Counselor Attitudes Toward Pharmacotherapies for Alcohol Dependence*

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ABSTRACT. Objective: Addiction treatment counselors play a central role in the dissemination of information about new treatment techniques to alcohol-dependent patients and are key in the implementation of new treatment technologies. Building on previous research, this study examines counselors' perceptions of the effectiveness and acceptability of pharmacotherapies for the treatment of alcohol dependence. **Method:** Mail questionnaires were received from 1,140 counselors employed in a nationally representative sample of public-sector addiction treatment programs in 2006. Counselors answered a series of questions about three U.S. Food and Drug Administration (FDA)-approved medications used in the treatment of alcohol dependence (disulfiram [Antabuse], tablet naltrexone [Revia], and acamprosate [Campral]), indicating their extent of familiarity with the medication, its perceived effectiveness in the treatment of alcohol dependence, and its acceptability for use

with alcohol-dependent patients. **Results:** The extent of diffusion of these pharmacotherapies was associated with time since FDA approval. Counselors reported receiving little or no pharmacotherapy-specific training. Multivariate models showed that the receipt of medication-specific training as well as indirect observation of the medication's use in the treatment program were significantly associated with diffusion of information about these pharmacotherapies and counselors' perceptions of the effectiveness and acceptability of the medications for use in addiction treatment. **Conclusions:** When exposed to information about medications to treat alcohol dependence, counseling staff appear quite receptive. More efforts are needed to disseminate information about alcohol pharmacotherapies to front-line addiction treatment staff. (*J. Stud. Alcohol Drugs* 70: 628-635, 2009)

ADVANCES CONTINUE TO BE MADE in the development of pharmacotherapies for the treatment of alcohol dependence and the prevention of relapse to drinking. However, recent studies have shown a slow uptake of new medications by specialty treatment programs (e.g., Fuller et al., 2005; Knudsen et al., 2005, 2007) and a decline in the use of more established medications (Ducharme et al., 2006; Oser and Roman, 2007). This research has begun to identify barriers to the adoption and implementation of pharmacotherapies in routine clinical practice. These include structural factors such as program licensing requirements, personnel factors including access to physicians, and financing factors, particularly insurance coverage for medications. However, a substantial barrier to the diffusion of alcohol pharmacotherapies may be ideological. Receptivity to the implementation of medications may be directly related to the 12-step orientation dominating the treatment field and the recovering status

of many clinicians who staff the nation's 12,000 community treatment programs.

A majority of addiction treatment services in the United States are delivered in group and one-on-one therapy sessions by addiction counselors rather than by addictionologists or primary care physicians. In addition to delivering psychosocial therapies, counselors recommend services to patients, offer guidance and advice, and help them navigate the treatment system. As such, counselors represent the primary conduit through which patients are introduced to or become aware of the full range of available treatment options. Further, once a treatment option is introduced, the counselor's apparent support for it can be key to the patient's engagement. Conversely, counselors may undermine a patient's response to treatment by actively or unwittingly endorsing or discounting a particular therapeutic approach. Thus, although counselors do not directly prescribe or dispense pharmacotherapies, they can play a vital role in introducing patients to medication-assisted therapies, encouraging and monitoring compliance, identifying potential problems, and facilitating linkages with medical personnel.

Relatively little research attention has been paid to front-line counselors' orientations toward pharmacotherapies, although there are studies to suggest that they generally lack information about the availability, effectiveness, and use of these medications (Forman et al., 2001; Thomas et al., 2003; Thomas and Miller, 2007). In addition, studies indicate that clinical researchers and pharmaceutical companies rarely

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target counselors as recipients of relevant pharmacotherapy information (Thomas and Miller, 2007; Thomas et al., 2008). Given front-line counselors' important roles in influencing the overall treatment process, it becomes crucial to examine the extent to which information about new medications is disseminated to them. Further, we need to know whether and how the receipt of this information influences counselors' receptivity to the integration of pharmacotherapies in the treatment of alcohol dependence.

