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Do client attributes moderate the effectiveness of a group cognitive behavioral therapy for depression in addiction treatment?

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Abstract

The study goal was to determine whether client attributes were associated with outcomes from group cognitive behavioral therapy for depression (GCBT-D) as delivered in community-based addiction treatment settings. Data from 299 depressed residential clients assigned to receive either usual care (N=159) or usual care plus GCBT-D (N=140) were examined. Potential moderators included gender, race/ethnicity, education, referral status, and problem substance use. Study outcomes at six months post-baseline included changes in depressive symptoms, mental health functioning, negative consequences from substance use and percentage of days abstinent. Initial examination indicated that non-Hispanic Whites had significantly better outcomes than other racial/ethnic groups on two of the four outcomes. After correcting for multiple testing, none of the examined client attributes moderated the treatment effect. GCBT-D appears effective, however the magnitude and consistency of treatment effects indicate that it may be less helpful among members of racial/ethnic minority groups and is worthy of future study.

Introduction

Depression is the most common co-morbid psychiatric disorder among substance users, with almost half of the individuals receiving addiction treatment having some lifetime history of depression.¹ Moreover, depressed mood is a frequently cited precipitant of relapse among individuals with substance use disorders.^{2, 3} Recent data suggests that providing treatment for depression in addiction treatment settings may improve outcomes⁴⁻⁶ and reduce

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treatment costs,⁷ but it is not yet known whether client attributes moderate this treatment effect. This is an important gap in the literature to address because knowing for whom a particular treatment is effective is relevant to guide future research and treatment dissemination.^{8, 9}

There is an emerging literature that suggests that providing cognitive behavioral therapy for depression (CBT-D) in addiction settings is effective in treating both depression and substance use disorders. For example, Brown and colleagues¹⁰ demonstrated the efficacy of individual CBT-D for reducing depressive symptoms and alcohol use. And a more recent study showed that CBT-D improved depressive and substance use outcomes when integrated with pharmacotherapy and addiction treatment.^{4, 5} However, these studies are limited in answering the question as to whether CBT-D is an effective approach for the heterogeneous populations that seek addiction treatment as the studies had relatively small (e.g., $n = 35$ ¹⁰) and homogenous populations (e.g., primarily white male veterans with alcohol dependence disorders⁴). In addition, these studies were conducted under resource-intensive controlled research conditions that utilized extensive inclusion/exclusion criteria. Therefore, it may be difficult to draw conclusions from this research on whether depressed individuals that typically present to addiction treatment would benefit from CBT-D.

To better address this research question, Baker et al.¹¹ explored the efficacy of providing a brief CBT intervention that focused on either depression and/or alcohol use among depressed hazardous drinkers. The results showed that women tended to respond better to the depression-focused CBT than men whereas men responded better to alcohol-focused CBT than women, suggesting the need to further explore gender differences in response to CBT offered in addiction treatment settings. Moreover, other client attributes that may influence treatment response and can be easily assessed at treatment entry, such as race/ethnicity, education, source of referral and problem substance have not been well studied.

To gain a better understanding of the value of providing CBT-D to the diverse populations in addiction treatment settings, data from a study that implemented a group CBT for depression (GCBT-D) delivered in publicly funded residential treatment settings by trained addiction counselors using minimal participant exclusion/inclusion criteria was analyzed. In a previous report, the treatment was shown to improve depression symptoms, mental health functioning and reduce substance use.⁶ The treatment was also shown to be effective among those meeting criteria for a major depressive disorder.¹² Because the treatment is a group format, if disseminated more broadly, the therapy is likely to be offered to a diverse range of individuals that vary in demographic and other attributes, such as substances used. Moreover, co-occurring disorders tend to be the rule rather than the exception¹³, therefore, an important step in understanding the treatment's effectiveness and dissemination value is to examine its impact on the heterogeneous populations seeking care in addiction treatment settings. Consistent with Kraemer et al.'s^{14, 8} definition of moderation, potential moderators as those attributes present at the time of treatment initiation and uncorrelated with treatment assignment that may have an interactive effect on the intervention were examined. Client attributes that could be easily assessed in typical treatment settings were studied because the goal was to produce results that could inform clinical practice. In accordance with guidelines set forth by Wang,¹⁵ both adjusted and unadjusted treatment effects were calculated and forest plot diagrams to facilitate interpretation of the moderation effects were used.¹⁶

