A Randomized Controlled Trial of Cognitive-Behavioral Treatment for Depression Versus Relaxation Training for Alcohol-Dependent Individuals With Elevated Depressive Symptoms*

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ABSTRACT. Objective: A previous pilot study found positive outcomes among alcohol-dependent individuals with elevated depressive symptoms who received cognitive-behavioral treatment for depression (CBT-D; $n = 19$) compared with a relaxation training control (RTC; $n = 16$). The current study represents a replication of this pilot study using a larger sample size and a longer follow-up assessment period. **Method:** Patients entering a partial hospital drug and alcohol treatment program who met criteria for alcohol dependence and elevated depressive symptoms (Beck Depression Inventory score ≥ 15) were recruited and randomly assigned to receive eight individual sessions of CBT-D ($n = 81$) or RTC ($n = 84$). **Results:** There were significant improvements in depressive and alcohol use outcomes over time for all participants.

Compared with RTC, the CBT-D condition had significantly lower levels of depressive symptoms, as measured by the Beck Depression Inventory, at the 6-week follow-up. However, this effect was inconsistent because there were no differences in the Modified Hamilton Rating Scale for Depression between conditions at that time point and there were no significant differences at any other follow-up. No significant between-group differences on alcohol use outcomes were found. **Conclusions:** The current findings did not replicate the positive outcomes observed in the CBT-D condition in our previous pilot study. Possible explanations for why these findings were not replicated are discussed, as are theoretical and clinical implications of using CBT-D in alcohol treatment. (*J. Stud. Alcohol Drugs*, 72, 286-296, 2011)

THE CO-OCCURRENCE OF DEPRESSION and alcohol use disorders is well documented (Grant and Harford, 1995; Kandel et al., 2001; Kessler et al., 2005; Regier et al., 1990), with particularly high rates of comorbidity among treatment-seeking individuals with alcohol dependence (Grant, 1997; Lynskey, 1998). In addition to the high rates of actual depressive disorders, the majority of patients entering treatment for an alcohol use disorder report clinically significant levels of depressive symptoms that may, in part, be the result of the physiological effects of alcohol (Dorus et al., 1987; Nakamura et al., 1983; Schuckit et al., 1997). Yet, studies on the association between major depression and

alcoholism treatment outcomes have been decidedly mixed, with some finding improved outcomes among those with comorbid depression and alcohol dependence (Charney et al., 1998), some finding poorer outcomes (Greenfield et al., 1998; Kranzler et al., 1996), many finding no association (Booth et al., 1991; Miller et al., 1997; Sellman and Joyce, 1996), and others finding improved outcomes in depressed females and poorer outcomes in depressed males (Hesselbrock, 1991; Rounsaville et al., 1987). Still, data suggest that compared with those who solely have either depression or alcohol dependence, patients with co-occurring depression and alcohol dependence tend to report more severe symptomatology and poorer outcomes (Greenfield et al., 1998; Kranzler et al., 1996; Rounsaville et al., 1987; Thase et al., 2001).

Given the potentially deleterious effects of depression on alcohol treatment outcomes and the demonstrated efficacy of cognitive-behavioral treatment for depression (CBT-D; Brown and Lewinsohn, 1984b; Jarrett and Rush, 1994; Lewinsohn et al., 1984), two studies have examined the efficacy of CBT-D for reducing alcohol use in patients with comorbid alcohol dependence and depression. One early study reported positive findings using this approach, but more treatment contact was provided with CBT-D ver-

