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Differences in Substance Abuse Counselors' Knowledge of Tobacco Cessation Medication Effectiveness: 2002–2008

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Abstract

Counselors play a supportive role in patients' substance abuse treatment, including tobacco cessation. Thus, counselors should be knowledgeable about tobacco cessation medications (TCMs). This study examined differences in counselors' knowledge of and familiarity with (i.e., diffusion) bupropion and nicotine replacement therapy (NRT) between 2002 and 2008 and identified predictors of diffusion. Repeated cross-sectional questionnaire data were obtained in 2002/04 from 992 counselors and in 2007/08 from 1,226 counselors working in private treatment programs. Results indicated that more counselors in 2007/08 did not know about bupropion to rate its effectiveness than in 2002/04; no differences were found for NRT. Among both samples of counselors who were familiar with TCMs, effectiveness was rated higher in 2007/08 than in 2002/04. Findings suggest that educated and trained counselors are important in diffusing TCMs. Knowledgeable counselors may be able to educate patients interested in tobacco cessation about available treatments and encourage compliance with TCMs.

Introduction

Tobacco use among patients in treatment for substance use disorders is pandemic. Patients are more likely to die from tobacco-related illnesses than from alcohol-related illnesses (Hurt et al., 1996). The good news is that between 44% and 80% of patients in treatment express an interest in quitting smoking (Richter, Gibson, Ahluwalia, & Schmelzle, 2001; Zullino, Besson, & Schnyder, 2000). In addition, diverse evidence-based tobacco cessation medications (TCMs) have been recommended for use with this population (Fiore et al.,

2008). Navigating through the array of treatment options can, however, be challenging. Substance abuse counselors, while they cannot prescribe medications, can play pivotal roles in patients' participation in medication assisted therapy and their adherence to medication regimens. Counselors are the “first-line” in the implementation of treatment plans, interacting with patients far more than physicians or other personnel in the treatment center. Their endorsements of medications may be critical for either compliance or non-compliance by patients. Thus, counselors need to be knowledgeable about TCMs in order for prescriptions by physicians to lead to treatment implementation and to ultimately enhance patient outcomes (King & Anderson, 2004).

Assessing counselors' knowledge of TCMs, the focus of this study, is important for two main reasons: First, it is necessary for understanding the diffusion of innovations or spread of knowledge. According to Rogers' (1995, p. 5) theory of *Diffusion of Innovations*, “Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system.” Knowledge is one step in the diffusion process and indicates that people become aware of an innovation such as the existence and effectiveness of TCMs. Thus, a large percentage of counselors who are familiar with and can rate the effectiveness of TCMs would indicate a great extent of diffusion. In addition, a large percentage of counselors who do not know about TCMs and cannot comment on their effectiveness would suggest a low degree of diffusion.

Second, in substance abuse treatment research a link has been revealed between counselors' knowledge of medication effectiveness and their support of patients' medication use (Thomas, Wallack, Lee, McCarty, & Swift, 2003). Thus, counselors' knowledge of TCMs can have implications for patient outcomes, because counselors guide patients through the maze of available treatment options. Considering that the spread of knowledge occurs over time and innovations diffuse slowly in substance abuse treatment (Sloboda & Schildhaus, 2002), we examined differences in both counselors' knowledge of bupropion and NRT effectiveness and lack of familiarity with both TCMs to rate their effectiveness between 2002 and 2008. We also identified individual- and organization-level predictors of diffusion.

Tobacco Cessation Medications

There are currently two types of Federal Drug Administration (FDA) approved TCMs recommended for tobacco cessation: non-nicotine therapies, including bupropion and varenicline, and nicotine replacement therapies, including nicotine patch, gum, lozenge, nasal spray, and inhaler. Bupropion (Zyban™) was approved by the FDA in 1997 for use as a tobacco cessation medication and has been shown to decrease the severity of cravings and withdrawal symptoms as well as increase long-term tobacco abstinence (Fiore et al., 2008; Tonnesen et al., 2003). Varenicline (Chantix™) has been approved by the FDA in 2007 and has also shown to be efficacious (Jorenby et al., 2006). NRT delivers nicotine with the intention of decreasing withdrawal symptoms, replacing nicotine from cigarettes, and increasing long-term tobacco cessation (Fiore et al., 2008). Considering that varenicline has only been approved since 2007 and our interest is in differences in diffusion over time, we limited our investigation to the diffusion of bupropion and NRT (i.e., nicotine gum and patch) between 2002 and 2008.