In sum, the following potential treatment moderators were examined: gender, race/ethnicity, education, referral status and problem substance. Previous studies suggest that women may respond better to CBT-D than men.¹¹ CBT-D has not been well-tested among racial/ethnic minority group members with co-occurring substance disorders.¹⁷ Results from a study on low-income medical outpatients demonstrated less improvement for Hispanic participants as

compared to non-Hispanic Whites,¹⁸ suggesting that there may be ethnic differences in CBT-D treatment response. As racial/ethnic status may serve as a proxy for socioeconomic status, educational status as a potential treatment moderator was also studied. It has been shown that offender populations may have difficulty achieving abstinence in community based treatment settings,^{19, 20} so whether a client was referred from the criminal justice system or not was also examined. In terms of substance use, stimulants are well known for having substantially longer residual effects on mood than other substances,²¹⁻²³ therefore the hypothesis that GCBT-D would be less effective with stimulant users as compared to users of other substances (including alcohol) was also assessed.

Methods

Setting

Study sites were four residential programs operated by Behavioral Health Services (BHS), one of the largest publicly-funded alcohol and other drug (AOD) treatment providers in Los Angeles County.

Design

A quasi-experimental design was used in which cohorts of clients at each of the four study sites received either residential treatment as usual (UC) or residential treatment enhanced with the GCBT-D intervention. More information on the assignment schedule is reported in Watkins et al.⁶ Participants assigned to the GCBT-D group had other treatment-related group therapy commitments reduced accordingly so that clients in both study conditions received the same amount of group treatment per week. An intent-to-treat approach was used where every participant that completed a baseline interview was tracked to complete a six-month follow-up interview.

Participants

The study protocol was approved by the research organization's Institutional Review Board and a NIH Certificate of Confidentiality to protect the privacy of study participants was obtained. Study recruitment began in August 2006 and ended in January 2009. During that period a total of 1,262 clients were screened for eligibility and a total of 299 clients experiencing persistent depressive symptoms were enrolled. Persistent symptoms were defined as symptoms measured on two separate occasions after at least two weeks of sobriety. Clients were first screened by residential staff using the Patient Health Questionnaire (PHQ-8²⁴) 14 days after entering treatment. Clients with a score five or greater (corresponding to at least mild depression symptoms) were asked whether research staff could contact them. Fifty-nine percent of the clients screened at two weeks scored five or greater on the PHQ-8. Next, the research team conducted a second screening to determine eligibility; 9% of the sample refused the second screening or their contact information was lost, and 5% were discharged from the program before the second screening. Inclusion criteria included: 1) Beck Depression Inventory-II (BDI-II) scores >17, indicative of moderate to severe depressive symptoms;^{25, 26} and 2) the ability to speak and understand English. Exclusion criteria included a positive screen for a self-reported bipolar disorder,²⁷ schizophrenia (using an item from the Healthcare for Communities Psychoticism screener²⁸), or cognitive impairment.²⁹ Clients on federal probation or parole were also excluded as permission from the Federal Parole Board was not obtained. Approximately 24% of the population entering treatment met study eligibility criteria and agreed to participate in the study.

Study Conditions

Intervention Condition

The GCBT-D intervention was adapted from a manual with demonstrated efficacy.^{30, 31} The GCBT-D included 16 two-hour group sessions, divided into four modules: Thoughts, activities, people interactions, and substance use.³² The group was delivered twice a week using a semi-open enrollment procedure such that new clients could enter the group at the beginning of each the four modules (i.e., every four sessions or every two weeks). Participants assigned to GCBT-D attended a mean of 10.5 sessions (SD=5.5) and 69% attended at least half of the 16 sessions.

The intervention was co-led by two addiction treatment counselors trained to deliver this treatment and not provide other care at the residential sites in order to avoid contamination across study conditions. The counselors were employed at other sites and traveled to the residential sites to deliver the intervention. Five counselors were trained to deliver the intervention over the course of the study. Four counselors were female and one was male, and reported a variety of racial/ethnic backgrounds (two were Black, two were Hispanic, one was White). At the time they were selected for training, counselors had an average of 4.2 years of experience in addiction treatment, three counselors were in recovery from drugs or alcohol and four had completed an alcohol and drug addiction certification program (i.e., CADAC) from the state of California. All of the counselors reported that they had heard of CBT, but only one had received any prior training and supervision in CBT. More details on counselor training and fidelity are reported elsewhere;^{33, 34} results indicated high adherence and competence to the treatment protocol.