Drawing on surveys conducted with 1,140 counselors working in specialty alcohol and drug treatment programs in 2006, this article examines the extent to which counselors were familiar with and receptive to the three then available medications for the treatment of alcohol dependence: disulfiram (Antabuse), tablet naltrexone (Revia), and acamprosate (Campral).

Prior research on clinician attitudes toward alcohol pharmacotherapies

Within the limited research on clinician attitudes toward alcohol pharmacotherapies, most attention has been paid to tablet naltrexone, which has had U.S. Food and Drug Administration (FDA) approval for the treatment of alcohol dependence since 1994. In contrast, clinician attitudes toward both the oldest (disulfiram) and newest (acamprosate) medications are not well documented.

In a pair of studies, Mark et al. (2003a,b) examined tablet naltrexone prescribing patterns using a sample of 1,388 American Society of Addiction Medicine and Association of Persons Affected by Addiction member physicians. Multivariate models revealed that patient insurance coverage, physicians' perceptions of effectiveness, and exposure to information about tablet naltrexone were associated with prescribing behavior. The most significant barriers to prescribing were physicians' concerns about patients' compliance and the cost of the medication.

Thomas et al. (2003) surveyed both physician and non-physician clinicians, including counselors, about the adoption of tablet naltrexone in three states with unique policy climates. They found non-physicians were less familiar with naltrexone overall and that the attitudes of both groups of clinicians toward its use were shaped by the prevailing philosophy of the organization in which they worked. Counselors who did not recommend naltrexone most often cited lack of information about the medication, conflict with treatment philosophy, and concerns about its cost to patients as barriers to adoption.

Most recently, Thomas and Miller (2007) surveyed administrators and counselors from six community-based treatment centers in South Carolina regarding their knowledge of tablet naltrexone and their valuation of adjunctive alcohol pharmacotherapies. The results of this exploratory study revealed that respondents had little knowledge of naltrexone and that

clinicians lacked confidence in the value of pharmacotherapies for alcohol dependence treatment. Multivariate models identified clinicians' years of experience in the field as the only significant predictor of their valuation of adjunctive pharmacotherapies for alcoholism. This study suggests that lack of information about naltrexone was a crucial barrier to greater use of pharmacotherapies in alcohol treatment.

Counselors' familiarity with a given medication is an indicator of the extent to which that medication has diffused to the field. As described in Rogers' (1995) classic text, *Diffusion of Innovations*, "diffusion" is the process of spreading information about an innovation. (In this context, an "innovation" is a practice that is new to a clinician or organization, although, like disulfiram, it may not be a "new" technology in any absolute sense.) In the case of pharmacotherapies, this communication process necessarily precedes the adoption (i.e., use) of medications in addiction treatment settings. Although "don't know" responses are often treated as missing data in survey research, in this specific instance such data may be used to gauge the diffusion process. This analytic approach has been effectively used in studying the diffusion of naltrexone among clinicians (Thomas and Miller, 2007), as well as the diffusion of buprenorphine for the treatment of opioid dependence (Knudsen et al., 2005). We replicate that approach in this article to examine and compare the diffusion of pharmacotherapies for alcoholism treatment.

Because diffusion is a process rather than a discrete event, it is likely that counselors' awareness of different pharmacotherapies may vary with the length of time that has elapsed since a medication's FDA approval. Thus, one should expect counselors to express greater familiarity with disulfiram than with acamprosate, because the former has been available to the field for a significantly longer period. Less clear is whether time is equally predictive of counselors' receptivity to these medications or what other factors are at play in shaping their opinions.

In addition to examining familiarity and receptivity to these medications, it is also important to identify factors that are predictive of counselors' attitudes toward using these pharmacological approaches. Counselors' personal predispositions toward pharmacotherapies may be shaped by such factors as their level of education, their own recovery status, and their general attitudes toward the role of medications in the recovery process. At the same time, these predispositions may be shaped by their on-the-job exposure to patients receiving medications for alcohol dependence, by the receipt of specific training on the use of pharmacotherapies, or by the culture of the organization in which they work. Although such factors have received limited attention in prior research (e.g., Knudsen et al., 2005; Meza et al., 2001; Thomas et al., 2003), it remains to be seen whether one or more common factors similarly influence attitudes across different medications or whether the formation of attitudes is medication specific.

