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Smoking Cessation Services in Adolescent Substance Abuse Treatment: Opportunities Missed?

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Abstract

The majority of adolescents receiving substance abuse treatment also use tobacco, yet there are few data regarding the adoption of tobacco use assessment and smoking cessation services by adolescent treatment programs. Using data from a national sample of adolescent-only treatment programs ($n = 154$), this research measures the adoption of aspects of assessment and treatment from the Public Health Service's (2000) guideline, Treating Tobacco Use and Dependence. When adoption of four intake/assessment practices was measured, adoption appeared high, but only 45% of programs had adopted all four practices. About 43% of programs offered some type of smoking cessation services. However, there was no association between adoption of intake procedures and the odds of availability of smoking cessation services, suggesting a lack of connection between the identification of treatment needs and the availability of services. The lack of smoking cessation services may represent a missed opportunity for early intervention with this population.

Introduction

While there is growing interest in the treatment of nicotine dependence as part of addiction treatment (Reid et al., 2007), little attention has been focused directly on the needs of adolescents with substance abuse disorders (SUDs) despite indications that tobacco use is a significant health issue for this population. As in adults (Kalman et al., 2001; Richter, Ahluwalia, Mosier, Nazier, & Ahluwalia, 2002; Williams & Ziedonis, 2004), the rate of smoking among adolescents with SUDs is far greater than among those without such disorders (Bowman & Walsh, 2003; Myers, 1999; Myers, Doran, & Brown, 2007). For example, about 61% of adolescents receiving substance abuse treatment report smoking more than 10 cigarettes per day (Myers & Brown, 1994); only about 6% of twelfth graders report this level of daily consumption (Johnston, O'Malley, Bachman, & Schulenberg, 2007). In a study of adolescents receiving substance abuse treatment, a majority had attempted to quit using tobacco in the previous year (Myers & MacPherson, 2004), suggesting that they may have considerable interest in smoking cessation. Despite the public health significance of reducing smoking among adolescents with SUDs, there is currently little research on the availability of smoking cessation services within adolescent treatment programs (Chun, Guydish, & Chan, 2007; Myers & Kelly, 2006).

Clinical Practice Guidelines for Smoking Cessation

In 2000, the US Public Health Service (PHS) released a clinical practice guideline consisting of several key elements for identifying and treating tobacco users (The Tobacco Use and Dependence Clinical Practice Guideline Panel, Staff, and Consortium Representatives, 2000). A revised version of the guideline was released in 2008 after the completion of data collection, so the present study focuses on the 2000 PHS guideline. The 2000 PHS guideline

recommended asking all patients about their tobacco use and advising users to stop using tobacco products (Fiore et al., 2000). It indicated that clinicians should assess whether the patient wanted to attempt to quit and use brief interventions to increase motivation in those unwilling to make a quit attempt. For those willing to make a quit attempt, services should be arranged, including formal psycho-social counseling and pharmacotherapies. These recommendations have been retained in the 2008 update. Medications approved by the Food and Drug Administration (FDA) at the time of the 2000 PHS guideline included nicotine replacement therapy (NRT) and sustained-release bupropion hydrochloride (e.g., Zyban[®]), which is an atypical antidepressant. Varenicline (e.g., Chantix[®]) became available after the publication of the 2000 PHS guideline, and is now recommended for treating adult tobacco users in the updated guideline (Fiore et al., 2008). For adults, the combination of counseling with medication improves the odds of successful cessation (Fiore et al., 2000; Fiore et al., 2008). Combined services have also been advocated by the National Institute on Drug Abuse (NIDA) (2000). In discussing specific populations, the 2000 PHS guideline addressed tobacco use by individuals with SUDs and by adolescents, although it did not address the two issues simultaneously (Fiore et al., 2000). Some have noted that pharmacotherapies may have adverse effects for some adolescents (Patten et al., 2001), and nicotine replacement products are not available over the counter for purchase by individuals younger than 18 years old (Moolchan, Aung, & Henningfield, 2003). However, the 2000 PHS guideline suggested that pharmacotherapies were appropriate if adolescents were nicotine dependent and wanted to cease using tobacco products (Fiore et al., 2000). The 2008 guideline does not recommend pharmacotherapy for adolescents due to insufficient evidence of its effectiveness in promoting tobacco abstinence (Fiore et al., 2008). The recommendations for adolescents in the 2008 update focus on assessment of use, clear advice about quitting, and counseling interventions, and also indicate that additional research is needed about these interventions and the use of pharmacotherapy for adolescent tobacco users.