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sus the standard comparison treatment (Monti et al., 1990; Turner and Wehl, 1984). In a subsequent pilot study that corrected this design flaw (Brown et al., 1997), we evaluated the comparative efficacy of adding CBT-D versus a relaxation training control (RTC) to standard partial hospital alcohol treatment in a sample of 35 alcohol-dependent individuals with elevated levels of depressive symptoms. As expected, depressive symptoms for all participants decreased with abstinence. However, findings revealed that CBT-D patients had significantly greater reductions in somatic depressive symptoms and depressed and anxious mood after treatment than RTC patients. Further, preliminary analyses suggested that decreases in somatic depressive symptoms served to mediate the relationship between treatment condition and drinking outcomes. Patients receiving CBT-D had a greater percentage of days abstinent but not greater overall abstinence or fewer drinks per day during the first 3-month follow-up. However, during the second 3 months of the 6-month follow-up period, CBT-D patients had significantly better alcohol use outcomes compared with RTC patients on total abstinence (47% vs. 13%, respectively), percentage of days abstinent (90.5% vs. 68.3%, respectively), and drinks per day (0.46 vs. 5.71, respectively). Although the results of this study were very promising, the sample size was modest, and the follow-up extended to only 6 months. Thus, a larger-scale clinical trial with a longer follow-up was warranted to evaluate the efficacy of CBT-D for alcohol dependence and elevated depressive symptoms.

The present study represents an attempt to replicate the findings from the Brown et al. (1997) study with a larger sample size. In the present study, the two treatment protocols were the same as in the prior study. However, in the prior study, treatment sessions were delivered over 8 consecutive days while participants were engaged in partial hospital treatment for alcohol dependence, whereas in the present study, almost all eight individual treatment sessions were delivered on an outpatient basis over 6 weeks. This was because the average length of stay in the partial hospital program from which participants were recruited decreased considerably (from $M = 21.2$, $SD = 4.5$ to $M = 3.9$, $SD = 2.3$ calendar days) in the intervening time between the two studies.

We hypothesized that the use of CBT-D as an adjunct to partial hospital alcohol treatment would result in decreased levels of depressive symptoms and in reduced quantity and frequency of alcohol use over a 12-month follow-up relative to the use of a relaxation control. Although we anticipated a reduction in depressive symptoms upon a period of continued abstinence regardless of treatment condition, we hypothesized that participants in the CBT-D condition would report greater reductions relative to those in the control condition. Additionally, we expected that the predicted reductions in drinking in the CBT-D group would be mediated by decreases in depressive symptoms.

Method

Participants

Sample size for this study was determined following procedures as outlined for multiple regression by Cohen (1988), with $\alpha = .05$ and power = .80. Data from the pilot investigation (Brown et al., 1997) served as the source for estimates of effect size. Participants were 166 men and women recruited from the intensive day and evening partial hospital program, a component of Alcohol and Drug Treatment Services (ADTS) at Butler Hospital, a private, nonprofit hospital in Providence, Rhode Island, providing treatment of psychiatric and substance use disorders. Patients, ages 18-65 years, were included in the study provided they met Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV; American Psychiatric Association, 1994), criteria for alcohol dependence as determined by the patient version of the Structured Clinical Interview for DSM-IV (SCID-P; First et al., 1995) and had a Beck Depression Inventory (BDI; Beck et al., 1961) total score of 15 or greater. Participants are referred to throughout this paper as patients with alcohol dependence and elevated depressive symptoms to avoid incorrectly suggesting that participants met diagnostic criteria for a depressive disorder. Patient exclusion criteria were current suicidality or homicidality, history of psychotic disorder or current psychotic symptoms, current DSM-IV diagnosis of opioid dependence, current DSM-IV diagnosis of bipolar disorder, and marked organic impairment.

Following admission to the ADTS partial hospital program, patients were informed about the study and consent was obtained. Potential participants were then given a screening interview to determine eligibility. Eligible patients who consented to participate completed the pre-treatment assessment battery and were assigned to receive either individual CBT-D or the individual RTC. Potential participants were recruited in sequential, nonoverlapping cohorts, with a 1-week break in recruitment between cohorts to minimize the possibility of treatment contamination should participants compare treatment manuals and procedures. The number and size of the cohorts were determined in advance, and treatment assignment was randomly selected from the fixed pool of possible assignments. Consecutive admissions were recruited into the study until there were 15 participants in the cohort.

