Cognitive Behavioral Therapy for Adults with Substance Abuse Disorders: A Meta-Analysis of Randomized Controlled Trials Since 2007

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Abstract

A meta-analysis was conducted assessing the effectiveness of cognitive behavioral therapy (CBT) to treat persons with substance abuse disorders (SUD) to update a previous study by Magill and Ray (2009). Magnitude of treatment effects were analyzed from randomized controlled trials of cognitive behavioral therapy related to substance use disorders conducted between 2007-2011. A subgroup was created based on similar inclusion criteria and the use of the BDI-II as a dependent variable. Grand means were then calculated for the entire study and subgroup #1. The results are consistent with the prior research, suggesting that CBT has a small effect size when used to treat SUD. Findings from this study also suggest that CBT is a very viable option for treating depressive symptoms in adults with SUD.

Cognitive behavioral therapy (CBT) is a modality for treatment that has been assessed and employed as a viable form of treatment for a wide array of behavioral disorders. Given the current trend in counseling psychology towards the use of evidence-based practices and empirically supported treatments, it is important for practitioners and clinicians alike to employ methods that have evidence of success with clients. It also is important to use evidence-based practices in order to receive reimbursement from 3rd party payers (Thomason, 2010). The research on the use of CBT to treat substance use disorders (SUD) has generally produced results that

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support its use (Magill & Ray, 2009). The National Institute on Drug Abuse (2012) reports that behavioral types of counseling, whether individual or group, are most commonly used in the treatment of substance use disorders. The goal of these behavioral approaches is to help people become aware of thoughts and feelings that lead to problematic substance use and to develop coping skills that help a person gain and maintain sobriety. Given that CBT is a frequently used intervention for substance use disorders and that the prior research generally supports its use, it is important to keep the research current and up to date regarding the utilization of CBT to treat SUD.

The purpose of the current study was to provide an update to the previous literature regarding the use of cognitive behavioral therapy as it is applied to treat substance use disorders. Magill and Ray (2009) conducted a meta-analysis on randomized controlled trials of CBT with adult alcohol and illicit drug users. A goal of their article was to provide a systematic review of the prior research on CBT for SUD that existed between the years of 1980 and 2006. The current study is a synthesis of studies conducted between the years of 2007 to 2011, with the goal of examining the efficacy of CBT when used to treat SUD in adults.

Method

A meta-analysis was conducted to update the prior meta-analysis research. A Cohen's *d* effect size statistic was used to quantify the effectiveness of CBT as compared to other types of treatment modalities used to treat SUD. A grand mean was then calculated for the entire study. This was achieved by multiplying each article's sample size by its effect size. The numbers produced were added together and then divided by the total sample size of all eleven articles. A subgroup was then developed by grouping five articles together, based on the use of the Beck Depression Inventory – Second Edition (BDI-II) as a common measure. A grand mean was then calculated using the same procedure as described above to quantify the effectiveness of CBT on depressive symptoms in adults with substance use disorders.

Inclusion Criteria

Inclusion criteria were used to select articles for the present meta-analysis mostly based upon those used by Magill and Ray (2009). The inclusion criteria for this article

are as follows: (1) The studies needed to be randomized controlled trials that were quantitative in nature. (2) The studies had to examine a form of cognitive behavioral therapy that could be considered relapse prevention or coping skills training. The form of treatment could be delivered in an individual or a group setting. (3) The study participants needed to be aged 16 years and over and have an active substance abuse diagnosis as determined by the DSM-IV. (4) Studies needed to be reported in the English language and published from 2007 to the present date in 2011.

A literature search was conducted using the inclusion criteria. Search terms used included "randomized controlled trials, CBT, alcohol, drugs, relapse prevention, and coping skills training" using the EBSCO host search engine. Articles that met the inclusion criteria for this study were extracted and then used to compare CBT and other modalities of treatment to address substance use disorders. Cohen's d statistics were calculated to measure the differences between CBT and comparison treatments.