While there is no definitive guidance about the “ideal” approach to treating adolescents with SUDs who also smoke, the 2000 PHS guideline does offer a useful conceptual approach for categorizing what constitutes “usual care” for smoking cessation in adolescent treatment programs. First, programs might adopt intake/assessment procedures that identify tobacco users and then engage them in discussions about quitting smoking. Of interest is the adoption of specific procedures as well as the adoption of these procedures as a “bundle” of relevant intake/assessment procedures. The second type of adoption focuses on the “usual care” for smoking cessation in terms of services. Adolescent treatment programs can be categorized into those that offer comprehensive services (formal program with pharmacotherapy), a formal program without pharmacotherapy, only pharmacotherapy, or neither type of smoking cessation services.

Adoption of Smoking Cessation Services in Addiction Treatment

Health services research on the availability of smoking cessation services in addiction treatment organizations is limited to a small number of studies. Data collected in the 1990s in Minnesota (Knapp, Rosheim, Meister, & Kottke, 1993) and Kentucky (Hahn, Warnick, & Plemmons, 1999) revealed that few treatment organizations assessed clients for their tobacco use or offered smoking cessation services. A national study of opioid treatment programs showed that while a strong majority of programs asked about tobacco use and advised smokers to quit, few programs offered both counseling and pharmacotherapy (Richter, Choi, McCool, Harris, & Ahluwalia, 2004). About one-third of treatment programs participating in NIDA’s Clinical Trials Network offered smoking cessation services (Fuller et al., 2007). Recently, Friedmann, Jiang, & Richter (2008) reported that about 41% of outpatient programs had adopted some type of smoking cessation services, although the adoption of pharmacotherapy was limited to just 16.5% of programs. As noted in their

discussion, these national data could not directly address whether these services were offered to adolescent clients. The only available data on adolescent treatment has been a study of the 17 treatment programs participating in CSAT's Adolescent Residential Treatment project; about 42% offered counseling for smoking cessation and 42% had adopted NRT (Chun et al., 2007).

Organizational Factors in Innovation Adoption

Previous health services research on the quality of addiction treatment and adoption of evidence-based practices has considered a variety of organizational correlates, including measures of structure, staffing, and other services (Durkin, 2002; Friedmann, Alexander, & D'Aunno, 1999; Friedmann, Alexander, Jin, D'Aunno, 1999; Friedmann, Lemon, Durkin, & D'Aunno, 2003; Knudsen, Ducharme, & Roman, 2007a; Knudsen, Ducharme, & Roman, 2007b). This broader literature, particularly studies on the adoption of wraparound services and adoption of medications, informed the selection of organizational correlates for the current study. Several studies have considered the "public-private distinction" (Perry & Rainey, 1988), partly due to concerns about disparate levels of quality between these sectors (Rodgers & Barnett, 2000; Wheeler & Nahra, 2000). Heinrich and Fournier (2004) argue that substance abuse treatment programs vary in their "publicness" based on their ownership and funding streams. For example, organizations may be owned by local or state governmental entities or be privately owned. Even among privately owned organizations, there is substantial variation in the extent to which they receive funding from state-administered block grant funds or contracts. Additionally, privately owned programs may be operated on a non-profit or for-profit basis. These dimensions of "publicness" may result in differing environmental demands as well as differences in organizational missions and goals, resulting in variations in patterns of service delivery (Perry & Rainey, 1988).

Two additional structural characteristics that may be correlated with the adoption of smoking cessation services are hospital affiliation based programs may be more likely to adopt smoking cessation services because of their broader mission towards health and well-being as well as their greater access to medical resources (Friedmann et al., 2008). Hospital-based programs have also been shown to be more likely to adopt pharmacotherapies to treat addiction and co-occurring mood disorders (Knudsen et al., 2007b). Accreditation is often viewed as a proxy for quality (Alexander & Wheeler, 1998) and is associated with the adoption of wraparound services (Friedmann, Alexander, & D'Annunzio, 1999). Friedmann et al., (2008) found that accredited outpatient programs were more likely to have adopted smoking cessation services than non-accredited programs.

