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## Counselors' Knowledge of the Adoption of Tobacco Cessation Medications in Substance Abuse Treatment Programs

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### Abstract

This study assessed counselors' knowledge of the adoption of evidence-based tobacco cessation medications (TCMs) - varenicline, bupropion, and five nicotine replacement therapies (NRTs) - and predictors of adoption in diverse substance abuse treatment settings. We used MERITS I data from 658 counselors working in 26 programs. Adoption of varenicline was reported by 16% of counselors, bupropion by 11%, and NRTs by 27%. Knowledge of the adoption of all types of TCMs was more likely to be reported by counselors who worked in treatment programs that adhered less to a 12-step orientation and restricted outdoor smoking for employees. Several additional unique predictors of varenicline and NRTs were identified.

### INTRODUCTION

Although tremendous strides have been made in decreasing tobacco use among American adults over the past few decades, the prevalence of tobacco use among individuals with substance use disorders (SUDs) continues to be higher (greater than 70%) than among adults without SUDs.<sup>1-4</sup> Reports estimate that 71%–95% of individuals with SUDs are also addicted to tobacco.<sup>5-6</sup> These individuals are more likely to die from tobacco-related diseases (e.g., lung cancer, cardiovascular diseases) than from alcohol and drug related diseases.<sup>7-8</sup> According to results from a systematic review of the literature, smokers with current or former alcohol use disorder (AUD) are more dependent on nicotine than smokers without AUDs.<sup>9</sup> However, smokers with AUD can quit tobacco use as easily as other smokers.<sup>9</sup> Thus, providing tobacco cessation treatment, in addition to alcohol and drug abuse treatment, has many potential short- and long-term health benefits and should be made a high priority.

In an effort to encourage professionals and institutions to help support tobacco cessation in the general population as well as among clients with SUDs, national guidelines have been published.<sup>10</sup> The “*Treating Tobacco Use and Dependence: 2008 Update*” includes recommendations particularly for clinical settings that are made by a private-sectors panel of experts, consortium representatives, and their staff. These updated efforts promote the use of seven evidence-based tobacco cessation medications (TCMs)—varenicline and bupropion, which are non-nicotine medications; the nicotine patch, nicotine gum, nicotine inhaler,

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Declaration of Interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this paper.

nicotine lozenge, and nicotine nasal spray, all of which are considered nicotine replacement therapies (NRTs). The objective of the current study was to examine counselor knowledge of the adoption of these seven TCMs in diverse substance abuse treatment programs and identify predictors of TCM adoption. Considering that the adoption of an innovation is the first step in implementing any practice in substance abuse treatment programs,<sup>11</sup> studying adoption of TCMs is important. Unless decision-makers decide to adopt an evidence-based practice, such as TCMs, sustained implementation is not possible.<sup>12</sup>

TCMs are associated with more positive client outcomes such as increased quit rates, abstinence rates, and decreased cravings.<sup>10</sup> Bupropion and NRT, for instance, double the odds of long-term smoking cessation compared to placebo.<sup>13,14</sup> There is also strong evidence that these nicotine and non-nicotine TCMs are appropriate for and effective in treating individuals with substance use disorders.<sup>15-17</sup> However, as with any medication, clients, particularly those with co-morbid diagnoses, should be closely monitored during treatment.<sup>10</sup>

Despite scientific support of the effectiveness of TCMs, positive outcomes associated with those medications, and much interest in quitting smoking by individuals seeking treatment for other substance use disorders,<sup>10,18-21</sup> the limited published studies show low adoption of TCMs. Treatment programs are often reluctant to prescribe TCMs due to fears of interference with recovery, despite evidence supporting the efficacy of simultaneous treatment of alcohol, drugs, and nicotine.<sup>19,21-24</sup> Staff training and buy-in appear to be essential to adopting and implementing tobacco dependence treatment in substance abuse treatment programs.<sup>25</sup>

