Journal of Consulting and Clinical Psychology
1989, Vol. 57, No. 3, 414-419

0022-006X/89/$00.75

A Meta-Analysis of the Efficacy of Cognitive Therapy for Depression

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In meta-analysis format the effectiveness of Beck's cognitive therapy for depression was reviewed. Twenty-eight studies were identified that used a common outcome measure of depression, and comparisons of cognitive therapy with other therapeutic modalities were made. The results document a greater degree of change for cognitive therapy compared with a waiting list or no-treatment control, pharmacotherapy, behavior therapy, and other psychotherapies. The degree of change associated with cognitive therapy was not significantly related to the length of therapy or the proportion of women in the studies, and although it was related to the age of the clientele, a lack of adequate representativeness of various age groups renders these results equivocal. Implications for further outcome and process studies in cognitive therapy are discussed.

Past meta-analytic reviews on the treatment of depression have suggested that psychotherapy is reliably more effective than either no treatment or placebo control conditions (Miller & Berman, 1983; Shapiro & Shapiro, 1982; Steinbrueck, Maxwell, & Howard, 1983). These reviews, as is true of most meta-analyses, have the shortcoming that they analyzed the effects of therapies without regard to specific models of psychotherapy. For example, in their study Miller and Berman (1983) openly acknowledged that "the studies included in this review encompassed a broad spectrum of treatments, ranging from therapies that are sometimes labelled as cognitive to therapies that explicitly combine cognitive and behavioral techniques" (p. 41). Although such broad analyses are useful in establishing the effectiveness of generic types of therapy, they run the risk of masking or enhancing the effects of specific models and methods of therapy.

Previous meta-analyses have been further complicated by the fact that the analyses involved used different dependent variables (Rosenthal & Rubin, 1986). It is widely recognized that different dependent measures may have different reliabilities and sensitivities to change (Edwards et al., 1984; Lambert, Hatch, Kingston, & Edwards, 1986) and may therefore lead to different conclusions about the efficacy of the various therapies under investigation. For example, it has been shown (Lambert et al., 1986) that the Hamilton Rating Scale for Depression (Hamilton, 1960), which is an interviewer-based assessment instrument, is significantly more likely to show changes in depression level than either the Zung Self-Rating Scale (Zung, 1965) or the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). On the basis of these results, the BDI is a more conservative measure of change in depressive symptomatology.

The purpose of the present study was to review in a meta-analytic format the results for a specific form of therapy for depression and with a single, well-established outcome measure. The cognitive therapy of depression developed by Beck and his associates (Beck, 1976; Beck, Rush, Shaw, & Emery, 1979) is a specific type of the broad class of therapies called *cognitive-behavioral* (Dobson & Block, 1988). Cognitive therapy has certainly attracted wide attention as an effective short-term therapy modality for clinical depression. Reviews of the success of cognitive therapy (deRubeis & Beck, 1988; Williams, 1984) have supported its efficacy, even while expressing caution regarding its relative utility compared with other therapeutic methods. Williams (1984), for example, argued that many of the comparisons between cognitive therapy and pharmacotherapy have been biased in favor of the cognitive approach by virtue of the time constraints of treatment research, the difficulties imposed by having therapists blind to drug condition, and limited access to medications (usually one drug was chosen for each study on an a priori basis, and therapists were not able to alter the drug they administered to patients who did not respond).

Aside from limited reviews of the effects of cognitive therapy of depression, there have been no comprehensive reviews of the comparative effectiveness of this approach. For the purposes of the current study, an exhaustive review was made of all studies from January 1976 to December 1987 either previously known to the author or appearing in any of the major journals listed in the clinical psychology *Psychscan* published by the American Psychological Association.[1] To qualify, the study had to involve

This article is based on a paper presented at the annual meeting of the Canadian Psychological Association, Toronto, June 1986. Thanks are extended to Brenda Partlo, who assisted in the data collection, and Liz McCririck, who aided the manuscript production.

