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Structural and cultural barriers to the adoption of smoking cessation services in addiction treatment organizations

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Abstract

Few studies have examined associations between availability of smoking cessation services in addiction treatment organizations and specific cultural, staffing, and resource barriers. Telephone interviews were conducted with administrators of 866 addiction treatment organizations in the U.S. These data revealed that few programs had adopted the full bundle of five recommended tobacco-related intake procedures and that less than half of programs offered any smoking cessation services. Barriers to adoption of the intake bundle and availability of services included organizational culture and low levels of staff skills. Adoption of cessation services was associated with center type, location in a hospital setting, levels of care, and organizational size. Although a substantial proportion of organizations offer smoking cessation services, expansion of these services and greater adoption of tobacco-related intake procedures is needed to address the needs of nicotine-dependent individuals in addiction treatment.

Keywords

Smoking cessation; addiction treatment organizations; health services research

INTRODUCTION

As part of a large scale US national effort to eradicate tobacco use, interest has crystallized in using specialty substance abuse treatment as a platform for the treatment of nicotine dependence.^{1, 2} In part, this interest is driven by the high rate tobacco use and tobacco-related health consequences identified within this population. Rates of tobacco use between 70% and 80% have been repeatedly documented among individuals in treatment, which is three to four times greater than the general adult rate of smoking.³⁻⁶ Longitudinal research has documented that many premature deaths among individuals treated for substance abuse are due to tobacco-related diseases.^{7, 8}

There is also growing evidence that tobacco use may impact substance abuse treatment outcomes. Continued smoking by individuals after treatment is associated with greater risk of substance use relapse,^{4, 9} while quitting smoking reduces the likelihood of relapse.¹⁰ A meta-analysis of smoking cessation interventions delivered during substance abuse treatment

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found that such services increased the likelihood of abstinence from alcohol and drugs,¹¹ although one recent study found conflicting results for alcohol dependent patients.¹²

Addressing tobacco use during substance abuse treatment, however, means that addiction treatment organizations need to adopt procedures that identify and engage clients in smoking cessation. Adoption refers to the organizational decision to offer a particular service or use a given practice. The Public Health Service's clinical practice guideline, *Treating Tobacco Use and Dependence: 2008 Update*, describes a set of brief interventions that are recommended for adoption in healthcare settings.¹³ These brief interventions: asking all patients about tobacco use; advising all tobacco users to quit; assessing whether patients are willing to attempt to quit; developing a quit plan with those willing to quit; and using motivational interventions with those who are unwilling to make a quit attempt. In addiction treatment organizations, adoption of all five of these brief interventions as part of the intake process indicates that organizational commitment to promoting smoking cessation as a treatment goal.

It is also important that treatment programs offer specific smoking cessation services. Organizational adoption of these services is critical for clients' access, since referrals to outside providers of needed ancillary services results in disappointing rates of utilization.¹⁴ Smoking cessation services may include formal psychosocial counseling and pharmacotherapies.¹³ Formal counseling includes individual or group sessions specifically focused on smoking cessation, rather than ad-hoc approaches where counselors only sporadically address tobacco-related issues "as they come up" in treatment sessions. Approved medications include nicotine replacement therapies (NRT), sustained-release bupropion hydrochloride (e.g. Zyban®), and varenicline (e.g. Chantix®).¹³

Based on the availability of counseling services and medications, organizations can be assigned to a typology of smoking cessation services: not offering any services, offering a formal program of cessation-focused counseling without medications, providing medications without a formal counseling program, or delivering comprehensive services that include both pharmacotherapy and a formal counseling program.¹⁵ The combination of counseling with pharmacotherapy for treating nicotine dependence is included in the National Institute on Drug Abuse's guideline about effective treatment practices.¹⁶

Available data on the adoption of smoking cessation-related services by addiction treatment organizations have several limitations.¹⁷ Studies reporting rates of adoption of smoking cessation services in the U.S. have relied on data collected from a single treatment modality,^{15, 18, 19} single states,^{20, 21} or non-random samples.²² There are no published data that are nationally representative and inclusive of multiple addiction treatment modalities.