Research on Diffusion of Pharmacotherapy among Counselors

Health services researchers have been attracted to studying various facets of the utilization of substance abuse treatment organizations as platforms for delivering services for tobacco and nicotine dependence (Currie, Nesbitt, Wood, & Lawson, 2003; Friedmann, Jin, & Richter, 2008; Fuller et al., 2007; Richter, Choi, McCool, Harris, & Ahluwalia, 2004). However, no research to date has examined the diffusion of TCMs among counselors either cross-sectionally or longitudinally. In addition, research on pharmacotherapy diffusion among counselors is sparse. Thomas and Miller (2007), for instance, administered a naltrexone knowledge test to 66 counselors and 18 administrators working in six community-based treatment programs. Few respondents were knowledgeable about naltrexone such as treatment use, insurance coverage, and effectiveness. Positive predictors of knowledge were experience in the field and level of education.

Similar lack of knowledge about pharmacotherapy among substance abuse counselors was reported by Knudsen, Ducharme, Roman, & Link (2005) who studied the diffusion of buprenorphine for the treatment of opiate addiction. They surveyed 2,298 counselors working in private and public sector treatment programs. Results showed a low level of diffusion with two thirds of counselors stating that they did not know about buprenorphine to rate its effectiveness. Predictors of diffusion included training on the use of buprenorphine and counselors' professional development including level of education and years of experience in the field.

Further, Abraham, Ducharme, and Roman (2009), using 2006 questionnaire data from 1,140 counselors working in public sector treatment programs, examined the diffusion of three pharmacotherapies for alcohol dependence (i.e., disulfiram, tablet naltrexone, acamprosate). Knowledge of alcohol medications was associated with the passage of time since FDA approval. That is, 28% of counselors did not know about disulfiram (the oldest medication on the market) to rate its effectiveness, 58% of counselors did not know about naltrexone, and 76% of counselors did not know about acamprosate (the newest medication on the market). The main predictor of diffusion of alcohol medications in Abraham and colleagues study was the counselors' specific training in the use of the three pharmacotherapies for alcohol dependence.

Similar to prior research on the diffusion of buprenorphine, naltrexone, acamprosate, and disulfiram (Abraham et al., 2009; Knudsen et al., 2005; Thomas & Miller, 2007), the present study measures diffusion in two ways:

1. Counselors' familiarity with bupropion and NRT and counselors' rating of their effectiveness.
2. Counselors' lack of familiarity (i.e., don't know responses) with either TCM, and thus no counselors' effectiveness rating.

We hypothesize that (H1) because of the effects of time on the processes of diffusion (Rogers, 1995), knowledge of bupropion and NRT effectiveness will be greater between counselors in the second sample (2007/08) than in the first sample (2002/04), and (H2) also reflecting diffusion, lack of familiarity with bupropion and NRT to rate their effectiveness

will be lower between counselors in the second sample (2007/08) than in the first sample (2002/04).

In addition, based on previous studies (Abraham et al., 2009; Currie et al., 2003; Friedmann et al., 2008; Fuller et al., 2007; Knudsen et al., 2005; Richter & Arnsten, 2006; Richter et al., 2004; Roman & Johnson, 2002; Thomas & Miller, 2007) we hypothesize that (H3) counselor characteristics (demographics and professional credentials) will be associated with counselors' knowledge of bupropion and NRT effectiveness; (H4) organization-level characteristics will be associated with counselors' knowledge of the effectiveness of bupropion and NRT; (H5) counselor characteristics will be associated with lack of familiarity with these TCMs; and (H6) organization-level characteristics will be associated with counselors' lack of familiarity with these TCMs.