In addition, low reports of TCM adoption may be linked to the time of data collection, treatment setting investigated, and type of TCM included in the study. More specifically, integrating tobacco cessation during alcohol and drug use treatment is a relatively new phenomenon that appears to be rapidly expanding. Thus, we may see a greater adoption of TCMs even within a short period. Regarding treatment settings, Friedmann and colleagues, based on program-level data collected between 2004 and 2005, noted that only 17% of outpatient programs used some type of TCM (i.e., NRTs, bupropion, other antidepressant therapy, or both).<sup>26</sup> In contrast, Currie and colleagues, based on data collected in 2001, found that although 54% of Canadian substance abuse treatment programs provided help for patients who wanted to quit smoking, less than 1% offered NRTs or bupropion.<sup>27</sup> NRTs in this study were limited to the nicotine patch and nicotine gum. However, data that are more current and the inclusion of more diverse treatment settings (e.g., correctional facilities, methadone maintenance programs) as well as the entire range of available TCMs may show different TCM adoption rates.

Further limitations of previous research comprise an absence of varenicline, which was not approved by the FDA until 2006, as well as a lack of inclusion of both counselor and organizational characteristics that may predict the adoption of TCMs. Counselor-level characteristics that may be positively associated with adoption of TCMs include counselors' attitudes toward tobacco cessation treatment,<sup>28</sup> an interest in clients' tobacco cessation attempts (i.e., assess clients' willingness to quit smoking; assist clients with smoking cessation), and assessment of clients' smoking status.<sup>10,26</sup> In addition, counselors who smoke and those who are in recovery may be more hesitant to promote clients' tobacco cessation attempts,<sup>29,30</sup> which could predict TCM adoption.

Organizational-level characteristics such as smoke-free policies in buildings and on grounds have shown promising results in decreasing smoking rates<sup>31-33</sup> and may also be linked to TCM use. Williams and colleagues, for example, evaluated the impact of smoking policy

changes in addiction treatment programs in New Jersey on clients, staff, and programs.<sup>25</sup> In 1999, all residential treatment programs were required to maintain tobacco-free facilities and grounds and treat tobacco dependence. In addition, the state provided all programs with free NRTs. Results suggested that policy changes prompted organizational changes. All residential programs offered tobacco cessation treatment to a certain extent, 50% of programs had tobacco-free grounds, 85% of programs used the free NRTs offered by the state, and 65% of clients who smoked expressed an interest in quitting or reducing their tobacco use.<sup>25</sup> Thus, programs with policy directives that either limit tobacco use on grounds or that require tobacco-free facilities and grounds may be more likely to adopt TCMs than other programs.

The purposes of this study then were to (a) assess counselors' knowledge of the adoption of the seven evidence-based TCMs—varenicline, bupropion, and NRTs (nicotine gum, patch, inhaler, nasal spray, and lozenge)—using data from Clinical Trials Network (CTN) affiliated treatment programs collected in 2008; and (b) identify counselor-reported characteristics (treatment setting including correctional facilities, methadone maintenance programs, hospital inpatient programs, non-hospital residential programs, and an "other" programs category; percentage of clients who smoke; extent of assessment of clients' smoking status and promotion of tobacco cessation; and counselors' recovery and smoking status) and organizational characteristics reported by administrators (organization's operational status, 12-step philosophy, emphasis on medical/psychiatric model of addiction, and smoking policies) that may predict counselors' knowledge of the adoption of TCMs.

In an effort to gap the bridge between innovation and adoption of evidence-based practices, the National Institute on Drug Abuse (NIDA) established the Clinical Trials Network (CTN). The objective of the CTN is for researchers and community-based professionals to work together to improve the quality of substance abuse treatment by reviewing the effectiveness of innovations and then delivering innovative technologies into clinical practices.<sup>34</sup> This makes CTN-affiliated substance abuse treatment programs ideal settings for investigating the adoption of evidence-based TCMs.

