)	22.69	(14.63)
Past quit attempts‡	2.23	(1.61)	2.09	(1.57)	2.15	(1.57)
BDI-scores‡	19.94	(12.04)	21.5	(11.42)	20.81	(11.65)

Note: \* indicates dichotomous variables numbers outside parentheses are actual counts and numbers inside parentheses are percentages based on that level of the independent variable;

† indicates referent conditions in the logistic regression;

‡ Indicates continuous variables numbers outside parentheses are means and numbers inside parentheses are standard deviations

Table 2: Logistic Regression Model

Dependent Variables	Independent Variables	B	Odds ratio	95% C.I. for Odds Ratio
Attended a Follow-up Appointment				
	Post-cessation weight gain	.174	1.190	.332, 4.261
	Nicotine replacement therapy*	1.731	5.644	1.286, 24.762
	Health reasons*	2.242	9.416	2.200, 40.300
	Personal choice*	1.878	6.541	.985, 43.444
	Psychotic Disorders*	-2.764	.063	.005, .856
	# of Cigarettes smoked daily	-.027	.973	.921, 1.028
	Past quit attempts	-.090	.914	.614, 1.362
	BDI-scores	-.014	.986	.935, 1.041

Note: \*  $p \leq 0.05$