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## The implementation of tobacco-related brief interventions in substance abuse treatment: A national study of counselors

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### Abstract

The vast majority of individuals receiving substance abuse treatment also use tobacco, which suggests that smoking cessation is an important clinical target for most clients. Few studies have measured the extent to which addiction treatment counselors address clients' tobacco use. In this study, we examined counselors' implementation of brief interventions that are consistent with the US Public Health Service's clinical practice guideline, *Treating Tobacco Use and Dependence*, when counselors are engaging new clients in treatment. We hypothesized that counselors' implementation of tobacco-related brief interventions is associated with organizational and counselor-level factors. Data were collected from 2,067 counselors via mailed surveys. Implementation of recommended brief interventions during intake was significantly lower among counselors reporting greater barriers to smoking cessation services within their organizational context. Perceived managerial support for smoking cessation services was positively associated with implementation. Counselors with greater knowledge of the PHS guideline and who believed in the positive impact of smoking cessation interventions on sobriety reported greater implementation. Relative to counselors who have never been tobacco users, current tobacco users reported significantly lower implementation of these brief interventions. These findings suggest that attempts to increase the implementation of best practices in substance abuse treatment may require attention to organizational contexts and the individuals responsible for implementation.

### Keywords

implementation research; smoking cessation brief interventions; counselors

### 1. Introduction

Concurrent with the increasing momentum surrounding the implementation of evidence-based practices in substance abuse treatment, interest has grown in the integration of smoking cessation services within treatment facilities (Reid et al., 2007). Smoking cessation has been identified as an important clinical target during substance abuse treatment for several reasons

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(Baca & Yahne, 2009). Rates of smoking among individuals in substance abuse treatment are between 70% and 80%, which is nearly four times greater than the general US adult rate (Kalman et al., 2001; McCarthy, Collins, & Hser, 2002; Richter, Ahluwalia, Mosier, Nazir, & Ahluwalia, 2002; Williams & Ziedonis, 2004). Much of the risk of premature death faced by individuals treated for substance abuse is due to tobacco-related diseases rather than substance use (Hser, McCarthy, & Anglin, 1994; Hurt et al., 1996). Continued smoking after discharge from treatment has been identified as a risk factor for relapse (Lemon, Friedmann, & Stein, 2003; McCarthy et al., 2002), while smoking cessation is associated with reduced likelihood of relapse (Satre, Kohn, & Weisner, 2007).

If tobacco use is to be addressed during substance abuse treatment, it is necessary for treatment professionals to implement procedures to identify and engage clients in the process of smoking cessation. The Public Health Service (PHS) released a tobacco-related clinical practice guideline in 2000, and more recently published the *Treating Tobacco Use and Dependence: 2008 Update*. Both guidelines recommend the implementation, or routine use, of a set of brief interventions by all health professionals (Fiore et al., 2000; Fiore et al., 2008). These brief interventions include: asking patients about current and past tobacco use; advising tobacco users to quit; assessing whether patients are willing to attempt to quit; and using brief motivational interventions with patients who are unwilling to make a quit attempt.

To date, there have been relatively few attempts to examine the implementation of the PHS's clinical practice guideline by counselors within US substance abuse treatment organizations. Most surveys of treatment program staff attitudes and practices regarding smoking cessation were conducted in the 1990s before the release of the PHS guideline (Bobo & Davis, 1993; Bobo & Gilchrist, 1983; Gill, Bennett, Abu-Salha, & Fore-Arcand, 2000; Hahn, Warnick, & Plemmons, 1999; Hurt, Croghan, Offord, Eberman, & Morse, 1995; Knapp, Rosheim, Meister, & Kottke, 1993). Much of the recent health services research on smoking cessation has focused on the adoption of services at the organizational level rather than ascertaining how routinely clinicians engage in smoking cessation-related interventions as part of their usual practice (Friedmann, Jiang, & Richter, 2008; Fuller et al., 2007; McCool, Richter, & Choi, 2005; Richter, Choi, McCool, Harris, & Ahluwalia, 2004). These studies of adoption have focused on whether services are offered within a treatment organization, which is distinct from implementation, or how routinely an intervention is delivered by program staff (Klein, Conn, & Sorra, 2001).

In this research, we examine counselors' self-reported implementation of PHS guideline-consistent brief interventions with new patients who are entering treatment. Drawing on the larger literature on the implementation of innovations, we hypothesize that counselor-level implementation is associated with both organizational and individual factors. Specifically, counselor-level implementation may be influenced by their perceptions of the organizational context, such as perceived support for smoking cessation services by program managers. However, implementation may also reflect knowledge, beliefs, and personal smoking status of individual clinicians.