Methods

Sample and Study Design

The two panels of data for the current study were drawn from separate samples of counselors participating in the 2002/04 and 2007/08 national private treatment center study, conducted by the University of Georgia's Institute for Behavioral Research. This study, which began in 1994, identifies changes in service delivery within privately funded community-based substance abuse treatment programs. Programs were defined as “private sector” if they received at least 50% of their annual operating revenues from commercial insurance, patient fees, and income sources other than government grants or contracts. Medicaid and Medicare, which are reimbursements received by programs on an individual patient basis, were not regarded as “block” funding. Eligible programs were required to offer alcohol and drug treatment at a level of intensity at least equivalent to American Society of Addiction Medicine (ASAM) outpatient services and be located within the community. Programs based in correctional facilities, operated by the Veteran's Administration, and those offering only detoxification or methadone maintenance were excluded. All procedures were approved by the University of Georgia's Institutional Review Board.

Participating organizations were selected via a two-stage random sampling approach. First, all U.S. counties were assigned to 1 of 10 strata based on population and randomly sampled within strata to ensure the inclusion of urban, suburban, and rural areas. Second, using national and state directories, all substance abuse treatment facilities in the sampled counties were enumerated. Treatment programs were then proportionately sampled across strata, with telephone screening used to establish eligibility for the study. Facilities screened as ineligible were replaced by random selection of alternative centers from the same geographic stratum. Samples are sustained over time, with random replacements from the same strata of programs that have closed or become ineligible for other reasons. Thus the two-stage sampling strategy provides for both overlap and difference between samples drawn over time, with a longitudinal sample embedded within a cross-sectional national panel.

Organization-level data were collected in face-to-face interviews with administrators and directors. They then supplied a list of counselors working in their programs. Counselors who

agreed to participate in our study then completed a mailed questionnaire. From the 2002/04 study, 992 counselors from 217 private programs were included in the analyses; in 2007/08, 1,226 counselors from 254 private programs were included in the analyses. The response rate was 62% in 2002/04 and 58% in 2007/08.

Dependent Variables

We examined four dependent variables for each sample—counselors' knowledge of the effectiveness of (1) bupropion and (2) NRT (i.e., patch and gum) in 2002/04 and 2007/08; and lack of familiarity with (3) bupropion and (4) NRT to rate their effectiveness in 2002/04 and 2007/08. Knowledge of the effectiveness of bupropion and NRT was measured with the question, “Based on your knowledge and personal experience, to what extent do you consider the following treatment techniques to be effective...” Bupropion and NRT, including nicotine patch and gum, were among a list of pharmacotherapies and psychosocial therapies. Responses ranged from 1 = not at all effective to 7 = very effective. Greater knowledge of the effectiveness would indicate higher diffusion. The NRT variable was created by calculating the mean for nicotine gum and patch ($r = .72$).

Counselors also had the option to select “Don't Know” if they were unable to rate the effectiveness of the medications, which represents lack of familiarity with a particular TCM. Lower percentages of “Don't Know” responses indicate higher diffusion. Lack of familiarity was coded as a binary variable (0 = *know about treatment* and 1 = *don't know about treatment*). “Don't know” responses were excluded from the knowledge of effectiveness analyses; thus, the number of responses varies.

Independent Variables

Counselor demographic characteristics included sex (0 = *male*, 1 = *female*), race/ethnicity (0 = *racial/ethnic minority*, 1 = *non-Hispanic White*), recovery status (0 = *not in recovery*, 1 = *in recovery*), and age in years. Counselor professional credentials included certification in substance abuse counseling (0 = *no*, 1 = *yes*), highest level of education (1 = *High School* is the reference group, 2 = *college*, 3 = *master's degree and higher*), years of experience in the substance abuse field, and extent of training related to bupropion and NRT. Training was assessed with the question, “To what extent have you received specific training about using each of the following treatment techniques...?” Bupropion, nicotine patch, and nicotine gum were again among a list of pharmacotherapies and psychosocial therapies. Responses ranged from 1 = *no training received* to 7 = *extensive training received*. In the second wave but not the first wave of data collection, an alternative response option—*don't know*—was given. For purposes of this study, *don't know* responses were re-coded to 1 = *no training received*. Values for this variable are similar between 2002/04 and 2007/08. The variable “Extent of training in NRT use” was created by calculating the mean for nicotine patch and gum training ($r = .92$).