Previous research has also considered the relevance of staffing in the adoption of high-quality treatment practices (Ducharme, Mello, Roman, Knudsen, & Johnson, 2007; Knudsen et al., 2007a; Knudsen et al., 2007b). One aspect of staffing is organizational size, as measured by the number of employees. Programs with a limited number of staff simply may not have the resources to broaden their scope beyond their core addiction treatment services (Ducharme et al., 2007). A second aspect of staffing is access to physicians, which is associated with the adoption of medications for the treatment of addiction and psychiatric conditions (Knudsen et al., 2007a; Knudsen et al., 2007b). The presence of physicians may be associated with smoking cessation services, particularly the use of pharmacotherapy.

Rogers (1995) noted the importance of the fit between the characteristics of innovations and "previously introduced ideas" within the organization, suggesting that smoking cessation innovations may be more likely to be adopted when they are consistent with other services. By this logic, the adoption of the tobacco-related intake/assessment procedures may be more likely in programs that also conduct a multifaceted comprehensive assessment measuring adolescents' substance use, psychiatric, and family-related service needs. Likewise,

pharmacotherapies for smoking cessation may be more likely to be adopted by programs that use medications for other conditions. In their study of outpatient programs, Friedmann et al. (2008) found a positive relationship between offering other medications and the availability of smoking cessation pharmacotherapy.

Another potentially relevant dimension of service delivery is whether programs offer 24-hour types of care, such as inpatient or residential treatment. Some have argued that smoking cessation may be particularly valuable for individuals in these highly intensive levels of care (Sharp, Schwartz, & Nightingale, 2003). A correlation between inpatient or residential care and smoking cessation services may reflect an organization's attempt to address regulatory requirements for such facilities to be "smoke-free" (Brigham, Schroeder, & Schindler, 2007; Williams et al., 2005). These more intensive treatment settings may be better able to address accreditation. Hospital- nicotine dependence since they have more clinical contact hours per day relative to outpatient levels of care.

Given the general paucity of literature on the delivery of smoking cessation services in adolescent-only treatment programs, this current study is largely exploratory in its aims. The first aim of the study is to document the adoption of intake and assessment procedures related to tobacco use and the availability of smoking cessation programming. Such data would be indicative of what constitutes "usual care" within these programs. The second aim is to examine associations between organizational correlates and the adoption of a bundle of admission procedures that parallel the 2000 PHS clinical practice guideline. Finally, this study considers whether organizational correlates are associated with the odds of offering smoking cessation services, such as a formal program with pharmacotherapy, a formal program without pharmacotherapy, or pharmacotherapy-only services.

Methods

Samples and Study Eligibility

This research utilized two existing samples of specialty addiction treatment organizations from the National Treatment Center study (NTCS) in order to identify adolescent-only substance abuse treatment programs. These nationally representative samples of publicly funded and privately funded treatment organizations were originally constructed between 2002 and 2004, and face-to-face interviews were conducted to collect data on a variety of organizational characteristics. For both samples, organizations were required to offer a minimum level of care at least equivalent to standard outpatient care for the treatment of alcohol and drug abuse (Mee-Lee, Gartner, Miller, Shulman, & Wilford, 1996) and to be open to the public. Privately funded programs received less than half of their revenues from government block grants and contracts, while publicly funded programs received more than half of their revenues from these sources. About 80% of publicly funded ($n = 363$) and 88% of privately funded programs ($n = 403$) participated in this earlier study. A thorough description of the sampling methodology can be found in Knudsen et al. (2007a).