Prior studies about smoking cessation service delivery are hampered by two additional weaknesses. First, some studies have focused on structural characteristics of treatment organizations, such as ownership, profit status, accreditation, size, and levels of care.^{18, 22} This limited focus on structural characteristics without considering specific cultural, staffing, and financial barriers likely reflects the limitations of secondary data analysis.^{18, 22} While examining structural characteristics may identify where smoking cessation services are more likely to be delivered, these organizational dimensions that are rarely amenable to change.

A second limitation of prior studies is their presentation of descriptive information about perceived barriers to smoking cessation rather than modeling the associations between barriers and actual service delivery.¹⁹⁻²¹ Although descriptive data are useful starting points, it precludes assessment of the relative significance of different types of barriers to actual adoption.

Recent literature has summarized possible barriers to smoking cessation services adoption that might be included in multivariate models.^{17, 23} In some treatment organizations, smoking is an institutionalized part of staff culture. Workforce surveys have found that clinical staff members who smoke are less likely to encourage clients to quit smoking.^{20, 24, 25} Further, staff may perceive that given limited time for treatment, smoking is unimportant relative to alcohol and other drug abuse.^{19, 20, 23} Some clinicians may perceive that quitting smoking jeopardizes the likelihood of treatment success and simply lack interest in delivering smoking cessation counseling. Beyond these cultural barriers, there may also be resource-related barriers, such as lack of training in smoking cessation interventions^{15, 26} and perceived difficulties in being reimbursed for delivering these services.²¹

Few studies have included organizational barriers in multivariate models of adoption. There are two notable exceptions. Richter and colleagues reported that methadone programs with staff trained in nicotine dependence treatment were more likely to offer comprehensive smoking cessation services.¹⁵ Having at least one staff member with a strong interest in treating nicotine dependence was also positively associated with adoption of comprehensive services. A study by Fuller and colleagues of adoption in programs affiliated with the National Institute on Drug Abuse's Clinical Trials Network included a program-level measure of whether clinicians believed that smoking cessation should be integrated into substance abuse treatment.²² Endorsement of this belief was positively associated with the odds that programs offered any smoking cessation services.

In this study, the adoption of intake procedures related to tobacco use and smoking cessation services is measured in three large national samples of treatment programs. Data on the extent to which these treatment programs endorse seven organizational barriers to smoking cessation services are presented. Finally, models of adoption that include specific organizational barriers to adoption and structural characteristics are estimated.

METHODS

Samples and Data Collection

Data were collected via telephone interviews with administrators of substance abuse treatment programs across the United States. These interviews focused on adoption of smoking cessation-related interventions and perceived barriers to these services. Programs were drawn from three nationally representative samples of facilities that had previously participated the National Treatment Center Study (NTCS). The three samples consisted of privately funded treatment organizations (n = 403), publicly funded treatment organizations (n = 363), and therapeutic communities (n = 379).

These samples were originally constructed between 2002 and 2004 using a two-stage random sampling strategy that initially sampled at the level of counties and then randomly selected facilities within those sampled counties were screened by telephone for eligibility. In all three samples, programs were required to offer a level of care at least equivalent to structured outpatient programming as defined by the American Society of Addiction Medicine patient placement criteria.²⁷ Counselors in private practice, detoxification-only programs, and facilities offering exclusively methadone maintenance services were excluded. Programs were required to be open to the general public which excluded Veterans Administration and correctional facilities. Privately funded treatment organizations were defined as those receiving less than 50% of their annual operating revenues from government block grants and contracts. Publicly funded treatment programs were defined as those receiving at least 50% of their annual operating revenues from Federal, state or local grants or contracts. Any sampled program that self-identified as a therapeutic community was placed in this third sample, regardless of its mixture of funding sources. Additional

details related to sampling in the NTCS have been previously published.^{28, 29} Face-to-face interviews were conducted, with participation rates of 88% for private centers, 80% for public centers, and 86% for therapeutic communities. These face-to-face interviews were the source of the structural characteristics included in the present study.

These 1,145 treatment organizations were re-contacted and asked to participate in a telephone interview about smoking cessation services. Of these, 92 organizations had ceased operations or no longer offered any substance abuse treatment services. Among the 1,053 organizations that remained open, 53 administrators (5.0%) refused to participate in the telephone interview and 103 administrators (9.8%) were unable to be interviewed after repeated attempts. Telephone interviews were conducted with 897 administrators, including 321 privately funded centers, 299 publicly funded centers, and 277 therapeutic communities, between September 2006 and January 2008 (response rate = 85.2%). Participating treatment organizations received U.S. \$25. These research procedures were approved by the Institutional Review Boards of the University of Georgia and the University of Kentucky.