Additionally, we explored five organization-level characteristics based on data that were collected in separate in-person interviews from counselors' administrators and/or clinical directors ($N = 217$ in 2002/04 and $N = 254$ in 2007/08). Characteristics included profit status (0 = *non-profit* and 1 = *for-profit*); hospital-based ownership coded 0 = *no* (freestanding unit

NOT on a hospital campus) and 1 = *yes* (freestanding unit on a hospital campus, unit/department within a psychiatric hospital, and unit/department within a general or other hospital); the percentage of patients that receive bupropion (square root transformed to achieve normality); the percentage of patients that receive NRT (mean score of nicotine patch and gum, $r = .74$; square-root transformed to achieve normality); endorsement of a primarily 12-step based orientation to treatment (0 = *no*, 1 = *yes*); and program teaches smoking cessation techniques (0 = *no*; 1 = *yes*). Organization-level data were disaggregated to the counselor level.

Analyses

The repeated cross-sectional data were analyzed using SAS 9.2. Chi-square analyses and *t*-tests were used to compare sample characteristics for counselors in 2002/04 and 2007/08 (see Table 1) and to address hypothesis 1 and 2 (see Table 2). In order to answer the remaining hypotheses, we conducted ordinary least squares (OLS) multiple regressions (H3, H4) and logistic regressions (H5, H6) (see Tables 3 and 4). Prior to data analysis, we examined the variance inflation factors (VIFs) and found no indication of multicollinearity issues. In addition, we calculated the intra-class correlations (ICCs) because of the use of both individual- and organization-level variables. The ICCs ranged from .019 to .070 (i.e., < 10%), supporting the use of OLS and logistic regression without correlated data (Kreft & de Leeuw, 1998). Due to the large number of statistical comparisons and the associated concern over introducing Type I errors, we use a significance level of .01 for all regression analyses. In addition to these analyses and despite the low ICCs, we repeated all analyses using correlated data models with the method of generalized estimating equations (GEE) and found no differences in the outcomes; estimates and standard errors slightly varied (not shown).

Results

Counselor Descriptive Statistics

Differences in counselor characteristics between the two samples are presented in Table 1. There were more male and fewer female counselors in the later sample compared to the earlier sample. In addition, fewer counselors were in recovery in the second compared to the first sample. Level of education also differed between samples with more counselors holding master's degrees in 2007/08 versus 2002/04. Finally, counselors in the latter sample had more years of experience in the field, as well as training in NRT use than counselors in the first sample. No significant differences between samples were found regarding race/ethnicity, certification in substance abuse counseling, age, and bupropion training.

Program Descriptive Statistics

Counselors in 2002/04 worked in 217 private substance abuse treatment programs. According to administrator reports, 63 (29%) programs operated as for-profit organizations, 105 (49%) were hospital-based, 98 (46%) taught tobacco cessation techniques, and 51 (24%) endorsed a primarily 12-step-based orientation to treatment. A mean of 5.54% ($SD = 11.17$) patients who smoked received bupropion and a mean of 6.05% ($SD = 13.48$) patients

who smoked received NRT. In 2007/08, counselors worked in 254 private substance abuse treatment programs. Based on administrator reports, 96 (38%) programs operated as for-profit organizations, 75 (30%) were hospital-based, 129 (51%) taught tobacco cessation techniques, and 64 (25%) endorsed a primarily 12-step-based orientation to treatment. A mean of 2.33% ($SD = 9.92$) patients who smoked received bupropion and a mean of 6.15% ($SD = 17.70$) received NRT.