Comparison Condition

The comparison condition consisted of treatment as usual (i.e., usual care or UC). Treatment across the sites was standardized. Clients experienced similar enrollment procedures and participated in individual substance use treatment counseling, group therapy, vocational skills training, AA/NA/CA meetings, recreational therapy, and family services. Residential staff were instructed to follow their usual mental health care procedures of referring clients with severe mental health conditions to a community mental health provider for evaluation and treatment. Residential staff did not report receiving any formal mental health training before or during the study and did not receive any training in the GCBT-D during the study period.

Procedures

Treatment Assignment

Participants meeting study criteria were enrolled in one of two study conditions: UC or UC plus 8 weeks (16 sessions) of GCBT-D approximately three-four weeks after admission to residential treatment. Intervention clients started GCBT-D within two weeks after study enrollment.

Data Collection

Following screening and consent, participants completed a semi-structured baseline interview conducted by trained field staff. Six months after the baseline interview, corresponding to approximately three months after the intervention was concluded, the follow-up interview was administered by survey field staff. Participants received \$20 for completing the baseline and \$30 for completing the 6-month follow-up interview.

Measures: Candidate Moderators

Demographic Characteristics

Gender and race/ethnicity of participants were obtained by self-report. Participants were categorized into one of two education categories: “less than high school” and “high school diploma/G.E.D or higher”. *Referral Status.* Participants that reported being referred from the criminal justice system (i.e., a court, probation officer, parole officer, state office of pardon and parolees) were classified separately from those reporting referral from another source (i.e., self, spouse or partner, other family member, friend or acquaintances, or employer). *Problem Substance.* Using a modified version of an item from the Addiction Severity Index,³⁵ participants reported which substance was most problematic. Next, responses were classified into one of two categories: stimulants (cocaine and amphetamines) versus all others (alcohol, heroin, methadone, other opiates/analgesics, barbiturates, sedatives/hypnotics/tranquilizers, cannabis/marijuana, hallucinogens, and inhalants).

Measures: Outcomes

The four outcomes were changes in: 1) depressive symptoms as measured by the BDI-II; 2) mental health functioning using the mental health composite score (MCS) derived from the 12-item Short-Form General Health Survey;³⁶ 3) negative consequences from substance use as measured by the Shortened Inventory of Problems modified for alcohol and drug use (SIP-AD³⁷); and 4) percentage of days abstinent (PDA) using the TimeLine Followback method³⁸ for alcohol use and Addiction Severity Index³⁵ for past 30-drug use. The days abstinent out of days available to use (i.e., not residing in an institutionalized setting, like a hospital, treatment center or jail/prison) was calculated.

Given this sub-study is a secondary analysis, 80% power to detect significant ($p < .05$, two-sided) small-to-medium effect sizes was first confirmed.³⁹ For the PDA variable, similar power was detected for testing for differences in the relative percentage of days abstinent of 15-19% between two levels of a moderator variable. But for testing a four-level measure as a moderator of GCBT-D's effect on PDA (e.g., race/ethnicity), detectable effect sizes were unrealistically large, so instead a two-level measure (i.e., Whites versus Non-Whites) was used.

Analytic Strategy

Each outcome was modeled using generalized linear modeling. Gaussian error distributions and identity link functions were assumed for the models of BDI-II, MCS, and SIP-AD. A Poisson error distribution and log link function assumed for modeling PDA, with an offset term included in the model to account for the number of days available to each participant for substance use. Graphical residual analyses were conducted to confirm the appropriateness of these distributional assumptions. A multiple membership model was used to account for the non-independence, or intra-cluster correlation (ICC), of outcomes among those who attended GCBT-D sessions together, which involved including random session effects in the model and estimating the client-specific session effect as an average of the random session effects for those sessions attended by the client.⁴⁰ Site was treated as a covariate in all models to control for possible differences in outcomes across the four sites. The baseline value of the outcome measure was also controlled for when examining BDI-II, MCS and SIP-AD outcomes. In addition, significant ($p < .10$) bivariate baseline differences between the GCBT-D and UC group on baseline measures that could be related to the outcomes were also tested. If a significant bivariate relationship was found, the measure was included as a covariate.