Participants for the study were recruited from November 1997 through March 2000, and follow-ups were conducted from December 1997 through April 2001. The flow of participants through all phases of the study is presented in Figure 1. During the recruitment phase, there were 1,499 admissions to the intensive day and evening programs. Of those, 511 were not alcohol dependent, 203 did not have BDI scores of 15 or greater, and 117 did not meet the age inclusion criterion. Others meeting exclusion criteria were

FIGURE 1. Flow of participants through the study. RTC = relaxation training control; CBT-D = cognitive behavioral treatment for depression.

for opiate dependence ($n = 171$), bipolar disorder ($n = 47$), history of psychotic disorder or current psychotic symptoms ($n = 25$), organic impairment ($n = 5$), or suicidality ($n = 4$). Other reasons for noninclusion in the study were early program discharge ($n = 23$), washout period ($n = 32$), unable to recruit because of research staff unavailability ($n = 16$), participating in another study ($n = 9$), and other reasons ($n = 6$). A total of 153 patients refused to participate in the study before the pre-assessment battery, and 11 patients dropped out of the study during assessment. There were no significant differences between those who refused to participate and actual participants in age ($M = 40.7$ vs. 40.8 years, respectively) or gender (38.6% vs. 33% female, respectively). The most frequently cited reasons for refusal to participate in the study included “no time” (44.4%), “not interested” (21.6%), and “live too far away” (9.2%).

Women comprised 33% ($n = 55$) of the sample, and the mean age of participants was 40.8 years ($SD = 9.1$). Participants reported a mean education of 13.4 years ($SD = 2.7$). The sample was 93.4% White (not of Hispanic origin), 2.4% African American, 1.8% Hispanic/Latino, and 2.4% other ethnicities. Marital status for the sample was 22.9% never married, 34.9% married or living as if married, 32.5% divorced and single, 7.2% separated, and 2.4% widowed. Participants' mean score on the Alcohol Dependence Scale (Skinner and Allen, 1982) was 20.9 ($SD = 7.4$), and their mean number of previous alcohol treatments was 3.3 ($SD = 4.1$). On the Timeline Followback (TLFB) interview (Sobell and Sobell, 1996), participants reported that during the 6 months before treatment they were abstinent 38.8% ($SD = 34.1$) of possible drinking days (i.e., days not in jail or residential treatment) and consumed a mean of 13.3 ($SD = 9.3$) standard drinks per drinking day. Forty-eight participants (28.9%) met criteria for dependence on one or more drugs (30 for cocaine, 18 for cannabis, 6 for sedatives, and 4 for stimulants). Because of the inclusion criteria, all participants had a BDI score of 15 or greater; the mean BDI was 25.6 ($SD = 8.0$). The mean on the Modified Hamilton Rating Scale for Depression (MHRSD; Miller et al., 1985) was 17.2 ($SD = 8.9$). As reported elsewhere (Ramsey et al., 2004), 54 of the 166 participants did not meet criteria for current depressive disorder, and 17 met criteria for current major depressive disorder at baseline. Of the 95 participants who met criteria for a substance-induced mood disorder with depressive features at baseline, 23 continued to meet full criteria for a major depressive disorder after a 4-week abstinence period (Ramsey et al., 2004).

Measures

An assessment battery was administered pretreatment, at which time participants had a minimum of 2-3 days of abstinence from alcohol. Follow-up interviews were conducted at 6 weeks, 3 months, 6 months, and 12 months following

recruitment into the study, with completion rates of 86%, 93%, 95%, and 93%, respectively. Before each interview, participants provided a breath sample to establish that they were alcohol negative (blood alcohol concentration $< .01$). Interviews were rescheduled on occasions when a breath sample indicated that a participant was alcohol positive. Every effort was made to ensure that the research assistants who conducted the interviews were unaware of treatment condition.

Diagnostic and descriptive measures. Participants provided demographic and background information such as age, gender, years of education, and number of previous alcohol treatments. The lifetime and current prevalence of DSM-III-R (American Psychiatric Association, 1987) alcohol use and affective disorders were determined by the SCID-P (Spitzer et al., 1989). The severity of alcohol dependence was assessed using the Alcohol Dependence Scale (Skinner and Allen, 1982).