These 766 treatment organizations served as the population of treatment centers contacted for the present study. A few organizations indicated that they had multiple, administratively distinct adolescent-only treatment programs, resulting in a final pool of 770 treatment centers. All were contacted by telephone to establish that the organization was still delivering substance abuse treatment services; about 4.8% of these organizations had closed ($n = 37$) and 3.9% ($n = 30$) were unable to be contacted after repeated attempts so eligibility could not be established. Eligibility for the present study was based on two criteria. First, treatment organizations were required to admit clients of 18 years or younger. Of the 770 centers, 39.7% ($n = 306$) were ineligible because they did not admit clients aged 18 or younger. Second, organizations were required to offer at least one adolescent-only treatment

program. About 21.8% ($n = 168$) of centers admitted adolescents but did not offer a separate program.

Program managers from eligible organizations were invited to participate in a telephone interview. Of the 229 programs deemed eligible, 154 participated in the study (67.2%). Of the 110 eligible publicly funded programs, 71 programs participated in the telephone interviews; among privately funded programs, 83 of 119 eligible programs participated. Participating treatment programs received a \$30 honorarium. These interviews were conducted between July, 2005 and March, 2007.

Measures

Tobacco Use Assessment and Smoking Cessation Services

Program managers were asked about the use of four practices during intake/assessment related to adolescents' tobacco use. These practices were: 1) asking all adolescents during intake/assessment about whether they currently use tobacco products; 2) advising all tobacco users to quit as part of the intake/assessment process; 3) assessing the level of willingness to quit for all current users; and 4) using motivational techniques during intake/assessment to increase willingness to quit. Each measure was dichotomous. Programs were also coded for whether they had adopted this "bundle" of intake/assessment practices, meaning the program used all four practices (1 = use all four; 0 = uses less than all four). Smoking cessation services were coded into a four-category typology. Programs were coded into those that offered a comprehensive program of counseling and pharmacotherapy (i.e., NRT and/or bupropion-SR, as varenicline was not FDA-approved during data collection), a smoking cessation program without pharmacotherapy, pharmacotherapy-only services, or no services.

Independent Variables

A variety of measures of organizational structure, staffing, and services were considered. First, centers were coded on five structural variables assessing whether programs were part of the publicly funded sample (1 = publicly funded, 0 = privately funded), were owned by a governmental entity (1 = government-owned, 0 = privately owned), were operated on a for-profit basis (1 = for-profit, 0 = non-profit), were located within a hospital setting (1 = hospital-based, 0 = freestanding), or were accredited by an external entity such as the Joint Commission or Commission on Accreditation of Rehabilitative Facilities (1 = accredited, 0 = not accredited).

Two indicators of staffing were measured. Centers were coded for whether they were small programs (1 = less than 10 employees in the adolescent program; 0 = 10 or more employees). A measure of whether the adolescent program had any physicians on the payroll was also included (1 = at least one physician; 0 = no physicians). Four indicators of service delivery and one caseload composition measure were considered. A measure of "best practices" in assessment and treatment matching was constructed by adding four dichotomous indicators of whether the program: 1) uses standardized measures for assessing substance abuse, psychological functioning, and family functioning; 2) routinely screens for four co-occurring mental health conditions (depression, anxiety, attention deficit/hyperactivity disorder, and conduct disorder); 3) uses the American Society of Addiction Medicine patient placement criteria; and 4) has multiple levels of care to allow for treatment matching. This measure had a possible range of zero to four. The availability of inpatient adolescent-only treatment (1 = inpatient offered, 0 = no inpatient program) and residential adolescent-only treatment (1 = residential offered, 0 = no residential program) was also measured. Programs were coded for whether they prescribed psychiatric medications to

adolescent clients (1 = uses psychiatric medications; 0 = no medications). Finally, managers reported the percentage of adolescent tobacco users in the program's caseload.

Statistical Analysis

In addition to descriptive statistics, two statistical techniques were used for analyzing the categorical dependent variables (Long, 1997; Long & Freese, 2003). The first set of analyses focused on the dichotomous measure of whether the treatment program had adopted the bundle of intake/assessment practices. Logistic regression was used to analyze this dichotomous variable with each organizational characteristic considered at the bivariate-level. In the second set of analyses, the typology of smoking cessation services was examined using multinomial logistic regression (MLR) because this variable consisted of more than two unordered categories (Long, 1997). A series of bivariate MLR analyses were conducted so that each organizational characteristic could be considered. In addition to statistical significance, MLR coefficients can also be expressed as "relative risk ratios" which are analogous to odds ratios in logistic regression. All analyses were conducted using Stata 10.0.

