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Efficacy of Dialectical Behavior Therapy in Women Veterans With Borderline Personality Disorder

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Twenty women veterans who met criteria for borderline personality disorder (BPD) were randomly assigned to Dialectical Behavior Therapy (DBT) or to treatment as usual (TAU) for 6 months. Compared with patients in TAU, those in DBT reported significantly greater decreases in suicidal ideation, hopelessness, depression, and anger expression. In addition, only patients in DBT demonstrated significant decreases in number of parasuicidal acts, anger experienced but not expressed, and dissociation, and a strong trend on number of hospitalizations, although treatment group differences were not statistically significant on these variables. Patients in both conditions reported significant decreases in depressive symptoms and in number of BPD criterion behavior patterns, but no decrease in anxiety. Results of this pilot study suggest that DBT can be provided effectively independent of the treatment's developer, and that larger efficacy and effectiveness studies are warranted.

Until very recently, there was only one published randomized clinical trial of a psychosocial treatment for persons with borderline personality disorder (BPD), namely the report by Linehan, Armstrong, Suarez, Allmon, and Heard (1991) on dialectical behavior therapy (DBT), summarized below. The need for replication of the treatment's efficacy at an independent site provided the primary impetus for the present study. Since our study was conducted, Bateman and Fonagy (1999) have reported significantly more favorable outcomes for patients diagnosed with BPD who were randomly assigned to a long-term, psychodynamically oriented partial hospital program (average length of stay = 1.45 years) than for those randomly assigned to standard outpatient treatment that included no psychotherapy. It is certainly fortunate for patients and intriguing for researchers that there now appear to be two treatments for BPD with some demonstrated efficacy.

DBT was developed initially by Marsha Linehan (Linehan, 1993a, 1993b), specifically for the treatment of chronically suicidal and self-injurious women. Most of these women meet criteria for BPD. About 75% of those diagnosed with BPD are female, and chronic suicidal behavior is a common feature (Widiger & Frances, 1987).

Linehan et al. (1991) randomly assigned 44 parasuicidal women diagnosed with BPD to 1 year of DBT or to treatment-as-usual (TAU) in the community. Women receiving DBT had significantly greater reductions in self-harm behaviors (including suicide attempts), in the medical risk of those behaviors, and in the frequency of psychiatric hospitalizations and lengths of stay, and lower treatment dropout rates than women receiving TAU. DBT also showed superior efficacy in reducing trait anger and improving Global Assessment Scale scores and both interviewer-rated and self-rated social adjustment (Linehan, Tutek, Heard, & Armstrong, 1994). On questionnaire measures of depression, hopelessness, reasons for living, and suicidal ideation, however, although patients in both conditions showed significant improvement during the 12 months of treatment, the treatment conditions did not significantly differ (Linehan et al., 1991). Improved symptoms and functioning of patients were generally maintained at 6- and 12-month follow-up (Linehan, Heard, & Armstrong, 1993).

DBT has generated considerable interest since the Linehan et al. (1991)

report, and was the subject of a recent critical review (Scheel, 2000) and accompanying series of commentaries. DBT principles and strategies increasingly are being used in a wide variety of clinical settings, perhaps, as Swenson (2000) has noted, not only because there has been no other treatment with any documented efficacy, but also because clinicians and clinical administrators may find numerous aspects of the treatment's principles and strategies very appealing.

DBT also has been adapted for use with a variety of populations other than suicidal borderline women. A few nonrandomized controlled studies have been conducted with these populations (Rathus & Miller, 1999, with suicidal adolescents; Telch, Agras, & Linehan, 1999, with binge eaters), and some randomized trials are in progress or recently completed (Linehan, Dimeff, Comtois, Kivlahan, & McDavid, 1999, with BPD and opiate dependence; Linehan et al., 1999, with BPD and drug dependence; Lynch et al., 1999, with depressed elderly; and van den Bosch, 1999, with alcohol/drug dependence with or without BPD), but none are yet published.

