Regular articles

Barriers to Quitting Smoking Among Substance Dependent Patients Predict Smoking Cessation Treatment Outcome ☆

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ABSTRACT

For smokers with substance use disorders (SUD), perceived barriers to quitting smoking include concerns unique to effects on sobriety as well as usual concerns. We expanded our Barriers to Quitting Smoking in Substance Abuse Treatment (BQS-SAT) scale, added importance ratings, validated it, and then used the importance scores to predict smoking treatment response in smokers with substance use disorders (SUD) undergoing smoking treatment in residential treatment programs in two studies (n = 184 and 340). Both components (general barriers, weight concerns) were replicated with excellent internal consistency reliability. Construct validity was supported by significant correlations with pretreatment nicotine dependence, smoking variables, smoking self-efficacy, and expected effects of smoking. General barriers significantly predicted 1-month smoking abstinence, frequency and heaviness, and 3-month smoking frequency; weight concerns predicted 1-month smoking frequency. Implications involve addressing barriers with corrective information in smoking treatment for smokers with SUD.

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1. Introduction

Cigarette smoking among individuals with substance use disorders (SUD) occurs at more than three times the rate than in the general population (Hughes, 1996; Kalman et al., 2001). Among individuals currently receiving treatment for an SUD, smoking remains prevalent, with between 65 and 90% of patients self-reporting smoking (Guydish et al., 2011). Alcoholics are more likely to die from a smoking-related cause than from complications relating to alcohol (Hurt et al., 1996), so encouraging smoking cessation in this at-risk population is an important goal. SUD treatment provides a window of opportunity for smoking interventions. However, smokers with SUD find it difficult to quit and are often unsuccessful (Drobes, 2002; Rohsenow, 2015; Sobell, Sobell, & Agrawal, 2002).

Perceived barriers to quitting smoking exist for all smokers, including concern about withdrawal symptoms and inability to cope with negative emotions (Macnee & Talsma, 1995). In addition to these general barriers, individuals with SUD may have concern about effects of quitting smoking on SUD recovery. In an early exploration with alcohol-dependent

smokers, 70% reported that they were concerned that smoking cessation would negatively impact their sobriety, and the majority reported using smoking a way to cope with urges to drink (Monti, Rohsenow, Colby, & Abrams, 1995). While evidence shows that smoking cessation does not in fact increase substance relapse (Bobo, Gilchrist, Schilling, Noach, & Schinke, 1987; Burling, Burling, & Latini, 2001; Kalman et al., 2001; Sobell et al., 2002), the prevalence of these beliefs demonstrates that assessing barriers unique to substance abusers is important for increasing quit rates in this disproportionately affected population. Additionally, since continued smoking undermines long-term sobriety (Rohsenow, 2015; Weinberger, Platt, Jiang & Goodwin, 2015), these smokers need corrective information about this belief.

The first version of the Barriers to Quitting Smoking in Substance Abuse Treatment (BQS-SAT) was developed and administered to alcohol-dependent smokers in treatment (Asher et al., 2003). The measure contained 11 yes/no items related to different perceived barriers to smoking cessation (e.g., withdrawal, affective effects, etc.) and an open-ended item that asked participants to explain any other perceived barriers. Two of the items were specific to substance abuse ("If I quit smoking, my urge to drink/use drugs will be so strong I won't be able to stand it" and "Quitting smoking during substance abuse treatment would make it harder to stay sober"). This initial small study found that alcohol-dependent smokers who endorsed more barriers overall were more likely to be heavier smokers, more highly nicotine dependent, and report more smoking temptations, but not to have greater alcohol disorder severity. Two barriers concerning effects on sobriety, endorsed by almost half the smokers, were also not endorsed more by

smokers with greater alcohol disorder severity or heaviness of drinking pre-treatment. In sum, the yes/no version of the BQS-SAT showed promising initial validity for this population of alcohol-dependent smokers in treatment.

However, several improvements to this measure were needed, as well as a larger sample for psychometrics. First, many smokers in SUD treatment are being treated for SUDs other than or in addition to alcohol use disorders and we need to validate the measure with this broader population. Second, the perceived importance of the barriers could improve its clinical value so we added ratings of the perceived importance of each barrier. Third, based on open-ended responses in the earlier study, six items were added to the measure (see Table 1). Two of these items related to barriers specific to individuals in treatment for SUD. The remaining additional barriers included two items involving changes in eating and appetite, one item involving the presence of other people smoking, and one item regarding the difficulty of giving up the first cigarette of the day. Eating/Appetite items were added as research has suggested that increased caloric intake is common during smoking cessation (Klesges, Meyers, Klesges, & LaVasque, 1989) and concerns regarding post-cessation weight gain are associated with lower readiness and motivation to quit (Clark et al., 2004; Pomerleau, Zucker, & Stewart, 2001). The item involving the presence of other smokers was included as social networks appear important in smoking behavior and smoking cessation (Christakis & Fowler, 2008). Finally, the item regarding difficulty with giving up the first cigarette of the day was included based on Asher et al. (2003) and as speed of smoking the first cigarette reflects a pattern of heavy automatic smoking strongly predictive of relapse to smoking (Baker et al., 2007).