Results

Descriptive statistics for all measures appear in Table 1. The average adolescent treatment program indicated that nearly three-quarters of their adolescent clients were tobacco users (mean = 71.7, *SD* = 24.4).

Tobacco-related practices during intake/assessment

When each assessment procedure was analyzed separately, a strong majority of adolescent-only treatment programs had adopted each of these practices, as seen in Table 1. Asking all adolescent clients about tobacco use as part of the intake/assessment process was a nearly universal practice (97.7%). Rates of advising all current users to quit (71.0%) and assessing willingness to quit among tobacco users (82.4%) were also very high. The least prevalent practice was the use of motivational techniques to increase willingness to quit but even this practice was adopted by a majority of programs (61.8%). Despite the high prevalence of each practice, a smaller percentage of programs (45.8%) had adopted the bundle of all four assessment practices.

A series of bivariate logistic regression analyses were conducted to ascertain whether the organizational structure, staffing, and services variables were associated with the adoption of the bundle of four intake/assessment practices (Table 2). The only significant association was for the measure of and treatment matching. This positive association indicated that for each additional assessment/treatment matching practice adopted, there was a 58% increase in the odds that the program had adopted the bundle of tobacco-related intake/assessment procedures (*OR* = 1.58, 95% *C.I.* = 1.07–2.33). The only other variable that approached significance was location within a hospital, with hospital-based programs tending to be less likely than freestanding programs to have adopted the assessment bundle.

Smoking Cessation Services in Adolescent-Only Substance Abuse Treatment

About 42.8% of adolescent-only programs offered some type of smoking cessation programming for adolescent tobacco users (Table 1), which consisted of 13.0% offering a comprehensive formal program with pharmacotherapy, 15.3% offering a counseling-only program, and 14.5% offering only pharmacotherapy. About 57.3% of programs offered neither a formal smoking cessation program nor pharmacotherapy to their adolescent clients.

Each of the measures of organizational structure, staffing, and services were examined through a set of bivariate multinomial regression models as correlates of the type of service offered (Table 3). Essentially, each analysis considered whether a variable increased or decreased the odds of programs offering a comprehensive program of counseling plus pharmacotherapy, counseling-only, or pharmacotherapy-practices in assessment only, relative to the odds of not offering any smoking cessation services.

In comparing the odds of offering a comprehensive program to the odds of no services, six correlates were statistically significant at the bivariate level. First, programs with at least one physician on staff were more likely than programs without physicians to have a comprehensive smoking cessation program ($RRR = 2.88$, 95% $C.I. = 1.65$ – 15.43). Smaller programs were less likely than larger programs to offer a comprehensive smoking cessation program ($RRR = .12$, 95% $C.I. = .02$ – $.55$). Programs that had adopted more of the best practices in assessment and treatment matching were less likely to offer a comprehensive smoking cessation program ($RRR = .56$, 95% $C.I. = .32$ – $.99$). The presence of an inpatient program ($RRR = 12.44$, 95% $C.I. = 3.34$ – 46.37) and the presence of a residential treatment program ($RRR = 5.13$, 95% $C.I. = 1.56$ – 16.89) were positively associated with offering a comprehensive smoking cessation program. Finally, there was a strong positive relationship between whether programs prescribed psychiatric medications and the availability of a comprehensive smoking cessation program that included pharmacotherapy ($RRR = 7.35$, 95% $C.I. = 2.16$ – 24.97).

In comparing the odds of offering a counseling-only smoking cessation program to the odds of not offering any services, only one organizational variable was significant at the bivariate level. The odds of offering cessation program were significantly lower in accredited programs relative to non-accredited programs ($RRR = .26$, 95% $C.I. = .09$ – $.79$).