Measures

The first dependent variable of interest was adoption of a bundle of five recommended brief interventions related to tobacco use as part of the program's intake process. These five intake procedures are described in Table 2. Programs were coded for whether they had adopted the "bundle" of all five intake procedures (1 = adopted all five intake procedures; 0 = adopted less than five intake procedures).

The second dependent variable was a typology of smoking cessation services that was based on a series of questions. First, administrators were asked if their organization offered a formal smoking cessation program that included individual and/or group counseling sessions dedicated to smoking cessation. Reports that clinicians used their own discretion in offering counseling related to tobacco use were not accepted as an indicator of a formal program. Administrators were asked if any cessation-related medications were offered by the program, and if so, which specific medications had been adopted (e.g. NRT, bupropion-SR, and/or varenicline). Programs were coded into four mutually exclusive categories: formal smoking cessation program without pharmacotherapy, pharmacotherapy-only services, comprehensive program of counseling and pharmacotherapy, or no services (reference category).

Seven organization-level barriers to smoking cessation and a measure of staff smoking were included in this analysis (Table 3). Administrators were asked to use a six-point Likert scale (0 = not at all true, 5 = very true) to rate the extent to which these statements were true about their treatment center. They also reported the percentage of clinical staff members who were current smokers or tobacco users.

Six structural characteristics were extracted from the earlier face-to-face interviews. Organizational type was used to compare the three samples, with privately funded programs serving as the reference category. Ownership (1 = government-owned, 0 = privately-owned) and profit status (1 = for-profit, 0 = non-profit) were dichotomous measures. Organizational affiliation divided programs into those that were hospital-based, located within a community mental health center, or freestanding (reference category). The measure of levels of care categorized organizations into those that only offered inpatient and/or residential services, a mixture of inpatient/residential and outpatient services, or outpatient-only services (reference category). Finally, administrators reported the number of full-time equivalent (FTE) employees, which was natural log-transformed in order to correct its skewed distribution.

Data Analysis

Logistic regression was used to model the adoption of the bundle of intake procedures, and multinomial logistic regression was employed for the typology of smoking cessation services.^{30, 31} Potential multicollinearity among the organizational barriers and structural characteristics was assessed using procedures described by Allison.³² There was no evidence of multicollinearity between these measures. (Results are available by request.)

For both models, multiple imputation was utilized to mitigate some of the problems associated with using listwise deletion.³³ To be conservative, we excluded 33 cases that had missing data on either or both of the two dependent variables, resulting in a dataset of 864 cases. Missing values on the covariates were imputed using “ice” in Stata 10.0, yielding five datasets.^{34, 35} This multiple imputation by chained equations (MICE) procedure imputes values from the posterior distribution of covariates and dependent variable,^{34, 35} and has been shown to be superior to other imputation procedures.³⁶ The “micombine” command was used to produce a single set of results that pooled the estimates from the analyses of each imputed dataset.^{34, 35, 37}

RESULTS

Descriptive Statistics

Table 1 presents descriptive statistics of the structural characteristics for all treatment programs as well as the three types of treatment facilities. All descriptive statistics in Tables 1 and 2 are based on the observed data rather than the imputed datasets. There were considerable differences between the three samples on these measures of structural characteristics, reflecting the uniqueness of each sample.

Descriptive statistics for the smoking-related measures appear in Table 2. The most widely adopted intake procedure was asking clients if they are current smokers (85.8%). Rates of adoption for the other intake procedures were considerably lower, with less than half of programs advising clients to quit and assessing willingness to quit. About one-third of programs reported that they developed tobacco-related quit plans with clients who were willing to make a quit attempt. The least frequently adopted intake procedure was the use of motivational techniques to increase willingness to quit. Just 14.7% of programs indicated that they used all five procedures as part of client intake.