Organizational contexts, particularly in terms of norms within the organization, are often hypothesized to influence individual-level implementation behaviors (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005). The extent to which individuals perceive that the organizational culture supports and values an innovation may encourage more routine use of that innovation (Rogers, 2003). Similarly, if individuals perceive that the organizational context contains a variety of barriers to using an innovation, they may be less likely to implement it (Klein et al., 2001; Klein & Sorra, 1996).

Smoking cessation has traditionally been viewed as outside the purview of substance abuse treatment programs (Battjes, 1988; Campbell, Krumenacker, & Stark, 1998; Lemon et al., 2003). To some extent, the lack of integration of smoking cessation into addiction treatment may be driven by cultural beliefs about the perceived insignificance of nicotine dependence relative to other types of substance dependence (Hahn et al., 1999; Hurt et al., 1995; Kohn, Tsoh, & Weisner, 2003; Ziedonis, Guydish, Williams, Steinberg, & Foulds, 2006). Earlier studies of treatment counselors suggested that some counselors feared that smoking cessation would place clients at heightened risk of relapse (Bobo, McIlvain, Lando, Walker, & Leed-Kelly, 1998; Burling, Burling, & Latini, 2001). Recent clinical studies have actually shown that continued smoking after discharge from treatment increases the odds of relapse (Lemon et al., 2003; McCarthy et al., 2002; Satre et al., 2007), while nicotine dependence treatment reduces the likelihood of relapse (Prochaska, Delucchi, & Hall, 2004). These studies are relatively recent, so their findings may not have reached counselors in the field. Finally, in some treatment organizations, smoking is actually part of the staff culture, such that clinicians take smoke breaks together and may even smoke in the presence of clients (Ziedonis et al., 2006). However, some data suggest that clinicians may be becoming more supportive of smoking cessation (Gill et al., 2000; Hahn et al., 1999; Knapp et al., 1993), so organizational contexts may vary in terms of cultural norms related to smoking cessation.

Managerial support for an innovation has been identified as a key factor in achieving effective implementation (Fixsen et al., 2005; Klein et al., 2001). Unless managerial support is communicated to members of the organization, employees are likely to view an innovation as simply a passing fad and therefore, will use it less routinely (Klein & Knight, 2005). Thus, we would expect that greater implementation of intake procedures when counselors perceive that management is supportive of those endeavors.

While implementation may be associated with organizational context, there are also individual-level factors, such as knowledge about the PHS clinical practice guideline, personal beliefs about the connection between smoking cessation and recovery, and personal smoking status that may be associated with implementation. Given that these intake procedures are drawn from the PHS guideline (Fiore et al., 2008), knowledge about the guideline should enhance the ability of counselors to implement these practices. However, the classic work of Everett Rogers (2003) pointed to the importance of the fit between an innovation and the beliefs of those responsible for implementation. Rogers argued that implementation is more likely if an innovation is perceived to be consistent with one's beliefs. Thus, we would expect that counselors' own beliefs about whether smoking cessation interventions help or hinder recovery from substance abuse would be associated with their implementation of smoking cessation-related intake procedures.

Finally, whether counselors are tobacco users themselves may influence their implementation of these intake procedures. Earlier workforce surveys found that clinicians who smoke are less likely to encourage clients to quit smoking (Bobo & Gilchrist, 1983; Bobo, Slade, & Hoffman, 1995; Hahn et al., 1999). A recent review of the literature provided additional support for this association (Guydish, Passalacqua, Tajima, & Manser, 2007). These findings can again be explained by the theoretical argument made by Rogers (1995) about compatibility. Recommending that clients quit smoking would be inconsistent with counselors' own behaviors if they currently use tobacco.

Drawing on data collected from a national sample of 2,067 substance abuse treatment counselors, this research examines counselor-level implementation of PHS guideline-consistent brief interventions during the intake process. We estimate the relative importance of perceptions of organizational context and individual factors in a multivariate model of implementation.