In sum, this study investigates the attitudes of addiction treatment counselors toward three FDA-approved pharmacotherapies for alcohol dependence. Separate models examine the diffusion, relative acceptability, and perceived effectiveness of each medication. Multivariate models highlight personal and experiential factors that are common influences on counselors' attitudes.

Method

The data for this study were collected in 2005-2006 from counselors working in a nationally representative sample of 318 publicly funded addiction treatment programs. Eligible sample units offered at least one level of care between American Society of Addiction Medicine-defined Level 1 (outpatient) to Level 3 (inpatient) services and received at least 51% of their annual operating revenues from federal, state, or local funds, including block grants. Because the study focused on programs that were available to the general public, correctional and Veteran's Health Administration facilities were excluded. Finally, to focus on counseling-intensive treatment modalities, programs exclusively offering detoxification or methadone (Dolophine and Methadose) maintenance services were not included in the sampling frame.

A two-stage sampling process was used. First, all U.S. counties were assigned to one of 10 strata based on population and were then randomly sampled within strata. This process ensured that a mixture of urban, suburban, and rural areas would be included in the study. In the second stage, all substance abuse treatment facilities in the sampled counties were enumerated using published national and state directories. Treatment facilities 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 alternate units in the same geographic stratum until the target sample size was reached. The 318 responding facilities represent 80% of the eligible sampled units.

A trained interviewer from the University of Georgia conducted face-to-face interviews with the administrator and clinical director of each participating treatment program. At the conclusion of the interview, the clinical director was asked to provide a list of all addiction counselors employed in the program. Each counselor was subsequently mailed a packet at their work address that included an invitation letter, study questionnaire, consent form, and postage-paid return envelope. A \$40 incentive was paid to counselors who returned a completed questionnaire. In all, 1,140 questionnaires were completed and returned, representing a 61% response rate. Respondents did not differ significantly from the population of counselors employed by these programs when compared with aggregate data from the program administrator on staff composition (gender, race, education,

certification). The research design was approved by the Human Subjects Committee of the University of Georgia's Institutional Review Board.

Measures

Dependent variables. Two dependent variables were constructed from an item in which counselors were asked to rate the effectiveness of alcohol pharmacotherapies for use in addiction treatment: "Based on your knowledge and personal experience, to what extent do you consider each of the following treatment techniques to be effective?" Disulfiram, tablet naltrexone, and acamprosate were listed (along with their corresponding brand names) among 11 different FDA-approved pharmacotherapies for addiction, smoking cessation, and psychiatric conditions. Response categories ranged from 1 (not at all effective) to 7 (very effective). Counselors were also given the option of responding "don't know" if they felt they could not evaluate a medication's effectiveness. The diffusion of each medication was measured as the proportion of counselors who provided a "don't know" response. For each medication, diffusion is a binary variable that was coded 1 if counselors answered "don't know" to the effectiveness item, and 0 otherwise. Higher percentages of "don't know" responses indicate less complete diffusion of the medication to the field.

Perceived effectiveness is measured using the 1-7 scale for each of the three medications. Counselors who selected the "don't know" option were excluded from the effectiveness analyses; as a result, the valid number of respondents varies for each medication.

A separate item was used to measure the acceptability of disulfiram, tablet naltrexone, and acamprosate for the treatment of alcohol dependence. Counselors were asked, "To you as a treatment professional, how acceptable is the use of each of the following as treatment techniques for substance abuse?" Again, the three alcohol pharmacotherapies were embedded in a list of other addiction and psychiatric medications. Responses ranged from 1 (completely unacceptable) to 7 (very acceptable). A "don't know" option was also provided. Counselors responding "don't know" were excluded from the regression analyses examining perceived acceptability.