Eight of the organizational correlates were associated at the bivariate level with the odds of offering only pharmacotherapy relative to the odds of no smoking cessation services. The odds of pharmacotherapy-only services were significantly lower among publicly funded programs relative to privately funded programs ($RRR = .10$, 95% $C.I. = .02$ – $.48$). Hospital-based programs were more likely to offer pharmacotherapy-only than freestanding facilities ($RRR = 4.69$, 95% $C.I. = 1.63$ – 13.53). Having at least one physician on staff was positively associated with having pharmacotherapy-only smoking cessation services ($RRR = 7.70$, 95% $C.I. = 2.46$ – 24.13), while smaller programs were less likely than larger programs to offer pharmacotherapy-only services ($RRR = .10$, 95% $C.I. = .02$ – $.48$). There was a positive association between the number of best practices in assessment and treatment matching and the likelihood of pharmacotherapy-only services ($RRR = 2.42$, 95% $C.I. = 1.22$ – 4.79). The likelihood of offering only pharmacotherapy was significantly greater if the program offered inpatient treatment ($RRR = 6.46$, 95% $C.I. = 1.72$ – 24.34) or residential treatment ($RRR = 6.60$, 95% $C.I. = 2.11$ – 20.60). Finally, the availability of psychiatric medications was positively associated with the odds of programs offering pharmacotherapy-only services for smoking cessation ($RRR = 12.06$, 95% $C.I. = 3.20$ – 45.46).

Discussion

Relatively few studies have documented the adoption of tobacco-related assessment procedures and smoking cessation services in substance abuse treatment programs (Currie, Nesbitt, Wood, & Lawson, 2003; Friedmann et al., 2008; Richter et al., 2004). Very little health services research on smoking cessation has been conducted in adolescent-only treatment programs (Chun et al., 2007; Myers & Kelly, 2006). Consistent with the literature on high rates of tobacco use in adult and adolescent substance-abusing populations (Callaghan et al., 2007; Myers et al., 2007; Myers & Brown, 1994; Upadhyaya, Deas,

Brady, & Kruesi, 2002), this research found that nearly three-quarters of adolescent clients served by these programs were tobacco users. This high prevalence indicates a significant tobacco use and offering services to help adolescents quit smoking.

This research measured the adoption of tobacco-related intake/assessment practices and smoking cessation services in adolescent-only treatment programs. Rates of adoption for the four specific practices—asking about use, advising users to quit, assessing willingness to quit, and using motivational techniques to enhance willingness to quit—were quite high. Nearly all programs asked adolescent clients about their tobacco use, a finding similar to that of Richter et al.'s (2004) study -only smoking of practices within opioid treatment programs. Somewhat smaller percentages of adolescent-only programs engaged in the other assessment-related practices. Overall, about 42.8% of programs did some type of smoking cessation programming, a rate consistent with Friedmann et al.'s (2008) study of outpatient programs. Clearly, there is room for greater adoption of smoking cessation services in these programs, particularly given that the majority of adolescent clients use tobacco products.

The data on tobacco-related intake/assessment practices yielded somewhat different conclusions based on whether individual practices or a bundle of practices are considered. If only the individual indicators were measured, it appeared that these intake/assessment procedures are routine aspects of usual care. The lower prevalence of the aggregate bundle, however, suggests that these practices are not necessarily being adopted within the same organizations. That is to say, a focus on individual indicators may overestimate the extent to which intake/assessment practices thoroughly address tobacco use. Continued consideration of configurations of practices and services in treatment organizations may inform broader discussions of treatment quality, particularly given that there are few studies of configurations of high-quality practices (Ducharme et al., 2007).

The attempt to examine organization-level correlates of the assessment bundle identified only one significant variable. Consistent compatibility with previously introduced ideas, these data indicated that the adoption of the bundle of intake/assessment practices was more likely in programs that had adopted a greater number of other “best practices” in assessment and treatment matching. It is unclear why the other variables were not significant, although one possibility may be related to the relative ease of adopting a set of very brief psychosocial interventions. This bundle of procedures is relatively simple and inexpensive in terms of staff time and training; indeed, such relative ease and minimal cost is the underlying logic of brief interventions. It may be the case that the relative simplicity of these interventions means that structural, staffing, and service delivery barriers are less relevant than when innovations are more complex, time-consuming, or require specific staffing resources.