There was some evidence of differences in adoption of specific intake procedures by center type. Privately funded centers were more likely than publicly funded programs to ask clients about current smoking and to advise current tobacco users to quit. In addition, privately funded programs were more likely than therapeutic communities to ask about smoking, advise quitting, assess willingness to quit, and develop quit plans. Despite some variability in the adoption of specific intake procedures by center type, the three samples did not differ in terms of adoption of the intake bundle.

The majority of programs did not offer smoking cessation services. The adoption of pharmacotherapy without a formal counseling program was the most common of the three types of services. Adoption of comprehensive services, meaning a formal counseling program with at least one pharmacotherapy (e.g. NRT, bupropion-SR, and/or varenicline), was less common. Relatively few programs offered a formal counseling-only program.

There was variation in the adoption of smoking cessation services by center type. Publicly funded centers and therapeutic communities were much more likely than private centers to be classified as offering no formal services. In large part, the difference in adoption was driven by the much higher rate of pharmacotherapy-only services offered by privately

funded centers. Also, privately funded centers were significantly more likely than the other two types of centers to have adopted a formal program with pharmacotherapy.

There was moderate endorsement of the organizational barriers to smoking cessation in the combined sample. None of the items had mean ratings that exceeded the midpoint of the six-point Likert response scale. The most strongly endorsed barrier was related to difficulty in receiving reimbursement for staff time dedicated to delivering smoking cessation services. The least strongly endorsed barrier was a lack of time to add smoking cessation to existing treatment protocols.

For three of the organizational barriers, there were significant differences by center type. First, therapeutic communities reported stronger endorsement of smoking as a part of staff culture than private centers and public centers. Therapeutic communities were also more likely than private centers to indicate that staff lacked the skills to provide smoking cessation services. Finally, private centers more strongly endorsed the barrier related to reimbursement than therapeutic communities.

Logistic Regression Model of Adoption of the Bundle of Intake Procedures

A multivariate logistic regression model was estimated to examine whether the seven organizational barriers and six structural characteristics were associated with the adoption of the bundle of tobacco-related brief interventions as part of the intake process (Table 4). Consistent with the bivariate results presented in Table 1, there were no significant differences in adoption by center type. Two of the organizational barriers were statistically significant. First, the perceived lack of importance of smoking in the treatment of substance abuse was negatively associated with the adoption of the intake bundle. The odds of adoption of the bundle were significantly lower in programs that more strongly endorsed the statement that staff lacked the skills to provide smoking cessation treatment. None of the structural characteristics were associated with adoption of the bundle of smoking-related intake procedures.

Multinomial Logistic Regression Model of Smoking Cessation Services

Table 5 presents the multinomial logistic regression model of the typology of smoking cessation services. The first column presents the odds ratios for the comparison of the likelihood of adoption of a formal counseling program without medications to the reference category of not offering any smoking cessation services. Three variables were statistically significant. The cultural norm that allowing clients to continue using tobacco facilitates successful substance abuse treatment was a significant organizational barrier to the adoption of a formal counseling-based program. Lack of staff skills was also a significant barrier to adoption of a formal program. The only significant structural characteristic was government ownership. The odds of adopting a formal program were 2.8 times greater in government-owned programs relative to the odds of adoption in privately-owned treatment organizations.

The second column of Table 5 presents the odds ratios for the adoption of pharmacotherapy-only smoking cessation services relative to the odds of offering no services. None of the organizational barriers were statistically significant. There was a positive association between the adoption of the bundle of intake procedures and adoption of medication-only smoking cessation services. Consistent with the bivariate results in Table 2, there were substantial differences by center type. The odds of adoption of medications-only were 73% lower in public centers and 69% lower in therapeutic communities relative to privately funded centers. Compared to programs offering only outpatient treatment, inpatient/residential-only programs were more 3.3 times more likely to have adopted medication-only smoking cessation. Programs offering a mixture of inpatient/residential and outpatient

services were 2.4 times more likely to have adopted medication-only services than programs with only outpatient levels of care. The odds of adoption were almost 4 times greater in hospital-based programs when compared to freestanding organizations. Organizational size was positively associated with the adoption of medication-only smoking cessation services.