## 2. Methods

### 2.1. Samples and Data Collection

This research draws on data collected via mailed questionnaires to substance abuse treatment counselors employed by three types of treatment organizations: publicly funded treatment programs, privately funded treatment programs, and therapeutic communities. These three samples were previously constructed as part of the National Treatment Center Study (NTCS). Thorough descriptions of the sampling procedures used in the NTCS have been published (Knudsen, Ducharme, & Roman, 2006, 2007), and we retained the categorization of the three samples for the current study. Program administrators of these treatment organizations were contacted by telephone about participating in an interview about smoking cessation services, and 85.2% of these interviews were completed.

At the conclusion of the interview, participating administrators were asked if they would provide a list of counselors' names so that the research team could send survey packets by mail to counselors at the treatment program's address. The mailed packet included a letter describing the study, informed consent forms, the survey, a postage-paid return envelope, and an honorarium payment form. Reminder postcards were mailed at two and four weeks after the initial mailing, and a second packet was mailed if counselors had not responded within six weeks. Counselors received \$20 for returning the questionnaire. In total, 3,835 counselors were mailed survey packets. Of these, 2,127 participated in the survey, yielding a response rate of 55.5%. All data for the present study, with the exception of the categorization of the three samples, were drawn from these counselor-level surveys. These research procedures were approved by the institutional review boards (IRBs) of the University of Georgia and the University of Kentucky.

### 2.2. Measures

The primary dependent variable of interest was counselors' self-reported *implementation of smoking cessation-related intake procedures*. This mean scale was constructed from items that asked counselors about how frequently they engaged in five brief interventions when meeting with new clients ( $\alpha = .85$ ). The wording for each item and the other tobacco-related measures appears in Table 1.

Five independent variables drawn from the counselor surveys were of primary interest in this research. First, seven items were combined into a mean scale measuring *organizational barriers to smoking cessation* ( $\alpha = .73$ ). Higher values on this scale indicated that counselors perceived the organizational context to be less supportive of the delivery of smoking cessation services. A single item measured counselors' perceptions about the extent of *managerial support for smoking cessation services*. Counselors also indicated the extent of their *knowledge about the Public Health Service's clinical practice guideline*. Similar to Hurt et al. (1995), counselors were asked about the *perceived impact of smoking cessation interventions on sobriety*. The final independent variable was *personal tobacco use*. Counselors were asked if they currently smoked, currently used smokeless tobacco products, formerly smoked, formerly used smokeless tobacco products, or have never smoked/used tobacco products. Three categories were constructed: current tobacco users, former tobacco users, and non-users (reference category).

A number of counselor characteristics were included as control variables in the analysis. Socio-demographic characteristics included *sex* (1 = female, 0 = male), *race/ethnicity* (African American, other race/ethnicity, and white as the reference category), and *age in years*. In addition, counselors were asked about their *educational attainment* (1 = master's degree or higher, 0 = less than master's degree), *licensure status* (1 = licensed addictions counselor, 0 =

not licensed), *certification status* (1 = certified addictions counselor, 0 = not certified), *personal recovery status* (1 = in recovery from substance abuse, 0 = not in recovery), and number of *years in the substance abuse treatment field*. Finally, counselors were categorized by *center type* (privately funded center, therapeutic community, and publicly funded center as the reference category) based on the pre-existing coding scheme from the NTCS.

### 2.3. Data Analysis

A model of counselor-level implementation of smoking cessation-related brief interventions during intake was estimated using linear regression in Stata 10.0. Prior to estimating the regression model, multiple imputation was utilized in order to address missing data on the covariates and mitigate some of the problems associated with listwise deletion (Allison, 2002). To be conservative, we excluded cases that had missing data on the dependent variable ( $n = 60$ ), yielding a dataset of 2,067 cases. Missing values for the covariates were imputed using “ice” in Stata 10.0 (Royston, 2005a, 2005b). This multiple imputation by chained equations (MICE) procedure imputes values from the posterior distribution of covariates and the dependent variable, and has been shown to be superior to other imputation procedures (Ambler, Omar, & Royston, 2007; Royston, 2005a, 2005b). Our use of “ice” yielded five imputed datasets. The “micombine” command was then used during model estimation in order to produce a single set of results based on pooling the estimates from the analyses of each of the five imputed datasets (Barnard & Rubin, 1999; Royston, 2004, 2005a, 2005b).

The methods used for identifying counselors for our survey produced a nested data structure, such that observations at the counselor-level were clustered within treatment organizations. In most cases there were several counselor respondents employed by the same center, which violated the assumption of independence between observations that is required for linear regression. We utilized the “cluster” command in Stata 10.0 (College Station, TX), which produces robust standard errors and a correction for the effects of data clustering (Long & Freese, 2003). This optional command allowed for the analysis to control for data clustering without having to invoke a multi-level modeling framework.