## METHOD

### Study Design

The national data for this study were derived from the Managing Effective Relationships in Treatment Services (MERITS I) project, which was conducted by researchers affiliated with the University of Georgia's Institute for Behavioral Research. MERITS I is a NIDA-funded longitudinal project that utilizes the Clinical Trials Network (CTN) as a platform to provide an in-depth understanding of the experiences of full-time counselors and clinical supervisors that are employed in 111 substance abuse treatment programs affiliated with 26 treatment organizations across the U.S. A treatment program is defined as a relatively autonomous, free-standing operational unit. Treatment organizations are organizational structures with oversight and authority over participating treatment programs. To participate in the study, eligible treatment organizations had to provide drug abuse counseling services in a community-based setting. This excluded prison-based programs, Veteran's Health Administration programs, and driving-under-the-influence schools. Eligible counselors had to have direct contact with clients in a therapeutic relationship (individual or group counseling sessions, or both) and eligible clinical supervisors had to provide written and/or face-to-face clinical supervision to counselors.

The current study utilizes second wave data that were collected in 2008 (baseline data were collected in 2007), which is the first wave for which in-depth information was obtained on tobacco cessation treatment and medications. Data were collected in person via paper-and-

pencil surveys in 111 CTN-affiliated community treatment programs that were affiliated with 26 unique treatment organizations. Counselor-level data were obtained from 658 counselors (74% response rate); organizational-level data were acquired from 26 organizational representatives (100% response rate), most of whom held the job title of Chief Executive Officer, Director, or Vice President. All procedures were approved by the University of Georgia's Institutional Review Board.

## Sample

Counselor reports indicated that 5% ( $n = 32$ ) worked in a correctional facility, 18% ( $n = 118$ ) in a methadone maintenance clinic, 10% ( $n = 62$ ) in a hospital inpatient/detox program, 29% ( $n = 184$ ) in a non-hospital residential program, and 38% ( $n = 243$ ) in an "other" setting (e.g., non-methadone outpatient). In addition, 43% ( $n = 275$ ) of counselors noted that they were in recovery and 26% ( $n = 174$ ) were current smokers. A mean of 73% ( $SD = .27$ ) of clients were reported to be smokers. In terms of clients' smoking status assessment and cessation promotion, counselors did not consistently assess their clients' smoking status or promote their clients' tobacco cessation efforts ( $M = 3.10$ ,  $SD = 1.10$  and  $M = 3.13$ ,  $SD = 1.19$ , respectively, on a 0 = *never* to 5 = *always* scale).

Administrator reports showed that 12% ( $n = 3$ ) of organizations operated as for-profit organizations and 17% ( $n = 4$ ) were primarily based on a 12-step model. Regarding smoking policies, 96% ( $n = 24$ ) of organizations prohibited clients from smoking indoors, 80% ( $n = 20$ ) restricted clients to smoking outdoors in designated areas, 96% ( $n = 24$ ) prohibited employees from smoking indoors, and 52% ( $n = 13$ ) restricted employees to smoking outside in designated areas. Participating treatment organizations reported moderate levels of adherence to the medical model of addiction ( $M = 3.36$ ,  $SD = 1.09$  on a 1 = *no extent* to 5 = *very great extent* scale).

## Dependent Variables

We considered seven dependent variables (DVs) that measured counselors' knowledge of the adoption of the seven recommended evidence-based TCMS<sup>9</sup> in their respective treatment programs. Counselors were asked, "Are any of the following medications prescribed or dispensed by medical staff in your treatment center to help clients achieve tobacco cessation?" The list of medications included varenicline (Chantix<sup>®</sup>), bupropion, nicotine gum, nicotine patch, nicotine inhaler, nicotine nasal spray, and nicotine lozenge. Response options were no/yes (coded 0/1). Exploratory factor analysis with promax rotation was conducted for the five NRTs, using the method of iterated factor analysis, in an attempt to reduce the number of DVs. The variables loaded on 1 factor according to the minimum eigenvalues criterion of greater than 1. NRTs were subsequently combined and coded 1 if any of the five NRTs were prescribed; otherwise NRTs were coded 0 ( $\alpha = .84$ ). Thus, we examined the adoption of three TCMS (DVs)—varenicline, bupropion, and NRTs.

## Independent Variables

Administrator-reported predictors included the organizations' profit status, 12-step-based philosophy, emphasis on a medical/psychiatric model of addiction, and smoking policies for clients and employees. Counselor-reported predictors included treatment setting, percentage of clients who smoke, counselors' extent of assessment of client smoking status, counselors' promotion of client tobacco cessation, counselors' recovery status, and counselors' smoking status.