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[1] The journals included in this review were the *American Journal of Orthopsychiatry*, the *American Journal of Psychiatry*, the *American Journal of Psychotherapy*, the *Archives of General Psychiatry*, *Behavior Therapy*, *Behaviour Research and Therapy*, the *British Journal of Clinical Psychology*, *Clinical Psychologist*, the *Clinical Psychology Review*, *Cognitive Therapy and Research*, the *Journal of Abnormal Psychology*, the *Journal of Behavioral Medicine*, the *Journal of Clinical Child Psychology*, the *Journal of Clinical and Experimental Neuropsychology*, the *Journal of Clinical Psychology*, the *Journal of Consulting and Clinical Psychology*, the *Journal of Counseling Psychology*, the *Journal of Nervous and Mental Disease*, the *Journal of Personality Assessment*, *Profes-*

a specific analysis of the efficacy of cognitive therapy, and its description had to either explicitly reference the treatment manual prepared by Beck and his colleagues (*The Cognitive Therapy of Depression,* Beck et al., 1979) or involve the treatment procedures of cognitive therapy, with explicit reference to the work of Beck. In addition to these criteria, the study had to target depression as the focal problem of treatment and use as an outcome measure the BDI (Beck et al., 1961; for a discussion, see Nietzel, Russell, Hemmings, & Gretter, 1987). Thus the present meta-analysis included those studies since 1976 that analyzed the effects of cognitive therapy of depression using the BDI as a measure of therapeutic change.

Method

A total of 28 studies were identified that fulfilled the twofold criteria of analyzing the effect of the cognitive therapy on depressed clients and using the BDI as an outcome measure. Table 1 lists these studies and presents the relevant statistics for completed subjects. On the basis of these studies, a total of 39 contrasts with behavior therapy, pharmacotherapy, another psychotherapy, or a control condition was possible. Several of the studies used a pre–post-only design for the effects of cognitive therapy, and several failed to report means, standard deviations, or appropriate test statistics to enable the relevant meta-analytic computations (Bangert-Drowns, 1986; Glass, McGaw, & Smith, 1981; Smith, Glass, & Miller, 1980).

The computations were those typical of other meta-analyses (e.g., Glass et al., 1981; Steinbrueck et al., 1983). The primary analyses consisted of the computation of effect sizes as originally outlined by Cohen (1977). Effect sizes were computed as the mean of the criterion group—in this case the cognitive therapy group—minus the mean of the contrast group, divided by the standard deviation of the contrast group. Conceptually, the effect sizes reflect the distance the average cognitive therapy client was from the average contrast client, expressed in standard deviation units. Thus, an effect size of −1.00 would indicate that the average cognitive therapy client would have been 1 standard deviation unit lower on the BDI than the contrast group. Effect sizes approximating zero would indicate no differential advantage for either therapy, and positive effect sizes would suggest that cognitive therapy was in fact less effective than the contrast. In addition to the computation of effect sizes, the length of therapy and the age of the samples were recorded, when reported, and treatment changes were correlated with these variables.

Results

Cognitive Therapy Versus Other Conditions

Ten studies provided data comparing a cognitive therapy group to either a no-treatment or a wait-list control. The mean effect size for these studies was −2.15 (range = −0.58 to −7.24), indicating that the average cognitive therapy client did better than 98% of the control subjects. This result is highly consistent with the results of Nietzel et al.'s (1987) recent meta-analysis of various types of psychotherapy for depression.

Nine studies contrasted cognitive and behavioral therapies, and the mean effect size was −0.46 (range = 0.33 to −1.03). On the basis of these data, the average cognitive therapy client had an outcome superior to that of 67% of the behavior therapy clients.

Of the eight studies that permitted contrasts between cognitive therapy and pharmacotherapy, the mean effect size was −0.53 (range = 0.42 to −1.74). This finding suggests that cognitive therapy clients, on average, did better than 70% of drug therapy patients. These results coincide with those of Miller and Berman (1983), who stated, "Although the small number of studies suggests caution, the evidence to date indicates cognitive behavior therapies to be at least as effective as drug treatment for depressed patients" (p. 47). The current meta-analysis involved five additional studies not cited by Miller and Berman and may be taken as incremental evidence that their former tentative conclusion still holds. It is also worth noting that in their study Miller and Berman analyzed generic cognitive–behavioral therapies (cf. Dobson & Block, 1988), whereas the current study analyzed the specific effects of Beck's cognitive therapy.

Seven studies compared the efficacy of cognitive therapy and a number of other approaches not included in the analyses described above. The mean effect size was −0.54 (range = 0.32 to −0.90), revealing that the average cognitive therapy client did better than 70% of the other psychotherapy clients.