Given that the five tobacco-related covariates might result in problems of multicollinearity, we examined variance inflation factors (VIF) for the independent and control variables. The largest VIF was 1.62 for the categorical measure current tobacco use. This value was below the cutoff of 2.50 that is conventionally recommended (Allison, 1999), suggesting that multicollinearity was not a significant issue for the analysis.

## 3. Results

The majority of counselors were female (61.3%) and white (70.2%). About 18.7% of respondents identified as black/African American, and 11.1% were of Hispanic or other ethnic/racial background. The average counselor was 45.9 years of age ( $SD = 11.7$ ). In terms of educational attainment, about 42.5% held at least a master’s level degree. About 32.9% were licensed addictions counselors, and 59.4% were certified addictions counselors. Nearly half of the sample (48.4%) were personally in recovery from substance abuse, and the average counselor had worked about 10.1 years in the treatment field ( $SD = 8.0$ ). In terms of the types of treatment centers in which these counselors worked, about 40.7% worked in publicly funded centers, 35.0% worked in privately funded centers, and 24.3% worked in therapeutic communities.

Table 1 presents descriptive statistics for the tobacco-related measures. For the implementation of the brief interventions when meeting with a new client, asking about tobacco use was the most strongly endorsed intake procedure. The mean for this five-item scale was near the midpoint (mean = 2.69,  $SD = 1.46$ ), reflecting a moderate degree of implementation of these

brief interventions by responding counselors. In terms of organizational barriers to smoking cessation, the most strongly endorsed item was the measure reflecting the acceptability of smoking within the staff culture (mean = 2.35, SD = 1.89), while a lack of staff interest was the least endorsed barrier (mean = 1.69, SD = 1.61). Overall, there was a moderate degree of perceived managerial support for smoking cessation (mean = 2.50, SD = 1.79). Knowledge about the PHS guideline was low (mean = 1.26, SD = 1.57). Interestingly, most counselors (60.9%) perceived that delivering smoking cessation interventions would improve the likelihood that their clients achieved sobriety. About 23.1% indicated smoking cessation interventions would have no effect on clients' chances of achieving sobriety, and only 16.1% believed that smoking cessation interventions would have a negative impact. About one-fifth of counselors reported being current tobacco users, and nearly half were former tobacco users.

The multivariate model of implementation of smoking cessation-related intake procedures appears in Table 2. Notably, all five tobacco-related measures were statistically significant in this multivariate model. There was a significant negative association for organizational barriers to smoking cessation, such that counselors who perceived greater organizational barriers engaged in less routine implementation of the cessation-related brief interventions. Perceived managerial support for smoking cessation services, however, was positively associated with implementation. Knowledge of the PHS guideline was positively associated with implementation. Counselors who believed that smoking cessation interventions would have a positive impact on recovery reported greater implementation. Finally, personal tobacco use was associated with implementation, such that current tobacco users reported lower implementation than non-users. The difference between former tobacco users and non-users was not statistically significant.

Of the five tobacco-related measures, knowledge of the PHS guideline had the strongest association with implementation of tobacco-related brief interventions. The next largest association was for perceived managerial support. The associations for current tobacco use, belief about the impact of smoking cessation on sobriety, and organizational barriers to smoking cessation were similar in size and about half the magnitude of the association for PHS guideline knowledge. Overall, the model explained about one-quarter of the variance in the implementation of tobacco-related brief interventions ( $R^2 = .26$ ).

#### 4. Discussion

This research, drawing on data from a large national sample of counselors working in addiction treatment organizations, adds to the growing literature on the implementation of innovations in healthcare settings. Specifically, we found that the implementation of smoking cessation-related intake procedures by counselors was associated with a mixture of organizational and individual-level factors. Consistent with the broader literature on implementation (Fixsen et al., 2005; Klein & Knight, 2005), perceptions of managerial support for smoking cessation were associated with implementation. This finding suggests that efforts to implement evidence-based practices might be enhanced by not only focusing on clinical staff but also attempting to build "buy-in" and support among top managers. In addition, our results suggest that perceived organizational barriers in terms of the culture and context were associated with lower implementation.

However, these data also point to the importance of individual knowledge and beliefs on the implementation of smoking cessation interventions in substance abuse treatment. Knowledge about the PHS guideline was positively associated with implementation, suggesting that there may be value in continued efforts to raise awareness about the recently updated guideline and to disseminate its findings. Although knowledge was positively associated with implementation, the average counselor reported only a modest familiarity with the guideline.