Dependent measures of depressive symptoms. The BDI (Beck et al., 1961) and the interviewer-based MHRSD (Miller et al., 1985) were used to assess depressive symptoms. Both self-report and observer-rated measures of depressive symptoms were used because of potential discordance between the two types of measures (Enns et al., 2000).

Dependent measures of alcohol use. The TLFB interview (Sobell et al., 1980) was used to assess drinking frequency and quantity at baseline and during the follow-up intervals. The TLFB was administered at baseline for the 180 days before admission and at each follow-up interval for the period since its last administration. TLFB data include the number of days abstinent from alcohol, amount consumed during each drinking occasion, and the number of days in jail or in residential treatment. One family member or close friend (here termed *significant other*) completed a structured interview concerning the patient's drinking behavior at 3 months, 6 months, and 12 months following study enrollment.

Treatments

All participants received the standard ADTS partial hospital treatment program, which is an abstinence-oriented group treatment that provides treatment daily from 9:00 A.M. to 3:30 P.M., is theoretically grounded in a cognitive social learning model, and includes strong encouragement for participation in 12-step programs. The program has been described in greater detail elsewhere (McCrary et al., 1985) and includes psychoeducation about triggers, functional analysis, drink/drug refusal skills, and medication management. The average length of stay at the ADTS partial hospital program was 3.9 calendar days; thus, the CBT-D and RTC sessions were primarily aftercare treatments. Both the CBT-D and RTC conditions were administered in eight, 45-minute individual treatment sessions that were delivered over a 6-week period on an outpatient basis after discharge from the

ADTS partial hospital program. Detailed therapist manuals were used to ensure standardized delivery of content in both conditions. Doctoral-level psychologists delivered the treatment. Therapists were crossed with treatment assignment, such that each therapist provided treatment to patients in both treatment conditions. The senior author (RAB) trained the therapists and conducted weekly group supervision sessions throughout the study to ensure standardization of protocol delivery.

Cognitive-behavioral treatment for depression. The Coping With Depression course (Brown and Lewinsohn, 1984a, 1984b), modified for use with alcohol-dependent patients, served as the basis for the CBT-D treatment. CBT-D (Brown et al., 1997; Brown and Ramsey, 2000) is an 8-session, individual treatment for depression, incorporating training in several depression-relevant skills, including daily mood monitoring, pleasant activities, constructive thinking, and social skills and assertiveness. This treatment differed from the standard ADTS partial hospital program in that CBT-D focused on depressive symptoms and the relationship between depression and drinking, whereas the ADTS program emphasized changing specific drinking-related thoughts and behaviors.

Relaxation training control. An RTC condition was used to equate for contact time and to provide a more stringent test of the incremental efficacy of the CBT-D treatment. Participants in this condition received eight individual sessions that consisted of training and practice in meditative and deep-breathing techniques (Benson, 1975), Progressive Muscle Relaxation (Jacobson, 1929), and guided imagery. For more details, see Brown et al. (1997). These techniques were presented to patients as viable alternatives to drinking and as coping skills to help decrease feelings of stress and anxiety.

Results

Treatment assignment and compliance

Of the 166 participants who completed a baseline assessment, 161 attended an initial treatment session (80 in RTC and 81 in CBT-D) where they learned of their treatment assignment. Treatment conditions did not differ significantly on demographics, drinking variables, or depression-related variables. Analyses of outcomes are based on this intent-to-treat sample of 161. The number of participants who completed baseline but did not attend a treatment session ($n = 5$) was so small that meaningful comparisons with treatment attendees could not be made. Attendance at treatment sessions also did not differ by condition, $t(159) = 1.45$, $p = .15$. Out of eight sessions, participants attended an average of 7.2 ($SD = 2.0$) in the RTC condition and 6.7 sessions ($SD = 2.4$) in the CBT-D condition. Sixty-four of 83 participants (77.1%) in RTC completed all eight sessions, compared with

57 of 83 (68.7%) in CBT-D. Throughout the study, no serious adverse events were reported. At the 6-month follow-up period, participants in the CBT-D condition were less likely to report additional alcohol or drug treatment, $\chi^2(1) = 6.10$, $p = .01$, or emotional treatment, $\chi^2(1) = 3.42$, $p = .06$, relative to those in RTC. It should be noted, however, that there were disproportionate rates of missing treatment utilization data between the two conditions, with RTC missing 7.5% and CBT-D missing 20.9%.