More specifically, treatment organizations' operational status was coded 0 for *non-profit* and 1 for *for-profit*. Organizations' treatment philosophy was coded 0 for *primarily based on a non-12-step model* (i.e., primarily based on cognitive behavioral therapy, motivational

enhancement therapy, or eclectic/mixed model) and 1 for *primarily based on a 12-step model*. The extent to which the organization emphasized a medical/psychiatric model of addiction was assessed using a Likert-type scale where 1 = *no extent* and 5 = *very great extent*. Organizations' smoking policies were assessed with two no/yes (0/1) items: Outdoor smoking is restricted for clients to designated areas; and outdoor smoking is restricted for employees to designated areas. Indoor smoking policies were not included in the analyses due to statistical considerations, because almost all programs (96%) prohibited clients and employees from smoking indoors.

Treatment setting options were dummy coded and included correctional facility, methadone maintenance/opioid treatment program, hospital inpatient/detox program (reference group), non-hospital residential program, and "other" (e.g., non-methadone outpatient). The percentage of clients at the program who smoked was measured as a continuous variable ranging from .00 to 1.00. The extent to which counselors report assessing client current smoking status and interest in quitting was measured by calculating the mean across six items (e.g., "How often do you personally...ask new clients whether they are current tobacco users; assess current tobacco users for their willingness to quit?"<sup>32</sup>). Response options were 0 = *never* to 5 = *always* ( $\alpha = .87$ ). The extent to which counselors try to promote client tobacco cessation was assessed by calculating the mean across seven items (e.g., "To what extent do you personally...give clients the number of a quit-line?"<sup>35</sup>). Response options ranged from 0 = *never* to 5 = *always* ( $\alpha = .93$ ). Counselors also reported if they were personally in recovery (0 = *no*, 1 = *yes*). Counselors' smoking status was measured with the question, "During the past 30 days, on how many days did you smoke cigarettes?" (0 days = *non-smoker*, 1+ days = *smoker*).

## Data Analyses

Data were analyzed using SAS 9.2. Descriptive statistics were performed for all variables to check for normality and outliers. The DVs—counselors' knowledge of the adoption of the three TCMs—are presented in Table 1. Administrator-reported data were disaggregated to the counselor-level, because our interest was in understanding counselors' knowledge of the adoption of TCMs in their treatment programs. However, because counselors are nested within programs, we controlled for these multi-level effects. Logistic regression models with correlated data (SAS PROC GENMOD) using the method of generalized estimating equations (GEE) were run separately for each of the three DVs to identify counselor- and administrator-reported predictors of the adoption of varenicline, bupropion, and NRTs (see Table 2). Statistical tests prior to the analyses did not indicate multicollinearity issues. Missing data were imputed for logistic regression models using the SAS Multiple Imputation procedure (Table 2).<sup>36</sup>

## RESULTS

### Counselors' Knowledge of the Adoption of TCMs

The vast majority of substance abuse treatment programs had not yet adopted evidence-based TCMs. According to counselor reports, 16% of programs prescribed varenicline, 11% used bupropion, and 27% dispensed NRT to help clients achieve tobacco cessation (see Table 1). Additional analysis of the five individual NRTs that were combined into one NRT variable indicated that 25% ( $n = 164$ ) of counselors noted that their programs prescribed the nicotine patch, 16% ( $n = 105$ ) used nicotine gum, 9% ( $n = 56$ ) dispensed nicotine lozenge, 5% ( $n = 31$ ) prescribed a nicotine inhaler, and 3% ( $n = 20$ ) used a nicotine spray.



## Predictors of Counselors' Knowledge of the Adoption of TCMs

As displayed in Table 2, two variables consistently predicted counselor knowledge of all three types of TCM adoption. First, counselors working in 12-step-based organizations were less likely than those in other organizations to report that any of the three TCMs were prescribed. Second, treatment organizations that restricted employee outdoor smoking to designated areas were more likely than other organizations to adopt any of the three TCMs. Two additional characteristics significantly predicted varenicline use and two other characteristics were significantly related to NRT adoption.