Other Variables and Therapeutic Effects

In addition to simply contrasting the outcomes of various therapies and cognitive therapy, I examined the influence of three other variables on effect sizes.[2] These variables were the length of therapy, the proportion of women in the study, and the age of the clientele. For each study in which these variables were provided or could be estimated, they were correlated with the difference between the posttest scores and the pretest scores on the BDI for the cognitive therapy condition. This analysis thus provided an estimate of the amount of depression change in the cognitive therapy condition and possible mediators of that change.

On the basis of these analyses, the correlation between depression change and length of therapy was −.28 ($df = 25$, $p =$ *ns*). Thus, it appears that the number of weeks of treatment did not relate to the amount of change seen in cognitive therapy. Similarly, the correlation between the proportion of women in the study and the amount of BDI change was nonsignificant, $r(22) = .30$, $p =$ *ns*. It is notable that most of the studies had a preponderance of female subjects, roughly three women to one man ($M = 0.74$, range = 0.50–1.00). The correlation between the amount of change and age of the clientele was −.54 ($df = 20$, $p < .01$). This suggests that there is a trend for younger clients to improve more with cognitive therapy. It is important to note that of the 22 studies that reported ages on their subjects, 14

sional Psychology: Research and Practice, the *Psychological Bulletin,* and *Psychotherapy.*

[2] As others have noted, publications are not systematic in their report of various factors that might mediate therapy change (Nietzel et al., 1987). The variables chosen for use in this study were those that were more consistently reported, and although other variables may be correlated with change (e.g., therapist competence and level of training), the lack of clear and consistent reporting of these aspects made such analyses impossible. Even the variable of age was reported in only 21 of the 28 studies reviewed, and in 12 of those 21 studies the age data were for the entire sample of patients. Only 9 of the studies reported the averages for each treatment group.

Table 1
List of Studies Included in the Meta-Analysis

Author	Year	Sample[a]	Therapy[b]	Cell size	Weeks of therapy	Average age[c]
1. Baker & Wilson	1985	Community	Cognitive—no booster	9	7	39.5
			Cognitive—booster	9	7	
			Cognitive—cognitive booster	10	7	
2. Beck, Hollon, Young, & Bedrosian	1985	Clinic	Cognitive	18	11.6	34.7
			Cognitive & drugs	15	12.4	39.5
3. Beach & O'Leary	1985	Clinic	Cognitive	3	14	33.0
			Behavioral marital	3	14	
			Waiting list	2	14	
4. Blackburn, Bishop, Glen, Whalley, & Christie	1981	Hospital	Cognitive	22	12.4	39.2
Blackburn, Enuson, & Bishop	1985		Pharmacotherapy	20	12.5	47.9
			Combination	22	13.7	44.1
5. Comas-Diaz	1981	Clinic (Puerto Rican)	Cognitive	8	6	38.0
			Behavioral	8	6	
			Waiting list	10	4	
6. Dunn	1979	Psychiatric	Cognitive	10	8	—
			Medication & support	10	8	
7. Elkin, Parloff, Hadley, & Autry	1985	Clinic	Cognitive	37	16	34.0
Elkin et al.	1986					
Elkin et al.	1988		Interpersonal	47	16	35.8
			Drug	36	16	35.0
			Placebo	35	16	36.2
8. Fennell & Teasdale	1982	Drug refractory	Cognitive	5	16	39.0
9. Gallagher & Thompson	1982	Geriatric	Cognitive	10	12	68.3
Gallagher & Thompson	1983		Behavioral	10	12	66.0
			Insight psychotherapy	10	12	69.0
10. Hollon, Evans, & deRubeis	1983	Hospital	Cognitive	16	12	32.9
			Drug	16	12	38.6
			Drug & support	16	12	31.7
			Combination	16	12	34.8
11. Keller	1983	Volunteer	Cognitive—low DAS	9	4	32.0
			Cognitive—high DAS	9	4	
12. LaPointe & Rimm	1980	Female	Cognitive	12	6	35.1
			Assertiveness training	10	6	
			Insight-oriented group	11	6	
13. McLean & Hakstian	1979	Hospital	Cognitive-behavioral	44	10	—
			Psychotherapy	51	10	
			Relaxation	48	10	
			Drug (amitryptiline)	53	11	
			Normal controls	55	—	
14. Murphy, Simons, Wetzel, & Lustman	1984	Clinic	Cognitive	19	12	32.4
Simons, Murphy, Levine, & Wetzel	1984		Drug (tricyclics)	16	12	34.7
			Cognitive & drug	18	12	35.8
			Cognitive & placebo	17	12	32.6
15. Rush, Beck, Kovacs, & Hollon	1977	Clinic	Cognitive	19	10.9	
Kovacs, Rush, Beck, & Hollon	1981		Drug (imipramine)	22	10.9	
16. Shapiro, Sank, Shaffer, & Donovan	1982	Clinic	Cognitive (group)	10	10	
Shaffer, Shapiro, Sank, & Coghlan	1981		Interpersonal process	13	10	
			Cognitive (individual)	12	10	
17. Shaw	1977	Student	Cognitive	8	8	19.8
			Behavioral	8	8	20.1
			Nondirective	8	8	20.5
			Waiting list	8	8	19.9
18. Steuer & Hammen	1983	Geriatric	Cognitive	4	36	70.6
19. Steuer et al.	1984	Geriatric	Cognitive	26	37.5	66.0
			Psychodynamic	27	37.5	
20. Taylor & Marshall	1977	Student	Cognitive	7	6	—
			Behavioral	7	6	
			Cognitive-behavioral	7	6	
			Waiting list	7	4	