Independent variables. Independent variables fell into four general categories: counselor characteristics, caseload characteristics, pharmacotherapy exposure, and general attitudes about medications.

Counselor characteristics included gender (female = 1), race (nonwhite = 1), and age. Counselors' education and experience may influence their perceptions of medications, and these domains were measured by level of education (master's degree or higher = 1, bachelor's degree or below = 0); tenure, indicated by the number of years the counselor has worked in the addiction treatment field; recovery status, indicating

counselors who reported being in recovery from their own addiction; and 12-step orientation. The latter is measured using a 3-item mean scale adapted from Kasarabada et al. (2001), with scores ranging from 1 to 7, where higher scores indicated a stronger endorsement of elements of a 12-step treatment philosophy. Prior analyses have found a significant negative association between 12-step philosophy and perceived acceptability of buprenorphine (Buprenex, Suboxone, Subutex) for opioid dependence treatment (Knudsen et al., 2005).

In terms of caseload characteristics, each counselor reported their current caseload size (i.e., the number of patients to whom they were assigned as primary counselor), as well as the percentage of their patients with alcohol-dependence diagnoses. Hours worked per week was also included to control for potential differences between full- and part-time counselors.

Exposure to these alcohol pharmacotherapies was measured using two variables. Counselors were asked to what extent their treatment program had provided them with specific training about disulfiram, tablet naltrexone, and acamprosate. Responses were coded on a 7-point scale, with higher scores indicating receipt of more pharmacotherapy-specific training. Because counselors may also acquire indirect knowledge of a medication by working in a program where it is prescribed to at least some patients, we included data about the use of the pharmacotherapy in the program. Medication adoption was measured by three dichotomous variables that denoted whether counselors were employed in a treatment program that currently prescribed each of the three medications (1 = employed in a program currently using the medication, 0 = not employed in a program currently using the medication).

Finally, in the models of pharmacotherapy effectiveness and acceptability we also included a measure of counselors' general attitudes toward the use of medications in addiction treatment. Such a variable helps to account for the possibility that a counselor's specific perceptions of these alcohol pharmacotherapies were colored by a more negative stance concerning the use of *any* medications in the treatment of

alcohol and drug dependence. In a separate section of the questionnaire, counselors were asked to what extent they agreed or disagreed with a series of statements about addiction treatment, including the following item: "Medications can improve outcomes in addiction treatment programs." Responses were coded on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Analytic strategy

A series of logistic regression models were estimated to predict the likelihood that counselors provided a "don't know" response when asked to assess the effectiveness of each of the three medications. Next, a series of multivariate regression models examined the predictors of each medication's perceived effectiveness and acceptability. All variables used in these analyses are person-level data obtained from counselor questionnaires. Models were estimated using the Stata 10.0 software package (StataCorp LP, College Station, TX). We report McKelvey and Zavonia's pseudo- R^2 measure of logistic regression model fit (Long and Freese, 2006). Diagnostic tests showed no evidence of multicollinearity among independent variables.

Results

A total of 1,140 counselors responded to the surveys. In all, 65.4% of respondents were female, 36.8% were nonwhite, and the average (SD) age was 45.5 (11.5) years. A total of 42% had earned at least a master's degree. Counselors had been working in the treatment field an average of 9.3 (7.3) years, and 45.2% reported being in recovery. The sample mean for the 12-step orientation scale was just above the midpoint (4.4 [1.6]). In terms of workload, counselors reported working an average of 39.3 (9.7) hours per week and treating a mean caseload of 20.6 (14.8) patients. Counselors reported that on average, 53.3% (32.6%) of their caseload met criteria for alcohol dependence.