Implementation was also greater when counselors believed that smoking cessation interventions would benefit clients' overall progress towards sobriety and recovery. Previous studies have often attributed fears about smoking cessation promoting relapse as a barrier to integrating smoking cessation services into drug treatment centers (Bobo et al., 1998; Burling et al., 2001; Ziedonis et al., 2006), and our findings are consistent with previous research. We also found that most responding counselors reported that smoking cessation would have a positive benefit in terms of overall recovery, which was an important finding given that this attitudinal item was associated with implementation.

This research reiterates the relevance of personal tobacco use in the delivery of smoking cessation interventions, which has been previously identified as a barrier to the integration of such services within addiction treatment settings (Guydish et al., 2007; Ziedonis et al., 2006). Even after controlling for organizational context, knowledge about the PHS guideline, and personal beliefs about the impact of smoking cessation on recovery, counselors' current use of tobacco was associated with how routinely they implemented these guideline-consistent intake procedures.

It was perhaps heartening to discover that the rate of current tobacco use among responding counselors was not dramatically higher than the general adult population. Only a minority of responding counselors were current tobacco users. The rate of former tobacco use among respondents, however, was quite high. Additional analyses suggest that the high rate of former use partly reflected the substantial percentage of counselors who were personally in recovery. Consistent with the literature that the vast majority of individuals with substance abuse diagnoses also smoke (Kalman et al., 2001; McCarthy et al., 2002; Richter et al., 2002), 89.0% of recovering counselors were current or former tobacco users. In contrast, less than half of non-recovering counselors (48.9%) were current or former tobacco users, a rate closer to the 42% of the general US population who were current or former smokers as of 2007 (Centers for Disease Control and Prevention, 2008). Caution is warranted in attempting to generalize the rate of tobacco use from this survey to the larger treatment field given our response rate.

As with any research, this study has a variety of limitations that must be noted. First, these are cross-sectional data, so causality cannot be established. Second, all data were collected via self-report, which may result in errors due to over- or under-reporting. Direct observation of counseling sessions may result in more accurate measures of implementation, but this approach would be intrusive in a clinical setting and highly costly. It is perhaps some consolation that the data do not show signs of extreme positive skew, which assuage some concerns about over-reporting.

Other types of response bias are also possible. We used multiple imputation as a method for addressing item-level non-response, but that approach cannot address non-response to the survey itself. Our response rate of 55% was slightly lower than in our previous surveys of counselors where we achieved response rates around 60% (Knudsen et al., 2006; Knudsen, Johnson, & Roman, 2003). In part, the lower rate of response may reflect a smaller incentive for participation in this study. We reduced the incentive to \$20 because this was a much shorter survey, but that may have impacted the response rate. One potential form of non-response that could be particularly problematic is if current tobacco users were less likely to respond to the survey. While we cannot fully ascertain whether this was the case, we did compare the rate of current tobacco use as reported by counselors to administrators' estimates regarding the percentage of clinical staff who smoke. Interestingly, administrators estimated on average that about 21.5% of their clinical staff currently smoke, which is virtually identical to the rate of current tobacco use reported by counselors who responded to our survey.

A final limitation that should be noted is that this analysis focuses on one part of the PHS guideline by considering how counselors address smoking when they meet new patients. These intake procedures are an important first step in the larger process of smoking cessation, which may include more intensive counseling interventions and medications. Future research related to this project will examine in more depth the extent to which counselors deliver more intensive smoking cessation interventions in ongoing individual and group sessions with clients.

Individuals who receive substance abuse treatment are more likely to die from tobacco-related diseases than from the effects of alcohol or other drugs (Hser et al., 1994; Hurt et al., 1996), which points to the importance of substance abuse treatment facilities as sites for delivering smoking cessation services. Our study suggests that a substantial proportion of counselors are routinely engaging in intake procedures that identify and engage clients in smoking cessation. In addition, this study adds to the growing literature on the implementation of innovations, highlighting the importance of organizational context as well as individual knowledge and beliefs in the implementation process.