Diffusion: Knowledge of and Familiarity with TCMs

Our first hypothesis—knowledge of bupropion and NRT effectiveness will be greater in the second sample (2007/08) than in the first sample (2002/04)—was supported (see Table 2). However, our second hypothesis—lack of familiarity with (i.e., don't know responses about) bupropion and NRT to rate their effectiveness will be lower between counselors in the second sample than in the first sample—was not supported (see Table 2). Contrary to our expectations, significantly more counselors in the second (44%) compared to the first (38%) sample selected “don't know” about bupropion. There was no significant difference in the percentage of counselors who responded “don't know” about NRT in 2002/04 (17%) compared to 2007/08 (19%).

Knowledge of TCMs: Counselor and Organization Characteristics

The hypotheses that counselor characteristics (H3) and organization characteristics (H4) will be associated with counselors' knowledge of bupropion and NRT effectiveness were partially supported (Table 3). Counselors with a greater extent of training in the use of bupropion and NRT had greater knowledge of the effectiveness of both TCMs compared to counselors with less training. Further, differences were found within rather than between the two samples based on level of education: Counselors in 2002/04 with a master's degree or higher had more knowledge of the effectiveness of bupropion and NRT than did counselors with a high school degree. In contrast, education did not predict TCM knowledge among counselors in 2007/08. We found no other consistent counselor or organization predictors between or within samples for bupropion and NRT knowledge.

In 2007/08 but not 2002/04, racial/ethnic minority counselors compared to non-Hispanic White counselors and older versus younger counselors had greater knowledge of NRT effectiveness. Conversely, in 2002/04 but not 2007/08, fewer certified counselors had knowledge of NRT effectiveness. In terms of bupropion, in 2002/04 counselors with more years of experience in the field had less effectiveness knowledge than their counterparts with less experience. Finally, counselors in 2007/08 who worked in programs that taught tobacco cessation techniques had more knowledge about bupropion effectiveness than counselors in other programs.

Lack of Familiarity with TCMs: Counselor and Organization Characteristics

The hypotheses that counselor characteristics (H5) and organization characteristics (H6) will be associated with counselors' lack of familiarity with bupropion and NRT effectiveness were also partially supported. In 2002/04 and 2007/08, counselors with less training in the use of bupropion were .58 times and .47 times, respectively, more likely than counselors with more training to select “don't know.” Similarly, in 2002/04 and 2007/08, counselors

with less training in the use of NRT were .64 times and .47 times, respectively, more likely than counselors with more training to select “don't know.” The only additional predictor of diffusion was found in the 2002/04 sample: Counselors' in recovery were 1.60 times less likely than counselors not in recovery to select “don't know” about bupropion.

Discussion

Counselors can play an important supportive role in helping patients navigate the myriad of treatment options including pharmacotherapy for tobacco cessation (King & Anderson, 2004). Their support of physician-prescribed medications can be vital for patient (non) compliance. Thus, counselors need to be familiar with and knowledgeable about tobacco cessation medications (TCMs). The current study examined the diffusion of TCMs based on differences in the knowledge of and lack of familiarity with bupropion and NRT between two samples of counselors working in private substance abuse treatment programs between 2002 and 2008. In addition, we assessed counselor- and organization-level predictors of TCM diffusion.

Our results indicated that more counselors were unfamiliar with bupropion in 2007/08 than in 2002/04, which was contrary to our expectations. Moreover, no differences were found for NRT diffusion, which is also unexpected. Rogers' (1995) theory of diffusion of innovations stipulates that diffusion occurs over time. Thus, we expected fewer counselors to select “don't know” about a medication's effectiveness over time. Bupropion was approved by the FDA in 1997, providing counselors with ample time to become familiar with this type of TCM in order to rate its effectiveness. It may be that the high cost of bupropion and general lack of insurance coverage for medication assisted therapy is related to counselors' lack of knowledge. More research is needed to better understand the diffusion of TCMs as it pertains to counselors' lack of TCM familiarity.