Table 1 provides information about the diffusion of alcohol pharmacotherapies in the public addiction treatment

TABLE 1. Distribution of pharmacotherapy diffusion, perception, and exposure variables, % or mean (SD)

Variable	Disulfiram	Tablet naltrexone	Acamprosate
Dependent variables			
Diffusion ^a	28.2%	58.1%	76.1%
Perceived effectiveness ^b	3.78 (2.71)	4.11 (1.50)	4.10 (1.75)
Perceived acceptability ^b	4.59 (1.93)	4.64 (1.76)	4.47 (1.96)
Pharmacotherapy exposure variables			
Extent of counselor training ^b	2.15 (1.68)	1.83 (1.50)	1.61 (1.31)
Pharmacotherapy use in program ^c	19.8%	13.6%	10.3%

^aPercentage of counselors who responded "don't know" to the effectiveness item; ^bitem measured on a 1-7 scale; sample mean (SD) reported; ^cpercentage of counselors employed in a program that currently used each medication.

TABLE 2. Logistic regression results for the diffusion of disulfiram, tablet naltrexone, and acamprosate ($n = 1,140$)

Predictor	Disulfiram		Tablet naltrexone		Acamprosate	
	<i>b</i> (SE)	OR (95% CI)	<i>b</i> (SE)	OR (95% CI)	<i>b</i> (SE)	OR (95% CI)
Female	0.36 (0.17)*	1.44 (1.03-2.01)	0.42 (0.15) [†]	1.53 (1.15-2.03)	0.35 (0.17)*	1.42 (1.02-1.99)
Nonwhite	0.26 (0.16)	1.29 (0.95-1.76)	-0.01 (0.14)	0.99 (0.75-1.31)	-0.39 (0.17)*	0.68 (0.49-0.95)
Age	-0.02 (0.01)*	0.98 (0.97-1.00)	0.00 (0.01)	1.00 (0.99-1.02)	0.01 (0.01)	1.01 (0.99-1.03)
Level of education	-0.15 (0.17)	0.86 (0.62-1.19)	0.00 (0.15)	1.00 (0.75-1.34)	-0.13 (0.18)	0.88 (0.62-1.26)
Tenure	-0.07 (0.01) [†]	0.93 (0.91-0.96)	-0.04 (0.01) [†]	0.96 (0.94-0.98)	-0.03 (0.01)*	0.97 (0.95-1.00)
Recovery status	-0.74 (0.18) [†]	0.48 (0.34-0.68)	-0.60 (0.16) [†]	0.55 (0.41-0.75)	-0.46 (0.19)*	0.63 (0.44-0.91)
12-step orientation	0.00 (0.05)	1.00 (0.91-1.10)	-0.01 (0.05)	0.99 (0.90-1.08)	-0.16 (0.06) [†]	0.86 (0.77-0.95)
Caseload size	-0.01 (0.01)	0.99 (0.98-1.00)	-0.01 (0.01)	0.99 (0.98-1.00)	-0.00 (0.01)	1.00 (0.99-1.01)
% alcohol clients	-0.00 (0.00)	1.00 (0.99-1.00)	-0.00 (0.00)	1.00 (1.00-1.00)	0.01 (0.00)*	1.01 (1.00-1.01)
Hours per week	-0.01 (0.01)	0.99 (0.98-1.01)	-0.01 (0.01)	0.99 (0.98-1.01)	0.00 (0.01)	1.00 (0.99-1.02)
Specific training	-0.33 (0.06) [†]	0.72 (0.64-0.82)	-0.35 (0.05) [†]	0.71 (0.64-0.78)	-0.47 (0.06) [†]	0.62 (0.55-0.70)
Medication adoption	-1.53 (0.30) [†]	0.22 (0.12-0.39)	-1.62 (0.23) [†]	0.20 (0.13-0.31)	-1.87 (0.26) [†]	0.15 (0.09-0.26)
McKelvey and Zavanon's R^2		.366		.268		.280

Notes: OR = odds ratio; CI = confidence interval.

* $p < .05$; [†] $p < .01$ (two-tail significance test).

system. In all, 28.2% of counselors reported that they did not know the effectiveness of disulfiram, 58.1% did not know the effectiveness of tablet naltrexone, and 76.1% did not know the effectiveness of acamprosate. The trend is consistent with the length of time elapsed since each medication's FDA approval. These data highlight the low rate of diffusion of these medications among counselors in community-based treatment programs.