Table 1 (*continued*)

Author	Year	Sample[a]	Therapy[b]	Cell size	Weeks of therapy	Average age[c]
21. Wilson, Goldin, & Charbonneau-Powis	1983	Clinic	Cognitive	8	8	39.5
			Behavioral	8	8	
			Waiting list	9	8	
22. Reynolds & Coates	1986	Adolescent	Cognitive–behavioral	9	5	15.6
			Relaxation training	11	5	
			Waiting list	10	5	
23. McNamara & Horan	1986	University	Cognitive	10	8	23
			Behavioral	10	8	
			Cognitive–behavioral	10	10	
			High-demand controls	10	8	
24. Jarrett & Nelson	1987	Community	Cognitive (two orders)	37	12	37
25. Teasdale, Fennell, Hibbert, & Amies	1984	Community	Therapy as usual (TAU)	14	4	37
Fennell & Teasdale	1987		Cognitive & TAU	17	15.2	38
26. Wierzbicki & Bartlett	1987	Community	Group cognitive	9	6	—
			Individual cognitive	9	6	
			Waiting list	20	6	
27. Beutler et al.	1987	Geriatric	Alprazolam & support	12	20	70.7
			Placebo & support	15	20	
			Cognitive & placebo	16	20	
			Cognitive & alprazolam	13	20	
28. Thompson, Gallagher, & Breckenridge	1987	Geriatric	Behavioral	25	20	66.9
			Cognitive	27	20	67.1
			Psychodynamic	24	20	66.7
			Delayed treatment	19	6	67.6

[a] All samples were outpatient.
[b] Therapy labels reflect those used by each study's authors.
[c] For each cell, when available. A single age indicates that this was the age stated for the entire study sample. Dashes indicate that no age data were reported.

had an average age between 32.0 and 39.5 years. Three studies had younger samples and five had geriatric samples. These geriatric samples, in particular, may have biased the results because three of these studies had subjects who were relatively less depressed at pretest, and the length of treatment in two of these studies was more than double that of the next longest length of treatment. Their inclusion, therefore, must be questioned. Recomputation of the correlation without these groups altered the correlation between age and BDI change to $-.24$ ($df = 15$, $p = ns$), which does not achieve statistical significance.

Discussion

On the basis of the results presented here, it appears to be a reliable conclusion that, as assessed by changes in the BDI, cognitive therapy is more effective than nothing at all, behavior therapy, or pharmacotherapy in the treatment of clinical depression. It also appears that cognitive therapy is superior to other forms of psychotherapy in the treatment of depression. Further contrasts with other specific forms of therapy are clearly needed to permit better discussion of this last point, however, because the contrast psychotherapies in the current analyses were quite varied.