The last column of Table 5 presents the odds ratios for adoption of comprehensive smoking cessation services (i.e., a formal counseling program with medications) relative to the reference category of no services. Three organizational barriers were significant. Greater endorsement of the norm that smoking was not important in treating substance abuse was negatively associated with the adoption of comprehensive smoking cessation services. Lack of time due to an already demanding treatment protocol and lack of staff skills were significant barriers to adoption. There was also a strong positive association between the adoption of the bundle of intake procedures and adoption of comprehensive services. Programs that had adopted the intake bundle were 4.6 times more likely to have adopted comprehensive services, relative to programs that had not adopted the intake bundle.

Several of the structural characteristics were significantly associated with adoption of comprehensive smoking cessation services. Compared to private centers, the odds of adoption were 56% lower in public centers. Programs with inpatient/residential-only services were more likely than outpatient-only programs to have adopted comprehensive smoking cessation services. Hospital-based programs were significantly more likely than freestanding programs to have adopted comprehensive smoking cessation services. Finally, there was a positive association between organizational size and the adoption of comprehensive smoking cessation services.

DISCUSSION

This research adds to a small but growing literature on the availability of smoking cessation services in substance abuse treatment organizations. These three national samples encompassed organizations reliant on varying funding sources and multiple modalities of treatment, representing the broadest range of programs studied to date. Consistent with other recent studies,^{15, 18, 22} these large samples of publicly-funded treatment organizations, privately-funded treatment organizations, and therapeutic communities reported relatively low levels of adoption of comprehensive smoking cessation services.

In addition to measuring smoking cessation services, this research was unique in its examination of brief interventions during the intake process that were consistent with the Public Health Service's clinical practice guideline.¹³ Consideration of intake procedures was important in multiple respects. First, it revealed that while nearly all programs ask about current smoking, rates of adoption of brief interventions to engage clients in smoking cessation, such as advising tobacco users to quit and assessing willingness to quit, were much lower. This finding suggests a disconnect between the collection of information about current smoking by treatment programs and the use of that information to engage clients in the process of cessation. Very low adoption of the bundle of intake procedures also suggests that focusing on individual indicators may overestimate the extent to which the intake process thoroughly addresses clients' tobacco use. Studies documenting configurations practices in substance abuse treatment have been relatively rare,³⁸ and these data on the intake bundle suggest the continued need for measuring combinations of services in the context of treatment organizations. Finally, these data revealed that adoption of this bundle of guideline-consistent intake procedures was a significant correlate of adoption of medication-only smoking cessation services and comprehensive services.

An additional contribution of this research was its documentation of organizational barriers to the adoption of tobacco-related intake procedures and cessation services. A key barrier was the lack of clinical skills related to smoking cessation. Lower levels of staff skills were a barrier to the adoption of the intake bundle and the adoption of the two types of services that included counseling. As noted by Ziedonis and colleagues, substance abuse treatment counselors rarely receive formal training in smoking cessation.²³ These findings point to the need for greater training opportunities for clinical staff to develop competence in smoking cessation counseling.

Some recent discussions on the barriers to smoking cessation services in substance abuse treatment have focused on staff culture, particularly how tobacco use by staff may perpetuate a culture in which smoking cessation for clients is not valued.^{2, 17, 23} These data did not support the argument that staff smoking was a significant barrier to the organization-level adoption of the intake bundle or the typology of services. Neither the percentage of clinical staff who smoke nor the acceptability of smoking in the staff culture were associated with adoption of the intake bundle or adoption of cessation services. Questions might be raised about administrators' abilities to describe the rate of staff smoking accurately. Notably, the average rate of staff smoking as reported by administrators paralleled the rates summarized in a recent literature review.¹⁷ As part of this research, surveys were sent to counselors in which their personal tobacco use was measured; about 20.5% of counselors reported current tobacco use which is highly consistent with administrators' reports of staff smoking in the current study.

Other aspects of organizational culture, however, were significant barriers to adoption. The cultural norm that smoking was unimportant in terms of successful treatment of substance abuse was negatively associated with both the intake bundle and the odds of adopting comprehensive services. A perceived lack of time for delivering smoking cessation services given an already demanding treatment protocol was also a significant barrier to the adoption of comprehensive services.