Validity of self-reports of abstinence

Significant-other reports were used to verify self-reports of abstinence at the 3-, 6-, and 12-month follow-ups. Valid significant-other reports (confident or very confident about their knowledge of participant's drinking) were obtained for 68 of 76 (89%) participants reporting abstinence at 3 months, 48 of 52 (92%) reporting abstinence from 4 to 6 months, and 43 of 49 (88%) reporting abstinence from 7 to 12 months. Of these valid reports, cases in which the participant reported abstinence and the significant other reported that the participant was drinking were rare: 2 of 68 at 3 months, 3 of 48 at 6 months, and 2 of 43 at 12 months. These data provide support for the validity of patients' self-reported alcohol use over the follow-up period. In cases of discordant reports, the worst case (i.e., drinking) was assumed.

Treatment outcome: Alcohol

The percentage of days abstinent and drinks per drinking day in each of the 12 months of follow-up are presented by treatment condition in Figure 2. Before analysis, arcsine (for percentage of days abstinent to correct negative skewness) and square root (for drinks per drinking day to correct positive skewness) transformations were used to improve the distributional properties of these variables. Hierarchical linear modeling (HLM; Bryk and Raudenbush, 1987) was conducted in SAS (SAS Institute Inc., Cary, NC) using PROC MIXED to test between-group differences in individual growth curves over the 12-month follow-up. We conducted analyses using all available data. This allowed us to include 97.5% ($n = 157$) of the sample in the drinking outcome analyses. We initially modeled the random effects of therapist and randomization cohort as separate levels in the model; however, both of these variance terms were non-significant and were therefore dropped.

In each analysis, we included as covariates in the Level 2 model the corresponding variable at baseline as well as gender, baseline BDI score, and history of independent major depressive disorder. Model fit indices indicated that individual growth trajectories (Level 1 model) were best modeled using both linear and quadratic slope terms. The HLMs predicting percentage of days abstinent and drinks

FIGURE 2. Percentage of days abstinent and drinks per drinking day by treatment condition and time. RTC = relaxation training control; CBT-D = cognitive behavioral treatment for depression.

FIGURE 3. Depressive symptoms by treatment condition and time. RTC = relaxation training control; CBT-D = cognitive behavioral treatment for depression.

per drinking day across the 12 months of follow-up indicated the treatment conditions did not differ significantly on the mean levels of either variable ($ps = .92$ and $.83$, respectively). There also were no main effects for gender, baseline BDI score, or history of independent major depressive disorder, nor did treatment condition interact with any of these variables. Although there were significant, negative linear effects and significant positive quadratic effects of time, treatment conditions did not differ significantly in these parameters. Analyses were repeated examining only participants who completed all eight treatment sessions in either condition. Again, differences between conditions were nonsignificant.

Treatment outcome: Depressive symptoms

Mean BDI and MHRSD scores by treatment condition at the 6-week, 3-month, 6-month, and 12-month follow-ups are presented in Figure 3. Before analyses, both variables were subjected to square-root transformation to correct positive skewness. HLM was used to test for differences in individual growth curve parameters in depressive symptoms between treatment conditions. All available data were used in these analyses, providing a sample size of 157. The cohort level of the model was dropped because that variance component was nonsignificant.