**Varenicline**—Counselors working in for-profit treatment organizations and organizations with a greater emphasis on the medical model of addiction were more likely than counselors in other organizations to report that varenicline was prescribed. In addition, counselors working in organizations where a larger proportion of their clients smoked were less likely to report that varenicline was prescribed. Finally, counselors who smoked were less likely to report the use of varenicline in their treatment program.

**Nicotine Replacement Therapy (NRT)**—Counselors working in for-profit organizations were more likely to report the adoption of NRT than other counselors. In addition, counselors working in methadone maintenance versus non-hospital residential treatment settings were less likely to report the adoption of NRT.

## DISCUSSION

The purposes of this study were to assess counselors' knowledge of the adoption of the recommended evidence-based TCMs—varenicline, bupropion, and nicotine replacement therapy (i.e., nicotine patch, gum, lozenge, nasal spray, and inhaler)—and identify predictors of TCM adoption in diverse Clinical Trials Network (CTN) affiliated treatment programs. Three general conclusions can be reached from our findings. First, the adoption of TCMs is generally low according to counselor reports. Second, there were two variables that predicted all three types of TCM adoption as reported by counselors—organizations having less of an emphasis on the 12-step model of recovery and organizations that restricted outdoor smoking for employees. Third, there were several unique predictors of the adoption of specific TCMs, suggesting some different sources of influences and the need for further investigations.

### Counselors' Knowledge of Adoption of TCMs

Although adoption of TCMs was low overall based on counselor reports, there is some indication that TCM may be expanding compared to previous findings. Friedmann and colleagues as well as Currie and colleagues noted lower rates of TCM adoption based on program level data rather than counselor reports.<sup>26,27</sup> It is important to further point out that differences in study designs (treatment settings, type of TCM use studied, sample size) may also account for the variation. We considered geographical area as an additional control variable (Northeast, Midwest, South, West); however, no statistically significant effects were found. In addition, Rogers' theory on the diffusion of innovations would suggest that adoption of TCMs increases over time as more organizations and counselors become aware of these innovations.<sup>12</sup> Our data were collected in 2008 compared to 2004/05 in Friedmann et al.'s study and 2001 in Currie et al.'s study.<sup>26,27</sup> Thus, the slightly higher rate of TCM adoption could also reflect a history effect—more programs had time to adopt TCMs.

### Predictors of Counselors' Knowledge of TCM Adoption

First, counselors working in organizations that were more focused on a 12-step philosophy were less likely than those working in other organizations to report that TCMs were adopted.

The focus of 12-step-based organizations has historically been on total abstinence from alcohol and drugs, and medication-assisted treatment (MAT) used to be viewed as a substitute for other drugs. Today, many 12-step-based organizations have become more receptive to MAT in addition to rather than in lieu of other therapeutic interventions (e.g., counseling, cognitive behavioral therapy). As adoption of TCMs becomes more prevalent in the addiction field, 12-step-based organizations may also increase their use of diverse pharmacotherapies. Ways of increasing TCM adoption could include focusing on overcoming staff resistance and negative attitudes toward medication use; educating and training administrators, staff, and clients on the use, benefits, and risks of TCMs;<sup>25</sup> and stressing the compatibility between the 12-step-based philosophy and treatment innovations for clients who cannot otherwise achieve tobacco abstinence (short-term medication use for long-term tobacco abstinence).

Second, counselors working in organizations that restricted outdoor employee smoking were more likely than those not working in such organizations to report that their treatment program adopted TCMs. No similar relationship was found for client smoking policies and TCM use. One explanation for this finding could be that organizations that are more restrictive are more receptive to TCM innovations and adoption. As a result, they may place a greater emphasis on tobacco cessation among employees whose behavior can set standards for clients. In addition, previous research has found lower rates of smoking in settings that prohibited indoor and outdoor smoking<sup>31,33</sup> and an increase in tobacco dependence treatment along with NRT use as a result of tobacco-free standards.<sup>25</sup>