Interestingly, there were no differences in the adoption of the intake bundle by center type, but there were differences in the adoption of smoking cessation services. On the one hand, adoption of the intake bundle requires modest investment of resources in terms of staff time and training because these are relatively brief interventions. Adoption of smoking cessation services, however, requires more commitment of resources related to the costs of medications and training staff to deliver smoking cessation counseling effectively. Notably, privately-funded centers were significantly more likely to have adopted two types of cessation services that include pharmacotherapy. This higher rate of medication adoption in privately-funded programs is consistent with prior studies focused on the adoption of medications to treat substance abuse and co-occurring mental health conditions.^{39, 40} These differences may reflect greater access to physicians in privately funded programs as well as these programs' enhanced experience and ability in seeking reimbursement from private insurers for delivering smoking cessation services.

Limitations

Several limitations of this research should be noted. First, these analyses are based on cross-sectional data so causal inferences cannot be made. Future research should continue to track longitudinal patterns of adoption and potential discontinuation of smoking cessation services in treatment programs. Second, this analysis focused on treatment program administrators as the sole source of data about organizational culture and service delivery. While this approach is common in health services research, it is possible that administrators may err in their descriptions of their programs.

There are also some limitations related to the representativeness of these data. These data are not representative of the entire U.S. substance abuse treatment system, as certain types of organization such as Veterans Administration, correctional, and methadone maintenance facilities were not included in these samples. The reliance on previous data with regard to structural characteristics was both a strength and a weakness of the current study. On the one hand, there may have been changes in some characteristics such as levels of care and organizational size that may have occurred. However, having the structural characteristics from an earlier wave of data collection allowed for the examination of potential bias related to non-response. For the three samples, participating programs were compared to non-participating programs on the structural characteristics. There were no differences within the publicly funded sample. In the privately funded and TC samples, the only significant difference was that participating programs were larger in size than non-participating programs. Closer examination revealed that smaller programs were at greater risk of closure, but that program size was not associated with the odds of refusing to participate or being unable to be contacted for the telephone interview. This heightened risk of closure in smaller programs is consistent with prior research.⁴¹

While our measures of barriers were informed by the existing literature, there are likely other barriers that were unmeasured in our study. One particular cultural barrier that we did not measure was the perception that smoking cessation interventions are more effective if individuals have already achieved a period of recovery. Cultural norms about the value of sequential rather than concurrent treatment of substance abuse and nicotine dependence may be negatively associated with the adoption of smoking cessation; this cultural barrier should be studied in future research. Although there is some evidence that individuals in recovery are more likely to be successful in quitting smoking, a recent meta-analysis concluded that sequential treatment strategies increase the likelihood individuals will not actually receive services.²

Finally, it is important to emphasize that these analyses were focused on adoption, meaning the availability of these services, rather than implementation. In particular, these data cannot speak to how routinely clients are offered or participate in cessation services within adopting programs. Studying the extent to which these services are being routinely implemented is an important direction for future research.

SUMMARY

This study examined a comprehensive array of organizational barriers to the adoption of tobacco-related intake procedures and smoking cessation services. A particularly salient barrier was the lack of clinical skills related to smoking cessation, which suggests that increasing access to training opportunities may be an important method for facilitating adoption in community-based treatment settings. There was some evidence that the cultural norm about smoking not being viewed as an important addiction treatment issue represents another salient barrier. Greater access to training about smoking cessation might also help to shift this cultural barrier. Future research should continue to examine the barriers and facilitators to the adoption and implementation of smoking cessation services as well as the role of training in promoting both skill acquisition and cultural change within treatment organizations.

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TABLE 1**Structural Characteristics of Drug and Alcohol Treatment Centers**

	All Centers % (N) or Mean (SD)	Private Centers % (N) or Mean (SD)	Public Centers % (N) or Mean (SD)	TCs % (N) or Mean (SD)
Center type				
Privately funded center	35.9% (310)			
Publicly funded center	33.0% (285)			
Therapeutic community (TC)	31.1% (269)			
Government-owned*	11.8% (102)	2.3% (7)	24.6% (70)	9.3% (25)
For-profit*	13.8% (119)	27.4% (85)	4.9% (14)	7.4% (20)
Organizational affiliation *				
Hospital-Based	20.8% (180)	51.0% (158)	3.9% (11)	4.1% (11)
CMHC	5.0% (43)	4.5% (14)	10.2% (29)	0.0% (0)
Freestanding	74.2% (641)	44.5% (138)	86.0% (245)	95.9% (258)
Levels of care *				
Inpatient/residential-only	28.9% (248)	10.4% (32)	24.7% (70)	54.5% (146)
Mixed levels of care	38.3% (329)	47.9% (147)	29.2% (83)	36.9% (99)
Outpatient-only	32.8% (282)	41.7% (128)	46.1% (131)	8.6% (23)
Full-time equivalent employees (natural-log transformed)	2.88 (1.12)	2.94 (1.30)	2.91 (1.05)	2.79 (0.97)