The analyses of the typology of smoking cessation services revealed more substantive findings. Organization-level correlates were most “successful” in terms of statistical significance for pharmacotherapy-only services, and least predictive for formal counseling-only programming. The findings, particularly for the adoption of smoking cessation pharmacotherapies, pointed to the relevance of consistency with other services, such as the availability of other types of medications. Rogers' (1995) contention about the importance of resources and norms in facilitating innovation adoption was supported by the findings that pharmacological approaches to smoking cessation were more likely when programs had physicians or were located within a hospital. Smaller programs were less likely to offer smoking cessation services that included pharmacotherapy, suggesting that having a limited staff may narrow the range of services that can be offered.

It is unclear why there was no association between the adoption of the bundle of intake/assessment procedures and the adoption of the different types of smoking cessation services. In additional analyses, the number of tobacco-related intake/assessment practices adopted was tested as a correlate of smoking cessation services, and it was not significant. None of the individual intake/assessment procedures were significantly correlated with smoking cessation services. However, the lack of significant relationships points to a gap in which tobacco-related service needs may be identified but where smoking cessation services may or may not actually be available.

There are several limitations in this research that should be noted. First, these analyses are based on cross-sectional data so it is not possible to establish causality. In addition, program managers may not be the best source of data on assessment procedures, given that other clinical staff most likely conduct these assessments. Program managers are likely to be knowledgeable about the major domains covered during assessments, however, as they likely have approved the forms used for documentation purposes. Third, these data are only representative of adolescent-only treatment programs; treatment centers that combine adolescent clients with adults were excluded from the data collection. The decision to focus on adolescent-only programming was based on Center for Substance Abuse Treatment's (1999) recommendation that adolescents should be treated in programs that are separate from adult programs.

A substantial limitation was the modest sample size, which resulted in small cell sizes for the categorical measure of smoking cessation services. In part, this limitation was a function of the substantial proportion of facilities not admitting adolescents or not offering adolescent-only services as well as the 67% response rate. Out of concern for potential response bias, an analysis was conducted to test whether non-responding programs differed from participating programs on basic organizational characteristics (Knudsen, 2009). This analysis did not reveal significant differences. The small cell sizes in the services restricted our analyses to the bivariate level rather than allowing for the estimation of more complex multivariate models. However, it is important to note that while multivariate models might be useful in addressing theoretical questions related to service delivery, our results are meaningful in terms of describing access to services. While a multivariate model might ultimately explain why inpatient or residential programs are more likely to offer smoking cessation medications, the bivariate association is enough to show that adolescents are more likely to have access to these services if they receive treatment from a program that offers such 24-hour care. In this sense, even bivariate associations have real-world significance.

Despite these limitations, this research contributes to the emerging literature on the delivery of smoking cessation services in addiction treatment organizations. As noted by Friedmann et al. (2008), there has been a need for data on services for special populations, such as adolescents. This study revealed that while specific intake/assessment procedures have been widely adopted, the majority of adolescent-only treatment programs have not yet adopted smoking cessation services. Some treatment providers may believe individuals with SUDs who also smoke are unwilling to quit (Campbell, Wander, Stark, & Holbert, 1995; Friend & Levy, 2004), particularly if they are smokers themselves (Guydish, Passalacqua, Tajima, & Manser, 2007). However, it has been shown that when treatment programs do not include smoking cessation as part of their programming, adolescents generally continue to smoke after leaving treatment (Myers & Brown, 1997). Recent research in adults suggests that continued smoking may actually be positively associated with the likelihood of relapse (Lemon, Friedmann, & Stein, 2003; McCarthy, Collins, & Hser, 2002), which points to the importance of making services available so that those patients who are interested in quitting can receive the assistance that they may need.

There are several important avenues for future research. First and foremost, there is a need for more research to establish the effectiveness of specific smoking cessation interventions in adolescents (Fiore et al., 2008; Hanson, Zylla, Allen, Li, & Hatsukami, 2008). Future research should continue to monitor the availability of smoking cessation services in addiction treatment for both adolescents and adults. Given the relatively small literature, there is an ongoing need for more research on the organizational factors that promote the adoption of smoking cessation services in addiction treatment. Finally, there is a need for research on how systems-level factors, such as treatment financing and state regulations, may be related to the delivery of smoking cessation services by addiction treatment organizations.