In the HLMs predicting BDI and MHRSD scores, we covaried for the corresponding variable at baseline, as well as gender, history of independent major depressive disorder, and time. Based on model fit indices, we modeled time in the Level 1 model using the log-transformation of time of assessment, rather than using both a linear and quadratic effect of time. The Level 2 (between-subjects) parameter estimate for the intercept indicated the treatment conditions did not differ significantly on mean levels of either the BDI or MHRSD across the follow-ups ($ps = .31$ and $.27$, respectively). There also were no significant main effects for gender. Having a history of past or current independent major depressive disorder was associated with greater BDI scores across the follow-ups ($B = 0.47$, $SE = 0.22$, $p = .04$), although the effect did not reach significance with the MHRSD ($B = 0.33$, $SE = 0.20$, $p = .10$). Treatment condition did not interact significantly with any of the other covariates in predicting mean levels of depressive symptoms.

The Level 2 (between-subjects) parameter estimate for the log of time indicated that MHRSD scores decreased significantly over time ($B = -0.13$, $SE = 0.05$, $p = .01$), whereas BDI scores did not ($B = -0.08$, $SE = 0.06$, $p = .16$). The effect of time (i.e., the rate of change in depressive symptoms) differed by condition for BDI scores, with the effect of time being significantly more negative in RTC ($B = -0.35$, $SE = 0.11$, $p = .001$). Given the different rates of change in BDI scores over time, we conducted model-based estimates of treatment effects at each follow-up. These analyses indicated

that, compared with participants receiving RTC, those in CBT-D scored lower on the BDI at the 6-week follow-up ($B = -0.56$, $SE = 0.23$, $p = .02$). However, from that point forward, RTC showed greater reductions in BDI scores relative to CBT-D such that the conditions did not differ significantly on BDI scores at any later follow-ups ($ps > .20$). The effect of treatment condition on rate of change was nonsignificant for MHRSD scores ($p = .11$), although results followed a similar pattern. Analyses were repeated examining only participants who completed all eight treatment sessions in either condition. Again, differences between conditions were nonsignificant.

Discussion

This study examined whether participation in CBT-D in addition to standard alcohol treatment was associated with positive outcomes among alcohol-dependent individuals with elevated depressive symptoms and how those outcomes compared with RTC plus standard treatment. Although we anticipated that both conditions would demonstrate improvement in depressive symptoms, in part related to decreased physiological effects of alcohol during a period of abstinence, we hypothesized that participants receiving CBT-D would report a greater change in depressive and alcohol use outcomes relative to the control condition. Indeed, both treatment conditions demonstrated improvements in depressive and drinking outcomes over time. Compared with RTC, the CBT-D condition had significantly lower levels of depressive symptoms, as measured by the BDI, at the 6-week follow-up. However, this effect was inconsistent because there were no differences in the MHRSD between conditions at the 6-week follow-up and there were no significant differences in depressive symptoms at any other follow-up. Significant between-group differences on alcohol use outcomes were not found, either at posttreatment or during the 12-month follow-up period.

The current findings did not replicate the positive outcomes observed in the CBT-D condition in our previous pilot study (Brown et al., 1997). We considered several possible explanations for why these findings were not replicated. We do not believe that the present findings were the result of a lack of power, because this study was a well-conducted trial with power of $.80$ to detect effect sizes in the small to medium range ($d = .35$ to $d = .40$ depending on the outcome examined) using HLM (Hedeker et al., 1999). Additionally, this study had good treatment attendance and follow-up rates. One possible explanation for the present findings involves consideration of the unanticipated changes to the treatment context that occurred during the intervening time between the two studies. During the time between the pilot project and the current study, the average length of stay in the partial hospital program where the studies were conducted decreased from 21.2 calendar days to 3.9 calendar

days. Because of this dramatic decrease in length of stay, the majority of the treatment sessions in the present study were conducted on an outpatient basis (eight sessions over 6 weeks), whereas the pilot study treatment sessions were conducted *during the course of* partial hospital treatment on 8 consecutive treatment days.