The effectiveness and acceptability data, also summarized in Table 1, revealed that counselors rated disulfiram as less effective than tablet naltrexone ($t = -5.21$, $p < .001$) or acamprosate ($t = -3.12$, $p < .001$), which is consistent with clinical research findings. In terms of perceived acceptability, acamprosate received the lowest ratings, but these differences were not statistically significant. Still, these findings suggest counselors form their opinions of effectiveness and acceptability using information other than scientific research findings, highlighting a disconnect between research and everyday treatment practice.

Turning to the pharmacotherapy exposure variables, the extent of medication-specific training was well below the scale midpoint of 4.0 for each medication. Counselors were also relatively unlikely to have been indirectly exposed to these medications in their treatment programs. The pattern of program-level exposure to these medications mimics the distribution of "don't know" responses, suggesting the latter is a valid means of measuring diffusion among clinicians.

Modeling the diffusion of alcohol pharmacotherapies

Logistic regression models predicting the log odds of a "don't know" response to the effectiveness of each of the three medications are presented in Table 2. Similar patterns were found in all three models. First, several counselor characteristics were predictive of diffusion. Female counselors

were significantly more likely to provide a "don't know" response about the effectiveness of each medication, as were counselors in recovery. Likewise, shorter tenure in the treatment field was associated with greater odds of "don't know" responses. A standard deviation increase in tenure decreased the odds of a "don't know" response by 40.1% in the disulfiram model, 27.4% in the tablet naltrexone model, and 19.1% in the acamprosate model. In addition, in the acamprosate model, nonwhite counselors were less likely to provide a "don't know" response relative to white counselors. A 12-step orientation was also significantly associated with diffusion in the acamprosate model; a standard deviation increase in 12-step orientation was associated with a 23.7% increase in the odds of a "don't know" response. Caseload characteristics had no significant effect on counselor knowledge of either disulfiram or tablet naltrexone. However, the proportion of alcohol-dependent patients in a counselor's caseload was a significant predictor of awareness of acamprosate, yet in an unexpected direction. Counselors with proportionately more alcohol-dependent patients were significantly more likely to express a lack of familiarity with acamprosate. Specifically, a standard deviation increase in the percentage of alcohol-dependent patients was associated with a 23.7% increase in the odds of a "don't know" response.

The pharmacotherapy exposure variables were significantly associated with the diffusion of information about all three medications. Counselors who had received medication-specific training were significantly less likely to provide a "don't know" response when asked about the effectiveness of disulfiram, tablet naltrexone, and acamprosate. In each model, a standard deviation unit increase in training decreased the odds of a "don't know" response by approximately 40%. Likewise, use of the medication in the counselor's treatment program significantly decreased the likelihood of providing a "don't know" response to the effectiveness items.

TABLE 3. Ordinary least squares regression results for perceived counselor effectiveness of disulfiram, tablet naltrexone, and acamprosate

Predictor	Disulfiram <i>b</i> (SE)	Tablet naltrexone <i>b</i> (SE)	Acamprosate <i>b</i> (SE)
Female	0.27 (0.12)*	0.17 (0.14)	0.23 (0.21)
Nonwhite	0.47 (0.12)†	0.10 (0.15)	-0.24 (0.22)
Age	-0.00 (0.01)	0.01 (0.01)	-0.01 (0.01)
Level of education	-0.03 (0.13)	0.16 (0.16)	0.13 (0.22)
Tenure	0.01 (0.01)	0.01 (0.01)	0.03 (0.02)
Recovering	-0.14 (0.13)	-0.07 (0.16)	-0.02 (0.22)
12-step orientation	-0.01 (0.04)	-0.06 (0.05)	-0.14 (0.07)*
Caseload size	0.01 (0.00)†	0.01 (0.00)	0.00 (0.01)
% alcohol patients	-0.01 (0.00)*	-0.00 (0.00)	-0.00 (0.00)
Hours per week	-0.02 (0.01)*	-0.00 (0.01)	0.02 (0.01)*
Specific training	0.14 (0.04)†	0.17 (0.04)†	0.30 (0.07)†
Medication adoption	0.52 (0.14)†	0.14 (0.16)	0.27 (0.27)
Medication attitudes	0.12 (0.04)†	0.20 (0.04)†	0.15 (0.06)*
<i>R</i> ²	.140	.134	.267
<i>N</i>	806	457	256