### Limitations and Conclusion

Limitations of our study should be taken into consideration when interpreting the results. First, data were collected from counselors and administrators affiliated with the CTN, which is not a nationally representative sample. Previous findings indicated demographic differences between counselors working in CTN-affiliated programs and counselors from nationally representative organizations.<sup>37</sup> However, the demographic characteristics were not linked to the measures in the model, suggesting limited bias. In addition, there are indications that the CTN-affiliated programs represent diverse cross-sections of substance abuse treatment programs. Specifically, the CTN includes CTPs from all major treatment modality (e.g., drug-free outpatient, short-term and long-term residential, methadone maintenance). CTN nodes are also located in 26 states in every major geographic region of the country.

Second, the cross-sectional data used in this study cannot be used to determine causality. MERIT I is a longitudinal study, but the current wave is the first to collect TCM-related data. Future data collection efforts may allow us to track changes in and additions to the adoption of TCMs over time and examine additional predictors of and barriers associated with diverse types of TCM adoption. Third, missing data pose a general concern and limitation to researchers. Missing data in our study appeared to be missing at random; thus, multiple imputation was an appropriate statistical method to use.

In conclusion, despite evidence of the effectiveness of TCMs, adoption of TCMs in substance abuse treatment programs remains low. The high percentage of clients with SUDs who smoke and smoking-related health risks highlight the necessity for continuing to educate individuals working in the substance use disorder field as well as clients in treatment about the benefits of adopting evidence-based TCMs. More research in this area is needed to continue to identify and better understand predictors (and barriers) of diverse types of TCM adoption.

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**TABLE 1**

Counselor's knowledge of adoption of tobacco cessation medications (TCMs) in substance abuse treatment programs

	<b>TCM Adopted</b>	
	<b>Yes</b>	<b>No</b>
Varenicline ( <i>N, %</i> )	103 (16)	555 (84)
Bupropion ( <i>N, %</i> )	71 (11)	587 (89)
Nicotine Replacement Therapy ( <i>N, %</i> )	176 (27)	482 (73)

Parameter estimates for logistic regressions with correlated data using multiple imputations: Counselors' knowledge of adoption of tobacco cessation medications (TCMs)

TABLE 2

Variable	Varenicline Use			Bupropion Use			NRT Use		
	B	SE	t	B	SE	t	B	SE	t
For-Profit Organization	1.53	.78	1.97*	.97	.67	1.45	1.27	.32	4.00***
Primarily 12-Step-Based	-1.40	.57	-2.44*	-1.05	.51	-2.04*	-2.72	.42	-6.47***
Medical Model of Addiction	.36	.18	2.03*	-.02	.18	-.09	-.06	.15	-.39
Outdoor Smoking for Clients	-.68	.48	-1.41	.51	.53	.97	.61	.62	.99
Outdoor Smoking for Employees	1.63	.57	2.86**	.99	.43	2.26*	1.21	.52	2.30*
Treatment Setting									
Correctional Facility	.43	.37	1.17	-.05	.40	-.14	.29	.45	.65
Methadone maintenance	.42	.39	1.09	.42	.42	1.01	-.93	.47	-1.97*
Hospital inpatient/detox	.96	.73	1.31	-.10	.61	-.16	-.78	.60	-1.29
Non-Hospital Residential	Reference Group	Reference Group	Reference Group	Reference Group	Reference Group	Reference Group	Reference Group	Reference Group	Reference Group
"Other"	.59	.56	1.06	-.20	.83	-.24	-.98	.60	-1.63
% Clients who Smoke	-.76	.37	-2.07*	-.29	.50	-.59	-.46	.41	-1.13
Assess Clients' Smoking Status	-.17	.17	-1.04	-.16	.18	-.93	-.21	.15	-1.41
Promote Clients' Cessation	.01	.16	.06	-.02	.13	-.12	-.02	.12	-.16
Counselor in Recovery	-.22	.29	-.75	-.29	.27	-1.06	.14	.19	.72
Counselor Smokes	-.51	.24	-2.13*	-.19	.38	-.50	-.24	.34	-.70

\*  $p < .05$ ;\*\*  $p < .01$ ;\*\*\*  $p < .001$ .