However, among counselors who were familiar with both TCMs and could rate their effectiveness, counselors in the later sample were more knowledgeable about bupropion and NRT effectiveness than were counselors in the first sample. These findings suggest that diffusion, as measured by counselors' familiarity and effectiveness ratings, is occurring and that the gap between research and practice is being addressed, at least as it pertains to TCMs in our two samples. It is vital that innovations are communicated to counselors and then continue to be promoted to ensure diffusion of knowledge. This is especially important considering that diffusion precedes the adoption and implementation of innovations. Treatment programs, conferences, workshops, on-line education, and other channels can act as catalysts for diffusing knowledge about TCMs.

In fact, our findings showed that training in the use of TCMs and counselors' education level were the main predictors of knowledge of and lack of familiarity with bupropion and NRT effectiveness within both samples. That is, counselors with greater training in the use of TCMs and master's level degrees were more knowledgeable about medication effectiveness and were less likely to be unfamiliar with TCMs. Studies on diffusion of other types of medication assisted therapies in substance abuse treatment such as naltrexone, buprenorphine, acamprosate, and disulfiram indicated similar predictors (Abraham et al.,

2009; Knudsen et al., 2005; Thomas & Miller, 2007). Thus, attempts at pharmacotherapy diffusion should focus on intense training of counselors in the use of TCMs.

Finally, there were no clear patterns of organization-level and other counselor-level predictors besides level of education and training either across or within samples and by type of TCM, making it difficult to draw meaningful conclusions and provide noteworthy explanations. However, since this is the first study to address diffusion of TCMs in two samples of counselors and to consider individual and organization-level characteristics that predict TCM diffusion, our findings support more research in this area. For example, our mixed findings suggest unique processes that underlie the diffusion of particular TCMs among both samples of counselors. Future research may help shed light on the distinctive barriers and facilitators of bupropion and NRT diffusion.

Limitations and Conclusion

As with any research, limitations of our study need to be taken into consideration when attempting to generalize results. First, counselor data in our study are not representative of the U.S. counselor workforce due to the sampling constraints of the national private treatment center study. Counselors' respective programs had to meet inclusion criteria such as private-sector operation and community-based settings that excluded correctional facilities and methadone-only programs. Thus, our findings may not apply to counselors working in other types of substance abuse treatment settings (e.g., public treatment programs). Future research in this area should include diverse treatment settings in order to gain a greater understanding of the diffusion of TCMs in varied settings.

Second, we utilized a repeated cross-sectional design rather than longitudinal design to examine diffusion of TCMs in 2002/04 and 2007/08. This design only allowed us to examine differences in diffusion of bupropion and NRT rather than changes in diffusion among substance abuse counselors over time. It will be interesting to replicate this study with a longitudinal sample of counselors to see if similar or different variables are associated with the diffusion of TCMs. The methodology used in the two waves of data that were the basis for these analyses did not allow for counselor identification; while turnover is high among counselors, it is likely that an unknown number of counselors responded in each wave, possibly adding unknown inflation to the results, but nonetheless representing the "reality" of counselor knowledge and attitudes within partially independent panels of treatment centers at two points in time.

Third, we had some measurement concerns. Training, for example, was assessed with a generic question about the extent of training that counselors received in either bupropion or NRT use based on a Likert-type scale. However, we did not ask about the quantity and quality of training such as the number of hours spent in training and the content of each training session. Thus, we are not able to provide detailed recommendations on the ideal training for promoting diffusion of TCMs.

Despite some of these limitations, our study added to the sparse body of literature on the diffusion of TCMs among two samples of substance abuse treatment counselors. Lack of familiarity with TCMs was greater in the second compared to the first sample. However,

counselors who were familiar with bupropion and NRT rated their effectiveness higher in 2007/08 than in 2002/04. In addition, training in the use of TCMs and counselors' level of education were the two main predictors. These findings suggest that an educated and well-trained workforce is essential in diffusing TCMs and raising awareness of the availability and effectiveness of medication assisted therapy. Although counselors cannot prescribe medications, they play an essential role in recommending TCMs to patients, screening patients for their medication needs, referring patients to physicians to prescribe medications, educating patients about available and effective medications, and monitoring patients' compliance with and reactions to medications.