First, the effect of the intervention was tested by examining the statistical significance of the regression coefficient for the intervention assignment indicator in models of each outcome regressed on the indicator of intervention assignment and the aforementioned covariates. To test each moderation hypothesis, a candidate moderator was added to the base model as a main effect and also interacted with the intervention assignment indicator, with the statistical significance of the interaction term indicating whether intervention effects were moderated as hypothesized.

Since the tests of moderation are secondary analyses and involve multiple hypotheses testing, several steps were taken to avoid over-interpreting the results given the possibility of Type one errors.¹⁵ First, all tests of moderation are based on the test of interaction of the intervention assignment indicator and candidate moderator rather than examining whether there are differences in the significance of the treatment effect across levels of the moderator. Second, graphical presentation of the results using forest plots to highlight how the variation in treatment effects across moderator levels varies with respect to the main effect were examined.¹⁶ Multiple testing bias was accounted for by examining whether statistically significant effects hold when controlling the false discovery rate, which is the proportion of falsely significant results among all statistically significant results,⁴¹ examining results when the false discovery rate varies between 5-20%. Also, uncorrected p-values are reported to facilitate comparisons to other studies in which the false discovery rate was not controlled.⁴²

To assess the potential effect of missing data on results, differences in characteristics of follow-up respondents and non-respondents were tested using chi-squared tests for categorical characteristics and t-tests for continuous variables. Analyses of PDA were performed on clients with any days available for use in the 30-day window (65% of the sample). A chi-squared test was used to compare whether the percent of clients in GCBT-D versus UC conditions had similar days available for use.

Results

Descriptive Analyses

At baseline, GCBT and UC participants did not significantly differ on most measured characteristics (see Table 1). Statistically significant differences were found with respect to attending a self-help group ($\chi^2(1) = 4.138, p = .041$) and being homeless in last 6 months ($\chi^2(1) = 3.865, p = .049$) and therefore these two variables were included as covariates in the analyses.

The response rate for the six-month interview was 85.6% ($n = 256$ participants). Response rates did not significantly differ between the GCBT-D and UC conditions ($\chi^2(1) = 0.08, p = .77$). At the time of the six-month follow-up, two-thirds of the sample had available days to use (i.e., were not institutionalized) and there were no difference across study condition (GCBT-D = 64% with days available to use as compared to UC = 66%, $p = .63$). The length of stay in residential treatment did not differ between study conditions (GCBT-D Mean (SD) = 130.4 (72.3) days compared to UC Mean (SD) = 128.9 (68.8) days, $p = .87$). The percentage of clients reporting receiving external mental health treatment was also not statistically significant (i.e., 19% in GCBT-D group and 26% in UC group, $p = .24$) suggesting that participants received similar levels of care outside of the study.

Main Treatment Effects

Table 2 shows a summary of the intervention effect across the four outcomes. For each measure, the intervention significantly improved client outcomes by reducing depressive symptoms, improving mental health functioning, decreasing negative consequences from

use and increasing the percentage of abstinent days. The results from depressive symptoms, mental health functioning, and days of use are reported elsewhere⁶.

Moderator Analyses

A summary of the results from the moderation analyses for each of the four outcome measures is presented in forest plots (see Figures 1-4). Results for BDI-II (Figure 1), MCS (Figure 2), and SIP-AD (Figure 3) are provided in terms of the difference at six months between the GCBT-D and UC conditions on the scale of their measurement, while for PDA the incidence rate ratio, or the percent increase in days abstinent, at six months for the GCBT-D versus UC condition is reported (Figure 4). The intervention effects for each subgroup are indicated with solid dots, and the corresponding 95% confidence intervals (CIs) reflect the uncertainty in these estimates. Two vertical lines are superimposed on each forest plot: A dashed line reflecting the null hypothesis of no intervention effect and a solid line reflecting the main intervention effect (as shown in Table 2). To facilitate comparisons across all four outcomes, estimates to the right of the dashed vertical line indicate where GCBT-D outperforms the UC condition.