In addition, it appears that cognitive therapy has its effect independent of the length of therapy. Because the average length of therapy in the studies was only 14.9 weeks ($SD = 9.5$), it appears that cognitive therapy may have a relatively rapid effect on changing depressive self-report. Likewise, it appears that the sex ratio of subjects does not mediate the effectiveness of cognitive therapy, implying that cognitive therapy is equally effective for both sexes. Research specifically examining sex differences in response to cognitive therapy is needed, because most studies to date have emphasized women. This meta-analysis is not definitive with respect to the relation of age and outcome in cognitive therapy. Although the absolute correlation between BDI change and age was significant, the small number of geriatric studies clearly limits the strength of any conclusions that might be drawn. Further research is needed to assess the efficacy of cognitive therapy across different age groups, particularly with elderly depression samples.

It is important to note that although the results of this meta-analysis certainly provide reason for encouragement and further application of cognitive therapy, several aspects of cognitive therapy are not well researched or understood. For example, the cognitive model of depression (Beck, 1976; Beck et al., 1979) implicates both situation-specific cognitive distortions and more stable "depressogenic" assumptions. It is not clear, however, to what extent the process of cognitive therapy achieves change in either of these types of depressive thinking or to what extent cognitive therapy achieves its therapeutic outcomes through the specific modification of either cognitive distortions or depressogenic assumptions. The process of change affiliated with the changes in depression level requires further investigation. One area requiring specific attention is the extent to which

behavioral and cognitive change aspects of the therapy lead to the effects of cognitive therapy. This research is germane particularly because of the relative emphasis on behavioral interventions early in the treatment of depression (Beck et al., 1979) and the observation that cognitive therapy has its effects independent of length of treatment.

An important limitation of the current study is that it selectively reviewed certain data related to the outcome of cognitive therapy. The effect sizes reported in this study were all computed using pretest and posttest scores on the BDI for clients who completed therapy. Data for clients who dropped out of therapy were not incorporated in those analyses (these data are often not reported, in any event). Such exclusions may have affected the conclusions drawn by this meta-analysis in some undetermined fashion.

Follow-up data were not incorporated into the present meta-analysis. Although these data are more frequently reported in outcome studies (19 of the 28 studies identified for this review reported follow-up data), the interpretation of effect sizes for these data is highly problematic for two reasons. First, the time interval from the posttest to the follow-up assessment is highly variable, thus confounding effect sizes with duration of follow-up. Second, and more serious, because some clients relapse during the follow-up phase, the effect sizes may be eroded or enhanced depending on how the data for these clients are handled. If the data for clients who drop out, for example, are excluded from the follow-up, then the remaining subjects are likely to have lower depression scores. It is possible, therefore, to have a comparison of one study in which one group of clients had some degree of depression but no actual relapse with another study that had several relapsed clients, but the clients who were tested at the follow-up assessment were all clearly nondepressed. Effect sizes based on these data would actually favor the group with more clients who relapsed, rendering such analyses meaningless. For these reasons, effect sizes for the follow-up data are not reported here, even though within specific studies there were reports of a follow-up advantage for cognitive therapy (e.g., Simons, Murphy, Levine, & Wetzel, 1984).

Finally, it is important to note that cognitive therapy should not be accepted as a psychotherapeutic panacea for depression. It is likely that some clients may not be appropriate for this form of therapy and may in fact benefit more from alternative interventions. For example, it has been argued that depressed geriatric patients are better candidates for pharmacotherapy, because the nature of their symptomatology is often characterized by the so-called vegetative, or physical, signs (Bielski & Friedel, 1976). The results presented in this meta-analysis are equivocal with respect to the utility of cognitive therapy for the elderly, but this issue demands the future attention of investigators (cf. Gallagher & Thompson, 1983). Further, the general question of matching patient characteristics to therapeutic models should be investigated within the cognitive therapy approach (Dobson & Shaw, 1988). For example, it has been argued that marital status and the quality of the marital relationship may be moderators of the effectiveness of cognitive therapy (Dobson, Jacobson, & Victor, 1988), and this and other potential moderators should be assessed with respect to the effectiveness of cognitive therapy. With the establishment of a highly effective form of therapy, researchers can begin to address the question of who it will and will not benefit.

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Received August 4, 1986
Revision received October 27, 1988
Accepted November 23, 1988 ■