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Table 1
Counselor Characteristics: 2002/04 (N = 992) and 2007/08 (N = 1,226)

| | 2002/04 | 2007/08 | χ^2 or t-test |
|--|---------|---------|--------------------|
| Sex (f, %) | | | 113.04*** |
| Males | 411 | 779 | 65.08 |
| Females | 562 | 418 | 34.92 |
| Race/Ethnicity (f, %) | | | 2.08 |
| Racial/Ethnic Minority | 182 | 255 | 20.80 |
| Non-Hispanic White | 810 | 971 | 79.20 |
| Certified Substance Abuse Counselor (f, %) | | | .00 |
| No | 386 | 481 | 39.49 |
| Yes | 589 | 737 | 60.51 |
| In Recovery (f, %) | | | 8.79** |
| No | 461 | 656 | 53.59 |
| Yes | 515 | 568 | 46.41 |
| Education Level (f, %) | | | 9.81** |
| High School | 170 | 164 | 13.48 |
| College | 340 | 396 | 32.54 |
| Master's Degree and Higher | 471 | 657 | 54.00 |
| Age (M, SD) | 46.29 | 46.45 | 11.98 |
| Experience/yr (M, SD) | 10.53 | 11.39 | 8.89 |
| Extent of Bupropion Training (M, SD) | 2.59 | 2.73 | 2.10 |
| Extent of NRT Training (M, SD) | 2.83 | 3.03 | 2.08 |

* $p < .05$;

** $p < .01$;

*** $p < .001$;

Table 2
Counselor's Knowledge of and Lack of Familiarity with Bupropion and NRT

| | 2002/04 | 2007/08 | <i>t</i> -test/ χ^2 |
|--|-------------|-------------|--------------------------|
| Knowledge of Effectiveness ¹ | | | |
| Bupropion (<i>M, SD, n</i>) | 4.12 (594) | 4.51 (666) | -4.70*** |
| NRT (<i>M, SD, n</i>) | 3.92 (826) | 4.28 (987) | -5.41*** |
| Lack of Familiarity to Rate Effectiveness ² | | | |
| Bupropion (% , <i>n</i>) | 38.25 (368) | 43.75 (518) | 6.61* |
| NRT (% , <i>n</i>) | 16.73 (166) | 19.49 (239) | 2.80 |

Note.

¹ Responses ranged from 1 = *not at all effective* to 7 = *very effective*;

² Percentage of counselors who responded "Don't Know" to the effectiveness question (lower percentages indicate higher diffusion).

* $p < .05$;

*** $p < .001$.

Table 3
Multiple Regression Models: Predictors of Counselors' Knowledge of Bupropion and NRT Effectiveness in 2002/04 and 2007/08