In Figure 1, the intervention effects across the gender, education, and problem substance groups do not appear significantly different. However, for the race/ethnicity variable, the decrease in depressive symptoms for non-Hispanic Whites is greater than the overall intervention effect and for responses by Black/African Americans, Hispanics, and clients classified in the other race/ethnicity group (uncorrected $p < .05$). More specifically, non-Hispanic Whites reduced depressive symptoms by 12 points on average whereas reductions of three points and two points on average were observed for Hispanic and Black/African-American participants, respectively. One other potential moderator on the change in BDI-II (uncorrected $p < .10$) was referral type, with greater decreases in depressive symptoms for those with a criminal justice referral to treatment.

In Figure 2, the race/ethnicity variable showed a similar pattern on mental health functioning as found on the BDI-II, with non-Hispanic Whites showing greater improvements in functioning (i.e., 10 points) than Hispanics (i.e., 5 points), Black/African-Americans (i.e., zero points) and clients classified in the “other” group (i.e., -1 point; uncorrected $p < .10$). Although the pattern of responses in changes in functioning were similar to the changes on the BDI-II for the referral status variable, the pattern was not statistically significant. No other variables appeared to moderate the treatment effect.

Figure 3 shows that the only potential moderator for negative consequences from use is the problem substance variable, with stimulant users reporting less change over time than clients reporting other substances (including alcohol) as their problem (uncorrected $p < .05$). With regard to PDA (Figure 4) and consistent with the mental health outcomes, GCBT-D was more likely to result in an increase in the number of days abstinent for non-Hispanic Whites (mean percentage change = 37%) than clients from other racial/ethnic groups (mean percentage change = 12%) (uncorrected $p < .05$). GCBT-D was associated with marginally significantly more abstinent days for those with a criminal justice referral than other forms of referral (uncorrected $p < .10$).

Across each of the four outcomes, we confirmed that the results were similar when controlling for other client attributes, suggesting that the observed effects are not explained by correlation with other moderators (e.g., the race/ethnicity findings can be explained by education level). None of these results were statistically significant after accounting for multiple testing.

Discussion

The study results show that a GCBT-D provided by addiction counselors is associated with improved mental health and substance use outcomes across a broad range of clients receiving residential addiction treatment, including those who differ on gender, education, referral status, and problem substance use. Identification of potential moderators of GCBT's effectiveness helps address the National Institutes of Health's goal to provide personalized, predictive and preventive treatment.⁴³ As stated by Wang et al.,¹⁵ subgroup analyses that are carefully conducted and reported can provide valuable information from a costly and effortful clinical trial about the therapeutic benefits of a treatment. While others studying treatment moderation in the addiction field have reported unadjusted p-values in order to err on the side of identifying potentially important moderators,⁴² both adjusted and unadjusted results were reported in order to avoid over-interpretation of the uncorrected test results. These findings may assist in developing more cost effective designs by knowing in advance which variables should be stratified.⁴⁴

Implications for Behavioral Health

The study findings are important in that they provide the basis for future hypotheses-driven research.⁸ Furthermore, given the heterogeneity in substance use treatment populations and the prevalence of co-occurring depression in these settings, it is of great clinical importance to understand the effectiveness of treatments to address multiple conditions. For example, it did not appear that gender, education, referral status or problem substance consistently moderated the treatment effect on both mental health and substance related outcomes. However, the magnitude and consistency of the race/ethnicity effects suggest that although not statistically significant, race/ethnicity may be a clinically meaningful treatment moderator and it is worthy of consideration as a stratification variable in future studies. For example, non-Hispanic Whites demonstrated a clinically meaningful decline in depressive symptoms, the average observed change was from the moderate to minimal range on the BDI-II. However, Hispanics, Black/African-Americans and clients who reported "other" for race/ethnicity, did not report clinically meaningful declines in depressive symptoms with the average improvement no greater than 3 points, which is not clinically meaningful.

The race/ethnicity variable may serve as a proxy for other unobserved factors that might influence treatment outcomes. Marsh et al.⁴⁵ reported that racial and ethnic minorities typically enter treatment with limited social and economic support, and African American and Hispanics encounter more barriers to accessing treatment.⁴⁶ Post-hoc results from previous CBT-D studies have found that Hispanics were more likely to drop-out of treatment prematurely than non-Hispanic Whites.¹⁸ In this study, post-hoc analyses revealed no differences between the racial/ethnicity groups in terms of the number of GCBT-D sessions attended or the time in addiction treatment, suggesting that the study findings are not due to differences in retention or exposure to the treatment. It is also relevant that the GCBT-D intervention was tested in a residential setting and therefore competing demands and resource issues that may have deterred participation in previous studies (e.g., transportation) were less of a barrier to treatment participation in this study. In sum, it appears that members of racial/ethnic minority groups received similar levels of treatment but did not respond as well as non-Hispanic Whites.