*p < .05; †*p* < .01 (two-tail significance test).

Modeling the perceived effectiveness of alcohol pharmacotherapies

Table 3 presents regression coefficients for counselors' perceptions of the effectiveness of these medications. Counselor and caseload characteristics did not consistently predict perceived effectiveness across the three medications. Female and nonwhite counselors provided significantly more favorable ratings of disulfiram than their counterparts, but this difference did not hold for tablet naltrexone or acamprosate. Endorsement of a 12-step orientation was significantly (and inversely) associated only with acamprosate. Counselors with larger caseloads rated disulfiram, but not the other medications, as significantly more effective than did counselors with smaller caseloads. Counselors treating more alcohol-dependent patients viewed disulfiram as less effective, but their caseload composition had no effect on their assessment of tablet naltrexone or acamprosate. Finally, weekly work hours was positively associated with perceived effectiveness of disulfiram, negatively associated with acamprosate, and not significantly associated with naltrexone.

Counselors' exposure to these medications was associated with perceptions of effectiveness. Receipt of medication-specific training was strongly predictive of perceived effectiveness; counselors who received more medication-specific training had significantly more favorable attitudes about the effectiveness of disulfiram, naltrexone, and acamprosate in the treatment of alcohol dependence. Exposure to the use of the medication in the counselors' employing treatment program had inconsistent effects on attitudes, as it predicted the perceived effectiveness of only disulfiram.

Counselors' general attitudes toward the role of medications in addiction treatment were strongly predictive of perceived effectiveness. For all three medications, counselors who indicated more favorable attitudes toward medica-

TABLE 4. Ordinary least squares regression results for perceived counselor acceptability of disulfiram, tablet naltrexone, and acamprosate

Predictor	Disulfiram <i>b</i> (SE)	Tablet naltrexone <i>b</i> (SE)	Acamprosate <i>b</i> (SE)
Female	0.39 (0.13)†	0.14 (0.15)	0.21 (0.22)
Nonwhite	0.21 (0.13)	-0.17 (0.15)	-0.42 (0.24)
Age	-0.10 (0.14)	-0.01 (0.01)	-0.01 (0.02)
Level of education	0.01 (0.01)	0.22 (0.16)	0.34 (0.24)
Tenure	-0.00 (0.01)	0.01 (0.01)	0.02 (0.02)
Recovering	-0.08 (0.04)*	-0.19 (0.16)	-0.14 (0.24)
12-step orientation	-0.01 (0.00)*	-0.07 (0.05)	-0.12 (0.07)
Caseload size	0.01 (0.00)	-0.00 (0.01)	-0.01 (0.01)*
% alcohol patients	-0.01 (0.01)	-0.00 (0.00)	0.00 (0.00)
Hours per week	-0.28 (0.14)	-0.01 (0.01)	0.02 (0.01)
Specific training	0.16 (0.04)†	0.19 (0.04)†	0.17 (0.07)*
Medication adoption	0.86 (0.16)†	0.38 (0.17)*	0.57 (0.28)*
Medication attitudes	0.20 (0.04)†	0.39 (0.05)†	0.26 (0.07)†
<i>R</i> ²	.163	.239	.275
<i>N</i>	894	509	273

*p < .05; †*p* < .01 (two-tail significance test).

tions in general viewed alcohol pharmacotherapies as significantly more effective than counselors with less favorable predispositions.