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Table 1Descriptive Statistics of Adolescent-Only Treatment Programs ($N = 131$)

	% (N) or Mean (SD)
<i>Tobacco-Related Intake/Assessment Practices</i>	
Asks all adolescents about current tobacco use	97.7% (128)
Advises all current users to quit	71.0% (93)
Assesses all current users' willingness to quit	82.4% (108)
Uses motivational techniques to increase willingness to quit	61.8% (81)
Has adopted all four tobacco-related intake/assessment practices	45.8% (60)
<i>Availability of Smoking Cessation Services</i>	
Offers formal program with pharmacotherapy	13.0% (17)
Offers formal program without pharmacotherapy	15.3% (20)
Offers pharmacotherapy without formal program	14.5% (19)
Offers neither formal program nor pharmacotherapy	57.3% (75)
<i>Organizational Characteristics</i>	
Publicly funded treatment program sample	48.1% (63)
Government-owned treatment organization	15.3% (20)
Center is for-profit	14.5% (19)
Hospital-based program	26.0% (34)
Center is accredited	55.7% (73)
At least one physician on staff	35.9% (47)
Adolescent program has less than 10 employees	44.3% (58)
Number of "best practices" in assessment & treatment matching	2.79 (0.95)
Center offers adolescent-only inpatient care	16.0% (21)
Center offers adolescent-only residential care	19.9% (26)
Program prescribes psychiatric medications to adolescent clients	41.2% (54)
% of adolescent caseload who use tobacco	71.7(24.4)

Table 2

Unadjusted Logistic Regression Coefficients of Adoption of Bundle of Tobacco-Related Intake/Assessment Procedures ($N = 131$)

	b(SE)
Publicly funded treatment program sample	.26 (.35)
Government-owned treatment organization	.68 (.50)
Center is for-profit	.83 (.51)
Hospital-based program	-.76(.42) ⁺
Center is accredited	-.30 (.35)
At least one physician on staff	.33 (.37)
Adolescent program has less than 10 employees	-.07 (.35)
Number of "best practices" in assessment & treatment matching	.46 (.20) [*]
Center offers adolescent-only inpatient care	-.14 (.48)
Center offers adolescent-only residential care	.60 (.44)
Program prescribes psychiatric medications to adolescent clients	.42 (.36)
% of adolescent caseload who use tobacco	-.01 (.01)

⁺ $p < .10$,

^{*} $p < .05$,

^{**} $p < .01$

^{***} $p < .001$ (two-tailed test)

Table 3Unadjusted Multinomial Logistic Regression Coefficients of Smoking Cessation Services ($N = 131$)

	Counseling with Medications $b(SE)$	Only Counseling $b(SE)$	Only Medications $b(SE)$
Publicly funded treatment program sample	-.25 (.54)	.49 (.52)	-2.27 (.78) **
Government-owned treatment organization	-1.39(1.07)	-.35 (.69)	-1.50 (1.07)
Center is for-profit	.69 (.67)	-.33 (.82)	.20 (.71)
Hospital-based program	.05 (.63)	-.97 (.79)	1.55 (.54) **
Center is accredited	.36 (.56)	-1.34 (.57) *	1.08 (.61) +
At least one physician on staff	1.62 (.57) **	-1.19 (.79)	2.04 (.58) ***
Adolescent program has less than 10 employees	-2.15 (.79) **	.71 (.54)	-2.27 (.78) **
Number of "best practices" in assessment & treatment matching	-.57 (.28) *	.05 (.28)	.88 (.35) *
Center has adopted all four tobacco-related intake/assessment procedures	-.17 (.54)	.39 (.51)	-.13 (.52)
Center offers adolescent-only inpatient care	2.52 (.67) ***	.44 (.88)	1.87 (.68) **
Center offers adolescent-only residential care	1.64 (.61) **	-.95(1.09)	1.89 (.58) **
Program prescribes psychiatric medications to adolescent clients	1.99 (.62) **	-1.38 (.79) *	2.49 (.68) ***
% of adolescent caseload who use tobacco	-.01 (.01)	-.02 (.01)	.01 (.01)

The reference category is no smoking cessation services.

+ $p < .10$,* $p < .05$,** $p < .01$,*** $p < .001$ (two-tailed test)