Results

After undergoing a literature search utilizing the inclusion criteria mentioned above, a total of eleven articles were extracted for analysis. The results of this study show one study with a large effect size ($d > \pm .80$), three studies that reflect a medium effect size ($d > \pm .50, < \pm .80$), and seven studies that fall in the small effect size range ($d < \pm .50$) (see Table 1 for treatment type and treatment comparison effect size). The grand mean for the present study ($N = 913$) indicated a small effect size ($d = .39, d < \pm .50$) for CBT when compared with another type of treatment for adults with SUD. The grand mean for the depressive symptoms subgroup ($N = 440$) fell in the large effect size range ($d = 1.10, d > \pm .80$) (see Table 2).

Table 1

Effect Size for CBT vs. Treatment Comparison

First Author	*N*	Type of Treatment	Treatment Comparison	Drug of Choice	Outcome	*d* (95% CI)
Baker (2009)	143	CBT-A	CBT-I	Alcohol	BDI Scores	.35 (.02, .68)
Brown (2011)	161	CBT-D	RTC	Alcohol	Tx Sessions	-.23 (-.54, .08)
Jaffe (2007)	71	CBT	CM & CBT	Meth	BDI Scores	1.43 (1.18, 1.69)
Kay-Lambkin (2009)	41	CBT-A	BI	Alcohol	Drinks per Day	-.50 (-.94, -.06)
Kiluk (2010)	52	TAU + CBT4CBT	TAU	Alcohol + Drugs	Number of Coping Responses	.57 (.02, 1.13)
Litt (2008)	120	MET/CBT	CM	Marijuana	Self-Efficacy	.23 (-.13, .59)
McGovern (2011)	53	CBT-I	IAC	Drugs	Drug Use (days)	-.60 (-1.16, -.04)
Morgenstern (2007)	89	MI + CBT	MI	Alcohol	Drinks per Day	.14 (-.27, .56)
Smout (2010)	104	CBT	ACT	Meth	BDI Scores	-.18 (-.57, .21)
Vedel (2008)	64	CBT	BCT	Alcohol	Alcohol Consumed (units)	.35 (-.14, .85)
Villanueva (2007)	15	CBT	TSF	Alcohol	Drinks per Day	-.42 (-1.44, .61)

Note. CBT-A = CBT-Alcohol, CBT-I = CBT-Integrated, CBT-D = CBT-Depression, RTC = Relaxation Training Control, CM = Contingency Management, BI = Brief Intervention, TAU = Treatment as Usual, CBT4CBT = Computer-based CBT, MET = Motivation Enhancement Training, IAC = Individual Addiction Counseling, MI = Motivational Interviewing, ACT = Acceptance and Commitment Therapy, BCT = Behavioral Couples therapy, TSF = 12 Step Facilitation.

Table 2

Effect Size Grand Means for Subgroup #1 Based on Pre/Post BDI-II Scores

First Author	N	d (95% CI)	$\mid N \times d$ sum $\mid$	Grand Mean d
Baker (2009)	71	-.76 (-1.10, -.41)	53.96	
Jaffe (2007)	145	-1.43 (-1.69, -1.18)	207.35	
Kay-Lambkin (2009)	67	-1.87 (-2.27, -1.46)	125.29	
McGovern (2011)	53	-.12 (-.50, .26)	6.36	
Smout (2010)	104	-.88 (-1.17, -.60)	91.52	
Subgroup #1 Total	440		484.48	1.10

Discussion

The overall results from the present study are consistent with the results from the previous study conducted by Magill and Ray. Both Magill and Ray's study and the present study identified a small effect size for CBT when used to treat SUD. Magill and Ray (2009) found a statistically significant pooled CBT effect ($g = .144$). The findings from both Magill and Ray and the present study suggest that CBT has a small, but useful effect when treating substance use disorders with adult populations. Another interesting finding from the present study was the effect ($d = 1.10$) that CBT had on depressive symptoms. The findings from the depressive symptom subgroup in the present study suggest that CBT may be a very viable option when treating depressive symptoms in adults with SUD.