There are several ways that this change in treatment context may have accounted for the different findings between the studies. For example, it is possible that the positive outcomes in the pilot study were the result of a synergistic effect in which CBT-D was more effective when presented concurrently with CBT for alcohol dependence. Another possibility is that because treatment in this study was provided on an outpatient basis, all participants were assured of ongoing follow-up treatment (i.e., either CBT-D or RTC) after discharge from partial hospital treatment, and CBT-D outcomes (relative to RTC) could not outperform the benefits related to this outpatient experience. In any event, the treatment context in which CBT-D was delivered in these two studies was quite different, and there is no way to determine exactly how and whether these differences played a role in the discrepant findings between the studies.

One other interesting point to address is the relationships between treatment, changes in depressive symptoms, and alcohol outcomes. In the previous study, changes in the level of depression mediated alcohol use outcomes. This finding was not observed in the current study. These discrepant findings across studies could be related to the change in treatment context between studies, but they also might have been influenced by alternative unexamined mechanisms. There is accumulating evidence illustrating rapid early response to CBT for depression (Hardy et al., 2005; Tang and DeRubeis, 1999; Tang et al., 2005), problem drinking (Breslin et al., 1997), and other clinical conditions (Stiles et al., 2003; Wilson, 1999). Although there has been a debate regarding the mechanisms responsible for early treatment response (e.g., Hollon, 1999; Ilardi and Craighead, 1999; Tang and DeRubeis, 1999; Wilson, 1999), the observation in the current study of rapid early response in drinking and depressive outcomes in both conditions suggests that treatment effects may have been the result of nonspecific processes.

The current study had several limitations that merit discussion. First, the current study was designed as a replication of a previous pilot study in which CBT-D outperformed RTC in reducing depressive and alcohol outcomes. However, the changes to the treatment context between the two studies made it difficult to compare results, and thus the current study was not a true replication. Second, alternative process variables that may have been related to outcomes were not assessed. Future studies should examine the mechanisms through which relaxation treatment might affect alcohol and depression outcomes in this population. Third, there are characteristics of the current sample that may limit the generalizability of these findings. A large number of potential

participants refused to participate in this study. Although they did not differ from actual participants in gender or age, it is possible that refusers differed from the participants in some meaningful way such that they would have reported different responses to the treatments in this study. Also, given that this study was conducted in a private hospital setting with well-educated, primarily White patients, caution should be used in generalizing the current findings to populations with different characteristics. A final limitation of the current study is that reliability ratings for interview data and treatment adherence were not conducted. Although assessment staff and therapists participated in on-going training and supervision, we cannot conclude with certainty that the interviews and treatments were delivered adequately. We do not believe that the lack of differences in outcomes between conditions was the result of nonadherence to the treatment protocol. However, we are unable to rule out this possibility based on available data.

Future studies evaluating the efficacy of CBT-D in alcohol-dependent individuals with elevated depressive symptoms continue to be warranted. Future investigations might explore the role of treatment context on the efficacy of CBT-D for this population. It is important to clarify whether this treatment has incremental treatment effects only when it works synergistically with CBT for alcohol dependence. Also, future studies might evaluate the relative efficacy of CBT-D provided in a group versus individual format, given the equivalence of these modalities demonstrated in previous work (Brown and Lewinsohn, 1984b). Finally, future studies should examine the efficacy of CBT-D with depressed alcohol-dependent patients whose depressive symptoms do not remit with abstinence. Our results support the idea that, for many people struggling with alcohol dependence, depressive symptoms remit with abstinence and may be the result of the pharmacological effects of alcohol and/or the situational factors related to the crisis that precipitated treatment. Interestingly, in a meta-analysis of medication response for comorbid depression and substance dependence, Nunes and Levin (2004) found that diagnosis of depression after 1 week of abstinence was associated with a greater antidepressant response, and those studies that found large effect sizes on depressive symptoms also showed significant decreases in the quantity of substance use. It is possible that the same kind of pattern exists for the effects of CBT-D on comorbid depression and substance dependence. Thus, we believe that a promising area for future research might involve the use of CBT-D in patients whose depressive symptoms do not remit with abstinence.

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