| Variables | Bupropion Effectiveness | | NRT Effectiveness | |
|---------------------------------------|-------------------------|----------------|-------------------|----------------|
| | 2002/04 | 2007/08 | 2002/04 | 2007/08 |
| | β (SE B) | β (SE B) | β (SE B) | β (SE B) |
| Counselor Characteristics | | | | |
| Female | .02 (.13) | -.02 (.12) | .04 (.10) | -.04 (.10) |
| Non-Hispanic White | -.03 (.18) | -.05 (.15) | -.00 (.13) | -.10 (.12)** |
| Certified Counselor | -.01 (.14) | -.07 (.13) | -.11 (.11)** | -.03 (.10) |
| In Recovery | -.05 (.14) | -.02 (.14) | .06 (.12) | -.03 (.10) |
| Age | .02 (.01) | -.00 (.01) | .03 (.01) | .12 (.00)** |
| College ^b | .04 (.18) | -.01 (.19) | .10 (.15) | .00 (.15) |
| Masters' and Higher ^b | .22 (.18)*** | .07 (.19) | .20 (.15)*** | .01 (.15) |
| Experience/years | -.05 (.01)*** | -.07 (.00) | -.02 (.01) | -.07 (.01) |
| Bupropion Training | .15 (.03)*** | .18 (.03)*** | N/A | N/A |
| NRT Training | N/A | N/A | .24 (.02)*** | .19 (.02)*** |
| Organization Characteristics | | | | |
| For Profit | -.01 (.14) | -.04 (.13) | .04 (.11) | -.00 (.10) |
| Hospital-based | .02 (.13) | -.00 (.14) | .02 (.11) | .02 (.12) |
| 12-step orientation | .02 (.14) | -.05 (.13) | .03 (.12) | .06 (.11) |
| Teach tobacco cessation | -.03 (.12) | .16 (.12)*** | -.01 (.10) | .05 (.10) |
| % patients use bupropion ^a | .10 (.03) | -.06 (.04) | N/A | N/A |
| % patients use NRT ^a | N/A | N/A | .05 (.03) | .03 (.02) |
| <i>F</i> (<i>n</i>) | 4.02*** (550) | 4.55*** (634) | 5.59*** (754) | 4.66*** (945) |
| <i>R</i> ² | .10 | .09 | .10 | .07 |

Note,

^a square root transformed;

^b High School is reference group;

** $p < .01$;

*** $p < .001$.

Table 4
Logistic Regression Models: Predictors of Lack of Familiarity with Bupropion and NRT
in 2002/04 and 2007/08

| Variables | Lack of Bupropion Familiarity | | Lack of NRT Familiarity | |
|---------------------------------------|-------------------------------|------------------------|-------------------------|------------------------|
| | 2002/04 | 2007/08 | 2002/04 | 2007/08 |
| | <i>B</i> (<i>SE</i>) | <i>B</i> (<i>SE</i>) | <i>B</i> (<i>SE</i>) | <i>B</i> (<i>SE</i>) |
| Counselor Characteristics | | | | |
| Female | .05 (.16) | -.21 (.16) | .37 (.20) | -.16 (.19) |
| Non-Hispanic White | -.53 (.21) | -.00 (.19) | -.34 (.24) | -.30 (.21) |
| Certified Counselor | -.35 (.18) | -.15 (.17) | -.25 (.21) | .03 (.18) |
| In Recovery | -.51 (.18) ** | -.07 (.17) | -.46 (.22) | -.27 (.19) |
| Age | .01 (.01) | -.01 (.01) | .01 (.01) | -.01 (.01) |
| College ^b | .04 (.24) | .07 (.25) | .24 (.31) | -.03 (.29) |
| Masters' and Higher ^b | -.28 (.25) | .00 (.25) | .02 (.31) | -.14 (.29) |
| Experience/years | -.01 (.01) | .01 (.01) | -.00 (.02) | .01 (.01) |
| Bupropion Training | -.55 (.05) *** | -.76 (.05) *** | N/A | N/A |
| NRT Training | N/A | N/A | -.44 (.07) *** | -.76 (.08) *** |
| Organization Characteristics | | | | |
| For Profit | -.06 (.18) | .09 (.16) | -.34 (.23) | -.11 (.18) |
| Hospital-based | -.01 (.17) | -.30 (.18) | .05 (.21) | -.24 (.22) |
| 12-step orientation | -.08 (.18) | .24 (.17) | .09 (.21) | -.01 (.19) |
| Teach tobacco cessation | .31 (.16) | .22 (.15) | .00 (.20) | -.05 (.17) |
| % patients use bupropion ^a | -.05 (.04) | .01 (.05) | N/A | N/A |
| % patients use NRT ^a | N/A | N/A | .00 (.06) | -.06 (.04) |
| <i>N</i> | 877 | 1133 | 904 | 1 170 |
| Wald χ^2 | 130.63 *** | 247.25 *** | 63.38 *** | 120.52 *** |

Note.

^a square root transformed;

^b High School is reference group;

** $p < .01$;

*** $p < .001$.