Predicting the perceived acceptability of alcohol pharmacotherapies

Table 4 presents the results of similar models measuring the perceived acceptability of the three alcohol pharmacotherapies. As above, counselor and caseload characteristics were somewhat more predictive of attitudes toward disulfiram than naltrexone or acamprosate. Female counselors were significantly more accepting of disulfiram than their male counterparts, whereas counselors in recovery and those endorsing a 12-step orientation viewed disulfiram as less acceptable. Caseload size predicted only acamprosate's perceived acceptability and in an unexpected negative direction. Attitudes toward tablet naltrexone were not predicted by counselor or caseload variables. In contrast, both of the medication exposure variables were significantly associated with perceived acceptability of all three medications, as was the general measure of attitudes toward medications. Counselors who received training about these medications, who work in treatment facilities where they are used, and who hold more favorable attitudes toward medications in general were more likely to endorse them as acceptable for the treatment of alcohol dependence.

Discussion

This survey of 1,140 front-line counselors in a representative sample of public-sector specialty addiction treatment facilities suggests that the diffusion of alcohol pharmacotherapies was far from complete as of 2006. A sizable minority of counselors were unfamiliar with disulfiram,

despite its availability to the field for more than 50 years. Far more respondents were unfamiliar with tablet naltrexone, with more than half of the sample indicating that they did not have enough information to rate the drug's effectiveness. Given these findings, it is not surprising that the majority of the sample were unfamiliar with acamprosate, a medication that received its FDA approval shortly before this survey was implemented.

Data on the perceived effectiveness and acceptability of these medications suggest that training is essential to increase counselors' receptivity to the use of medications for the treatment of alcohol-dependent patients. Along these lines, Thomas et al. (2008) recently reported the results of an educational intervention in which counselors were randomized to receive either written information about naltrexone or written information coupled with didactic presentations, additional reading material, and tools designed to help patients talk to their physicians about naltrexone. Counselors in the intervention group showed significant improvements in their knowledge of naltrexone; all counselors showed an increase in receptive attitudes toward the medication, but the between-group differences were not statistically significant. Nevertheless, the project demonstrated that intensive training can have a measurable impact on counselors' perceptions of naltrexone. An observational study of more than 1,700 addiction treatment counselors likewise found that those who had been directly exposed to training on buprenorphine were significantly more likely to rate it as effective and as acceptable for use by their patients (Knudsen et al., 2005).

Developing training materials to change counselor attitudes toward pharmacotherapies is at the heart of multiple ongoing initiatives at the federal level. For example, National Institute on Drug Abuse-supported blending products include Buprenorphine Treatment: A Training for Multidisciplinary Addiction Professionals (National Institute on Drug Abuse/Substance Abuse and Mental Health Services Administration Blending Team, 2005), a multimedia package designed to promote awareness and knowledge about this pharmacotherapy to the direct care workforce. The Substance Abuse and Mental Health Services Administration's Addiction Technology Transfer Centers (ATTCs) have revised and redeployed a booklet addressing "what every counselor should know" about psychotherapeutic medications (Mid-America ATTC, 2008). The Center for Substance Abuse Treatment has produced Treatment Improvement Protocols (written manuals) on naltrexone (Center for Substance Abuse Treatment, 1998) and medication-assisted treatment for opioid addiction (Center for Substance Abuse Treatment, 2005). However, given Thomas et al.'s (2008) findings about the relative impact of didactic, intensive, and interactive instruction compared with static written training materials, the success of these initiatives needs to be monitored. Although it is relatively efficient to gather data on the adoption of medications at the facility level (as reported in the annual National Survey of Substance

Abuse Treatment Services [Substance Abuse and Mental Health Services Administration, 2007]), the observational studies needed to monitor changes in counselor attitudes are comparatively expensive and logistically complex. Those who deliver training and disseminate educational materials should integrate efforts wherever possible to measure the impact of those resources on counselor knowledge, attitudes, and behavior, all of which have downstream implications for patients' access to high-quality treatment services.

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