It is also important to recognize that considerable heterogeneity may exist within the racial/ethnic groups that were studied. The Hispanic group may include individuals that differ in terms of genetic, social, historical and cultural characteristics.^{47, 48} The individuals assigned to "other" race/ethnicity group were composed of participants who reported mixed racial/ethnic identities. As a result, there may be important subgroups that potentially respond

differently to the treatment that were masked by combining these groups in our analyses.⁴⁹ Future research conducted with larger sample sizes of members of racial/ethnic minority groups may help to determine CBT's effectiveness for these individuals.

Support for a differential treatment effect for men and women as shown in previous research was not found, however it is important to keep in mind several differences between this study and previous work that reported gender differences.¹¹ First, this study examined the impact of a group-based therapy that was delivered in the context of residential addiction treatment. Baker et al.¹¹ examined the impact of providing either CBT with a depression or alcohol focus in an individualized treatment setting. Second, this study included those receiving treatment for alcohol and/or other substances. Therefore, all participants in this study received some form of substance use treatment. Baker et al.¹¹ examined specifically hazardous drinkers. The results from both studies suggest that CBT is an effective treatment approach and providing treatment that addresses both mood and problem use may be superior to single-focused treatments.

Study Limitations

This study has some limitations. First, the study was quasi-experimental. While a randomized design would have been a stronger test of causality, the logistics of a randomized design were not feasible. The study results demonstrated that the clients assigned to the GCBT-D and UC groups were well-balanced on observed baseline characteristics, improving confidence in attributing the effects demonstrated to the intervention. Further, no site differences were detected. A second limitation of the study is that it was conducted in residential treatment. The mean length of stay (i.e., 130 days) was similar to the average residential stay reported among treatment completers nationally (i.e., 128 days,⁵⁰), but the generalizability of the study findings to shorter intensity treatments which are increasingly more common is unknown. Third, this study represents secondary analyses. Recruitment on the basis of the potential moderators was not done, but a check that adequate statistical power to examine our study hypotheses was conducted. Fourth, individual-level factors such as motivation or self-efficacy, which could have moderated the treatment effect were not examined. Others have noted that these attributes may impact response to a cognitive therapeutic approach.^{51, 52} Because the goal of this study was to provide results that could be easily utilized in typical practice settings, moderators were selected that typical substance use treatment programs assess at intake. Fifth, treatment mediation was not studied. To better understand how GCBT-D works and why it may be more or less effective for some subgroups, it would be helpful for future studies to examine mediation.

Summary and Conclusions

The study findings suggest that GCBT-D as delivered by addiction treatment counselors may improve both mental health and substance use outcomes across a heterogeneous client populations, however, more research is needed to determine whether the characteristics identified before adjustment (e.g., racial/ethnic group status) imply the need for modifications or alternative modes of treatment. Although no differences in treatment retention were observed across groups, members of racial/ethnic minorities did not exhibit the same levels of improvement in mental health and substance use outcomes as their non-Hispanic White counterparts. These findings demonstrate the need to develop and test treatment approaches that better meet the health disparities between racial/ethnic groups for co-occurring depression and substance use.

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Dashed vertical line: No GCBT-D effect (null hypothesis). Solid vertical line: Average GCBT-D effect.

Figure 1.
Mean six-month treatment effects between the GCBT-D and UC conditions among subsamples on the BDI-II scale

Dashed vertical line: No GCBT-D effect (null hypothesis). Solid vertical line: Average GCBT-D effect.

Figure 2.
Mean six-month treatment effects between the GCBT-D and UC conditions among subsamples on the MCS scale

Dashed vertical line: No GCBT-D effect (null hypothesis). Solid vertical line: Average GCBT-D effect.

Figure 3.
Mean six-month treatment effects between the GCBT-D and UC conditions among subsamples on the SIP-AD

Dashed vertical line: No GCBT-D effect (null hypothesis). Solid vertical line: Average GCBT-D effect.