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Table 1

Descriptive statistics for counselors' implementation of brief interventions during intake and other tobacco-related measures

Measure	Mean (SD) or %	Available N
<i>Implementation of brief interventions during intake</i>		
Thinking about when you first meet a new client, how often (0 = never, 5 = always) do you:		
...make sure to <u>ask</u> whether they are a current smoker and/or current tobacco user?	3.50 (1.86)	2,067
... <u>ask</u> non-smokers if they have <u>ever</u> been a smoker/tobacco user?	2.61 (1.94)	2,067
... <u>advise</u> current smokers/tobacco users that they should quit?	2.54 (1.83)	2,067
... <u>assess</u> current smokers/tobacco users for their willingness to quit?	2.65 (1.82)	2,067
...use brief motivational interventions to <u>increase</u> willingness to quit?	2.16 (1.79)	2,067
Mean scale	2.69 (1.46)	2,067
<i>Organizational barriers to smoking cessation</i>		
To what extent (0 = not at all true, 5 = very true) are the following true about the center where you work?		
Smoking is an accepted part of the staff culture at this treatment program.	2.35 (1.89)	2,047
Smoking and tobacco use are not important issues in the successful treatment of other substance abuse problems.	2.11 (1.70)	2,039
Our treatment protocol is so demanding that there would be little or no time for adding smoking cessation activities.	1.78 (1.64)	2,030
Allowing clients to continue their smoking or other tobacco use facilitates successful treatment of their primary substance abuse issues.	2.02 (1.61)	2,034
It is very difficult to be reimbursed for staff time devoted to clients' smoking cessation.	1.96 (1.86)	1,994
Our staff generally does not have the <u>skills</u> to provide smoking cessation treatments to clients.	1.96 (1.75)	2,039
Our staff does not have <u>interest</u> in providing our clients with smoking cessation treatments.	1.69 (1.61)	2,041
Mean scale	1.97 (1.06)	1,954
<i>Perceived managerial support for smoking cessation</i>		
To what extent (0 = no extent, 5 = very great extent) does the management at your center support the integration of smoking cessation services into substance abuse treatment?	2.50 (1.79)	2,015
<i>PHS guideline knowledge</i>		
To what extent (0 = no extent, 5 = very great extent) are you knowledgeable about the Public Health Service's clinical practice guideline entitled, <i>Treatment Tobacco Use and Dependence</i> ?	1.26 (1.57)	2,035
<i>Perceived impact of smoking cessation interventions on sobriety</i>		
How do you feel providing smoking cessation interventions will affect a smoking patient's success (at 1 year follow-up) on their alcohol/non-nicotine drug abuse problem?		
...Definitely decrease chances for sobriety (coded 1)	2.4%	49

Measure	Mean (SD) or %	Available N
...Probably decrease chances for sobriety (coded 2)	13.7%	278
...Have no effect (coded 3)	23.1%	469
...Probably increase chances for sobriety (coded 4)	44.4%	903
...Definitely increase chances for sobriety (coded 5)	16.5%	335
Mean perceived impact	3.59 (0.99)	2,034
<i>Personal tobacco use</i>		
Current smoker/user of smokeless tobacco products	20.4%	410
Former smoker/user of smokeless tobacco products	47.9%	963
Never smoker/never tobacco user	31.8%	639

**Table 2**

Linear regression model of implementation of smoking cessation-related brief interventions during intake

	<b>b (SE)</b>	<b>β</b>
Organizational barriers to smoking cessation	-.172 (.032)***	-.125
Perceived managerial support for smoking cessation	.140 (.021)***	.171
PHS guideline knowledge	.243 (.019)***	.260
Perceived impact of smoking cessation interventions on sobriety	.202 (.031)***	.137
Personal tobacco use		
Current smoker/tobacco user	-.479 (.093)***	-.132
Former smoker/tobacco user	-.068 (.077)	-.023
Never smoker/tobacco user	Reference	Reference
Female	.082 (.057)	.027
Race/ethnicity		
White	Reference	Reference
African American	-.240 (.096)*	-.064
Other	-.121 (.097)	-.036
Age	-.005 (.003)	-.036
Master's-level degree or higher	.003 (.072)	.001
Licensed addictions counselor	.120 (.067)	.038
Certified addictions counselor	-.001 (.073)	-.000
Personally in recovery	-.019 (.072)	-.007
Years in the substance abuse treatment field	.009 (.005)	.050
Center type		
Publicly funded center	Reference	Reference
Privately funded center	.142 (.086)	.046
Therapeutic community	.027 (.099)	.008
Constant	1.817 (.209)	
Adjusted R <sup>2</sup>	.256	

\*  
p < .05,\*\*\*  
p < .001 (two-tailed test)