The aim of the present investigation was to validate the modified BQS-SAT among a large number of smokers with SUD in treatment and use it to predict response to smoking interventions, an aim not investigated with the earlier measure. We gave the measure pretreatment to two separate populations of smokers undergoing residential treatment for SUDs and enrolled in smoking cessation studies. In the first study, we explored the factor structure of the scale and validated it

against measures of nicotine dependence, smoking expectancies and motivation to quit (construct validation). In the second study, we replicated the factor structure and assessed the predictive validity of the importance scoring. A validated scale for measuring importance of barriers to cessation in the SUD population will be a useful tool for clinicians and researchers interested in increasing smoking cessation, as feedback derived from this measure can be incorporated into targeted interventions aimed at reducing smoking in this population.

2. Study 1: Development of the BQS-SAT

2.1. Material and Methods

2.1.1. Participants

Participants were 184 smokers with SUD in 28-day residential substance treatment participating in a larger study (Rohsenow et al., 2015) who had smoked 10 or more cigarettes per day for the past 6 months. As part of the larger study participants were enrolled in smoking counseling (4 sessions of brief advice or motivational interviewing with coping skills discussions) with half randomized to contingency management for smoking cessation (19 days), and half randomized to non-contingent payments. Exclusionary criteria included current use of any smoking cessation treatment or medication, and psychosis. Subjects did not need to be motivated to quit smoking to participate since the study was intended to motivate smokers who had not sought smoking cessation. Recruits were told that the study would provide "informational sessions about smoking" without requiring cessation and payments either for reduced smoking and then abstinence or just for providing breath samples for 19 days. After the 19-day voucher period, we provided free nicotine replacement for up to 8 weeks. The research procedures were approved by the Institutional Review Board of Brown University and informed consent was obtained.

Characteristics of the 184 participants are shown in Table 2. The majority of participants (83%) were White, 9% were Black, 8% were of other races, and 6.6% identified as Hispanic, consistent with the demographics of Rhode Island where this study was conducted. Mean legal income was $9,487 ± 13,619 in the past year and 10.9% were currently unemployed. The current substance diagnoses were: 71.2% alcohol use

Table 1
Principal Components Analysis Component Solution and Internal Consistency Reliability for the Barriers to Quitting Smoking in Substance Abuse Treatment (BQS-SAT).

Item	Study 1 loading	Study 2 loading
General barriers factor		
If I quit smoking my urges to smoke will be so strong I won't be able to stand it.	.76	.65
If I quit smoking, my urges to drink or use drugs will be so strong I won't be able to stand it.	.75	.74
Quitting smoking during sobriety would make it harder to stay sober.	.73	.68
I need to smoke to lift me up when I'm feeling down.	.68	.63
If I quit smoking I won't be able to sleep.	.67	.53
I smoke cigarettes to cope with my urges to drink or use drugs. *	.67	.61
When I don't smoke, I feel restless and I can't concentrate.	.66	.69
If I quit smoking, I'll feel tense and irritable.	.58	.69
It's too hard to quit smoking while I'm quitting other substances. *	.56	.62
I don't have the willpower to quit smoking.	.54	.62
Smoking gives me a lift when I'm feeling tired.	.54	.44
If I quit smoking, I would feel anxious.	.52	.57
I couldn't give up that first cigarette of the day. *	.42	.63
It's hard to quit because so many others around me are smoking. *	.42	.46
Coefficient alpha for general barriers factor	.89	.88
Weight concerns factor		
If I quit smoking I would eat more. *	.89	.92
If I quit smoking, I would gain weight.	.86	.93
If I quit smoking, I would feel hungry more often. *	.80	.88
Coefficient alpha for weight concerns factor	.87	.92

* Indicates new item added to BQS-SAT.

Table 2
Correlations of BQS-SAT factors scored for importance with discriminant, construct and concurrent validation variables in study 1 (n = 184).

Type of validity and validation measure	Measure	General barriers	Weight concerns
	M (SD)	r or t(df)	r or t(df)
Discriminant validity			
Mean age (years)	35.7 (8.1)	.18**	.19**
% White	83%	2.32 (182)*	1.96 (1.81)
% male	45%	2.39 (182)**	6.49 (1.81)**
% Married or cohabiting	11%	1.69 (182)	1.78 (1.82)
Education in years	12.0 (1.7)	−.01	−.02
Construct validity			
FTND	5.39 (2.29)	.35**	.15*
Cigarettes/Day prior treatment	23.58 (11.18)	.20**	.05
Concurrent validity			
Self-efficacy: Positive/Social	1.89 (.78)	−.40**	−.10
Self-efficacy: Negative affect	1.53 (.62)	.34**	−.17*
Self-efficacy: Habitual/Addictive	2.29 (.77)	−.48**	−.26**
Smoking Effects Questionnaire – Positive expectancy scale	2.99 (.99)	.47**	.35**
Smoking contemplation ladder	5.05 (1.41)	−.28**	−.05
Decisional balance – pros of smoking	3.18 (.87)	.58**	.30**
Drug Severity Index	.24 (.08)	.22**	.08

* p < .05.
** p < .01.