References

Baker, A.L., Kavanaugh, D.J., Kay-Lambkin, F.J., Hunt, S.A., Lewin, T.J., Carr, V.J., & Connolly J. (2009). Randomized controlled trial of cognitive-behavioural therapy for coexisting depression and alcohol problems: Short-term outcome. *Addiction*, *105*, 87-99.

Brown, R.A., Ramsey, S.E., Kahler, C.W., Palm, K.M., Monti, P.M., Abrams, D., Dubreuil, M., & Gordon, A. (2011). A randomized controlled trial of cognitive-behavioral treatment for depression versus relaxation training for alcohol–dependent individuals with elevated depressive symptoms. *Journal of Studies on Alcohol and Drugs, 72(2),* 286-296.

Jaffe, A., Shoptaw, S., Stein, J.A., Reback, C.J., Rotheram-Fuller, E. (2007). Depression ratings, reported sexual risk behaviors, and methamphetamine use: Latent growth curve models of positive change among gay and bisexual men in an outpatient treatment program. *Experimental and Clinical Psychology*, *15(3),* 301-307.

Kay-Lambkin, F.J., Baker, A.L., Lewin, T.J., & Carr, V.J. (2009). Computer-based psychological treatment for comorbid depression and problematic alcohol and/or cannabis use: A randomized controlled trial of clinical efficacy. *Addiction*, *105*, 378-388.

Kiluk, B.D., Nich, C., Babuscio, T., & Carroll, K.M. (2010). Quality versus quantity: Acquisition of coping skills following computerized cognitive-behavioral therapy for substance use disorders. *Addiction*, *105*, 2120-2127.

Litt, M.D., Kadden, R.M., Kabela-Cormier, E., & Petry, N.M. (2008). Coping skills training and contingency management treatments for marijuana dependence: Exploring mechanisms of behavior change. *Addiction, 103*, 638-648.

Magill, M., & Ray, L.A. (2009). Cognitive-behavioral treatment with adult alcohol and illicit drug users: A meta-analysis of randomized controlled trials. *Journal of Studies on Alcohol and Drugs*, *70*(*4),* 516-527

McGovern, M.P., Lambert-Harris, C., Alterman, A.I., Xie, H., & Meier, A. (2011). A randomized controlled trial comparing integrated cognitive behavioral therapy versus individual addiction counseling for co-occurring substance use and posttraumatic stress disorders. *Journal of Dual Diagnosis*, *7(4)*, 207-227.

Morgenstern, J., Irwin, T.W., Wainberg, M.L., Parsons, J.T., Muench, F., Bux Jr., D.A., Kahler, C.W., Marcus, S., & Schulz-Heik, J. (2007). A randomized controlled trial of goal choice interventions for alcohol use disorders among men who have sex with men. *Journal of Counseling and Clinical Psychology*, *75(1)*, 72-84.

U.S. Department of Health and Human Services, National Institutes of Health, National Institute of Drug Abuse. (2012). *Treatment approaches for drug addiction.* Retrieved from http://www.drugabuse.gov/infofacts/treatmeth.html.

Smout, M.F., Longo, M., Harrison, S., Minniti, R., Wickes, W., & White, J.M. (2010). Psychosocial treatment for methamphetamine use disorders: A preliminary randomized controlled trial of cognitive behavior therapy and acceptance and commitment therapy. *Substance Abuse*, *31*, 98-107.

Thomason, T.C. (2010). The trend toward evidence-based practice and the future of psychotherapy. *American Journal of Psychotherapy, 64(1)*, 29-38.

Vedel, E., Emmelkamp, P.M.G., & Schippers, G.M. (2008). Individual cognitive-behavioral therapy and behavioral couples therapy in alcohol use disorder: A comparative evaluation in community-based addiction treatment centers. *Psychotherapy and Psychosomatics*, *77*, 280-288.

Villanueva, M., Tonigan, J.S., & Miller, W.R. (2007). Response of Native American clients to three treatment methods for alcohol dependence. *Journal of Ethnicity in Substance Abuse*, *6(2)*, 41-48.