* Significant difference by center type, $p < .001$

Table 2

Descriptive Statistics for Smoking Cessation-Related Intake Procedures and Services

	All Centers % (N) or Mean (SD)	Private Centers % (N) or Mean (SD)	Public Centers % (N) or Mean (SD)	TCs % (N) or Mean (SD)
<i>Intake Procedures</i>				
Ask all clients if they are current smokers ^{a,b}	85.8% (733)	91.2% (281)	83.9% (235)	81.6% (217)
Advise current smokers/ tobacco users to quit ^{a,b}	42.4% (365)	49.2% (152)	38.7% (110)	38.6% (103)
Assess willingness to quit ^b	43.5% (373)	48.4% (149)	44.7% (126)	36.6% (98)
Use motivational techniques with clients who are unwilling to make a quit attempt	25.4% (217)	22.4% (69)	28.9% (81)	25.0% (67)
Develop a quit plan for clients willing to make a quit attempt	35.2% (298)	39.7% (121)	35.3% (98)	30.0% (79)
Program has adopted bundle of all five intake procedures	14.6% (126)	14.2% (44)	14.7% (42)	14.9% (40)
<i>Smoking Cessation Services^{a,b}</i>				
No formal services	57.8% (499)	39.7% (123)	70.5% (201)	65.1% (175)
Formal program without pharmacotherapy	5.8% (50)	4.8% (15)	6.0% (17)	6.7% (18)
Pharmacotherapy without a formal program	25.2% (218)	41.0% (127)	14.4% (41)	18.6% (50)
Formal program with pharmacotherapy	11.2% (97)	14.5% (45)	9.1% (26)	9.7% (26)

^aSignificant difference between private and public centers (p<.05, two-tailed test)

^bSignificant difference between private centers and TCs (p<.05, two-tailed test)

TABLE 3**Barriers to Smoking Cessation Services and Staff Smoking**

	All Centers Mean (SD)	Private Centers Mean (SD)	Public Centers Mean (SD)	TCs Mean (SD)
Smoking is an accepted part of the staff culture at this treatment program. ^{a,b}	2.03 (1.79)	1.77 (1.69)	1.97 (1.78)	2.39 (1.85)
Smoking and tobacco use are not important issues in the successful treatment of other substance abuse problems.	1.98 (1.71)	2.04 (1.65)	1.89 (1.71)	2.02 (1.78)
Our treatment protocol is so demanding that there would be little or no time for adding smoking cessation activities.	1.63 (1.67)	1.70 (1.70)	1.55 (1.61)	1.64 (1.70)
Allowing clients to continue their smoking or other tobacco use facilitates successful treatment of their primary substance abuse issues.	2.08 (1.69)	2.05 (1.65)	1.98 (1.67)	2.23 (1.74)
It is very difficult to be reimbursed for staff time devoted to clients' smoking cessation. ^a	2.97 (2.06)	3.27 (1.99)	2.87 (2.08)	2.71 (2.08)
Our staff generally does not have the skills to provide smoking cessation treatments to clients. ^a	2.21 (1.78)	2.04 (1.73)	2.15 (1.78)	2.47 (1.82)
Our staff does not have interest in providing our clients with smoking cessation treatments.	1.91 (1.62)	1.85 (1.64)	1.90 (1.60)	2.01 (1.62)
Percentage of clinical staff who smoke or use tobacco ^{a,b}	21.75 (21.97)	17.91 (19.05)	19.54 (20.32)	28.53 (25.11)

^a Significant difference between private centers and TCs ($p < .05$, two-tailed test)

^b Significant difference between public centers and TCs ($p < .05$, two-tailed test)