Figure 4.

Six-month incidence rate ratio in days abstinent (percent increase in days abstinent) between the GCBT-D and UC conditions among subsamples

Table 1

Study sample baseline characteristics: Participants assigned to Group Cognitive Behavioral Therapy for depression (GCBT-D) and Usual Care (UC)

Characteristic	Overall (N=299)	GCBT-D (N=140)	UC (N=159)
Age (years), Mean (SD)	36.2 (10.3)	35.3 (10.1)	37.0 (10.5)
Gender, % Male	51.8	50.0	53.5
Ethnicity, %			
White	33.8	37.1	30.8
Hispanic	30.1	27.9	32.1
African American	22.4	23.6	21.4
Other	13.7	11.4	15.7
Education (years), Mean (SD)	11.9 (2.0)	11.8 (2.1)	12.0 (2.0)
Married, %	18.4	18.6	18.2
Employed (full or part-time), %	16.4	15.7	17.0
Homeless (past 6 months), % [*]	43.1	37.1	48.4
Mental Health Measures			
BDI-II score, Mean (SD)	33.5 (9.2)	32.7 (8.9)	34.2 (9.5)
Taking psychiatric medication, %	19.1	19.3	18.9
CIDI, current depressive disorder, % ^a	45.8	46.4	45.3
Substance Use Measures			
Negative consequences from use	30.6 (11.8)	29.5 (13.2)	31.5 (10.3)
Lifetime			
Ever received AOD treatment, %	86.0	85.0	86.8
Past 12 months			
AUDIT-C, probable alcohol use disorder, %	66.2	67.1	65.4
ASI Alcohol Evaluation Index, Mean (SD)	54.1 (9.8)	54.0 (9.2)	54.1 (10.4)
ASI Drug Evaluation Index, Mean (SD)	47.5 (7.5)	47.9 (7.8)	47.2 (7.1)
Problem substance, %			
Amphetamines	36.8	40.0	34.0
Cocaine	20.4	21.4	19.5
Alcohol	15.4	12.9	17.6
Heroin/Other Opiates/Analgesics Methadone	12.4	12.9	12.0
Alcohol and one or more drugs	7.0	4.3	9.4
More than one drug but no alcohol	3.3	2.1	4.4
Cannabis/Marijuana	3.3	5.0	1.9
Hallucinogens Sedatives/ Any other drug	1.3	1.4	1.3
Past 30 days			
Attend self-help group, % ^{**}	36.1%	42.1%	30.8%
Any arrest, %	18.4	15.0	21.4
Institutionalized for all 30 days, %	15.7	14.3	17.0
Percentage of days abstinent, Mean (SD) ^b	42.1 (40.0)	43.7 (40.8)	40.7 (39.4)

Note: BDI-II = Beck Depression Inventory-II; CIDI⁵¹ = Composite International Diagnostic Interview; AOD = alcohol or other drug; AUDIT-C = Alcohol Use Disorders Identification Test – Consumption; ASI⁵² = Addiction Severity Index.

^aIncludes major depression and dysthymia.

^bFrom problem substance on days available to use.

* denotes $0.05 < p < 0.10$ between GCBT-D and UC groups.

** denotes $p < 0.05$ between GCBT-D and UC groups

Table 2

Intervention main effects: Improvement in outcomes for the GCBT-D versus UC group at 6-month follow-up

Outcome	Sample size	Change (positive: intervention is better)	95% Confidence Interval	t-statistic	p-value
Decrease in BDI-II	256	5.9 points	(2.7, 9.1)	3.66	<.001
Increase in MCS	256	4.7 points	(1.3, 8.1)	2.68	.008
Decrease in SIP-AD	256	4.2 points	(1.1, 7.4)	2.64	.009
Increase in PDA	141	19.6% more days	(5.4%, 35.7%)	2.77	.007

Note: BDI-II denotes Beck Depression Inventory II scores; MCS refers to the mental health composite score derived from the 12-item Short-Form General Health Survey; SIP-AD denotes scores from the Shortened Inventory of Problems for Alcohol and Drug Use; PDA refers to percentage of days abstinent on days available in the past 30. Results from the BDI-II, MCS, and PDA are reported elsewhere 6