TABLE 4

Logistic Regression of Adoption of Tobacco-Related Intake Procedures

	Odds Ratio (95% Confidence Interval)
Staff smoking culture	0.97 (0.84-1.11)
Smoking not important in treating substance abuse problems	0.79 ** (0.69-0.91)
Demanding treatment protocol leaves no time	0.93 (0.81-1.08)
Smoking helps treatment	0.88 (0.77-1.01)
Difficulty in getting reimbursement	1.02 (0.92-1.13)
Staff lacks skills	0.84 * (0.74-0.96)
Staff lacks interest	0.87 (0.74-1.01)
% Clinical staff who smoke	1.00 (.99-1.01)
Center type	
Private center	Reference
Public center	1.02 (0.55-1.88)
Therapeutic community	1.28 (0.67-2.46)
Government-owned	0.92 (0.47-1.78)
For-profit	0.65 (0.32-1.30)
Organizational affiliation	
Hospital-based	1.13 (0.61-2.09)
Community mental health	0.50 (0.16-1.54)
Freestanding	Reference
Levels of care	
Inpatient/residential-only services	0.79 (0.44-1.43)
Mixed levels of care	0.65 (0.36-1.14)
Outpatient-only services	Reference
Number of full-time equivalent employees (natural-log transformed)	1.14 (0.92-1.41)

*
p < .05**
p < .01, (two-tailed test)

Table 5**Multinomial Logistic Regression of Adoption of Smoking Cessation Services**

	Formal Program (vs. No Services) RRR (95% CI)	Medications- Only (vs. No Services) RRR (95% CI)	Program and Medications (vs. No Services) RRR (95% CI)
Adoption of the intake bundle	1.53 (0.68-3.45)	1.85 * (1.07-3.18)	4.63 *** (2.57-8.33)
Staff smoking culture	0.95 (0.78-1.17)	1.03 (0.91-1.16)	1.07 (0.91-1.27)
Smoking not important in treating substance abuse problems	0.90 (0.74-1.09)	0.94 (0.83-1.06)	0.79 ** (0.67-0.94)
Demanding treatment protocol leaves no time	1.02 (0.83-1.26)	0.90 (0.79-1.02)	0.74 ** (0.61-0.90)
Smoking helps treatment	0.82 (0.67-1.01)	1.01 (0.90-1.13)	1.08 (0.93-1.26)
Difficulty in getting reimbursement	0.99 (0.85-1.15)	0.96 (0.87-1.06)	1.02 (0.91-1.17)
Staff lacks skills	0.72 ** (0.58-0.89)	0.92 (0.82-1.04)	0.78 ** (0.66-0.92)
Staff lacks interest	0.98 (0.78-1.24)	1.04 (0.91-1.19)	0.95 (0.79-1.15)
% Clinical staff who smoke	0.98 (0.96-1.01)	1.00 (0.99-1.01)	1.00 (0.99-1.02)
Center type			
Private center	Reference	Reference	Reference
Public center	0.56 (0.22-1.46)	0.27 *** (0.15-0.47)	0.44 * (0.21-0.93)
Therapeutic community	0.81 (0.30-2.20)	0.31 *** (.18-0.54)	0.47 (0.21-1.03)
Government-owned	2.51 * (1.08-5.85)	1.36 (0.74-2.50)	0.97 (0.41-2.29)
For-profit	0.72 (0.25-2.10)	0.99 (0.57-1.73)	0.73 (0.32-1.65)
Organizational affiliation			
Hospital-based	1.43 (0.52-3.90)	3.97 *** (2.33-6.78)	4.88 *** (2.34-10.21)
Community mental health	0.63 (0.13-2.97)	0.81 (0.31-2.09)	1.83 (0.63-5.34)
Freestanding	Reference	Reference	Reference
Levels of care			
Inpatient/residential-only services	1.74 (0.69-4.36)	3.31 *** (1.87-5.85)	2.72 ** (1.28-5.78)
Mixed levels of care	2.25 (0.95-5.30)	2.42 ** (1.44-4.08)	1.73 (0.86-3.49)
Outpatient-only services	Reference	Reference	Reference
Number of full-time equivalent employees (natural-log transformed)	1.04 (0.74-1.46)	1.53 *** (1.26-1.85)	1.64 *** (1.26-2.13)

*
p<.05

**
p<.01,

p<.001 (two-tailed test)