Linehan and her colleagues are conducting a more rigorously controlled trial in which preliminary results so far again support the relative efficacy of DBT for suicidal borderline women (Linehan et al., 1998). However, as Scheel (2000) points out, conclusions about DBT's efficacy currently rest primarily on only one published randomized study (Linehan et al., 1991; Linehan et al., 1993; Linehan, Tutek, et al., 1994) conducted by the treatment's developer and "replication is clearly needed to ensure that initial results are reliable" (p. 80). Indeed, criteria designating a treatment as well-established adopted by the APA Division 12 Task Force on Promotion and Dissemination of Psychological Procedures require an independent demonstration of efficacy in a randomized trial (Chambless et al., 1996). DBT is the only treatment currently listed as "probably efficacious" for BPD, and no treatments are listed as "well-established."

We report results of the first randomized controlled trial of DBT conducted outside of its site of development. It was designed as a pilot study with a relatively small sample, with the goals of determining whether our research therapists could conduct DBT with adequate adherence and whether outcomes would be superior to those of usual care in the same setting and system.

Just as in Linehan et al. (1991), we compared DBT to TAU. Comparison with another standardized treatment would provide a stronger test of specific efficacy, but no such treatment manual was available, and TAU provides a useful, clinically meaningful comparison. TAU was somewhat more standardized in our study than in other randomized controlled trials of psychodynamic or cognitive behavioral treatments for BPD (Bateman & Fonagy, 1999; Linehan et al., 1991) or for recurrent suicidal or self-injurious behavior (Evans et al., 1999; Salkovskis, Atha, & Storer, 1990) in that all patients received their treatment in the same system (the local VA) and efforts were successfully made to ensure that all patients referred to TAU actually began treatment.

Because in our study recent parasuicide was not a criterion for study entry,

we expected our sample to have less current parasuicidal behavior than the sample of Linehan et al. (1991), and hypothesized that DBT would be associated with significant reductions in a broader range of symptoms. Because of its focus on distress tolerance skills, we predicted significant declines in both parasuicidal behavior and suicidal ideation. Because DBT links behavioral change to specific goals and focuses on developing a "life worth living," we predicted that it would reduce hopelessness. In addition, we predicted that the focus on developing and using emotion regulation and interpersonal effectiveness skills, together with the targeted problem-solving approach, would significantly reduce depression, anxiety, anger, and dissociation. We predicted that patients in DBT would change significantly more on these variables than patients in TAU. We also assessed whether patients in either treatment changed in diagnostic status following treatment, as recommended by Turner (2000).

Method

Participants

Participants were recruited primarily through the Women Veterans Comprehensive Health Center, a primary care clinic in the Durham VA Medical Center that also offers mental health services to all honorably discharged women veterans in the state of North Carolina. Additional recruitment was conducted at the Veterans Readjustment Counseling Centers and at other VA medical centers in the state. Included in the study were women veterans who met *DSM-III-R* criteria[1] for BPD (American Psychiatric Association, 1987). Exclusion criteria included schizophrenia, bipolar disorder, substance dependence, and antisocial personality disorder.

Fifty-six potential participants who were seeking mental health treatment were referred to the study. Based on an initial screening, 14 were excluded because of the inclusion and exclusion criteria, 5 were unwilling to participate, and 4 lacked access to dependable transportation resources. The remaining 33 were given a full evaluation. Two of these 33 did not meet criteria for BPD, and 3 met criteria for one of the excluding diagnoses. The remaining 28 women were randomized to treatment.

Two did not attend the first appointment. Another woman dropped out after the first appointment when she realized she would only be paid for assessments, not for attending treatment. Two participants in TAU and 3 in DBT dropped out of treatment after attending more than one appointment, all in

[1] Although *DSM-IV* was published in 1994, the final *DSM-IV* version of the SCID-II was not yet available when this study began, in early 1996, so we used the *DSM-III-R* version. The criteria for BPD are almost identical, except that *DSM-IV* added one criterion (transient, stress-related paranoid ideation or severe dissociative symptoms), and the threshold for diagnosis became 5 out of 9 instead of 5 out of 8 criteria. It is almost certain, therefore, that all of our participants would also have met *DSM-IV* criteria, and some would have scored higher on total number of criteria met.

the first half of treatment, citing loss of transportation and distance from the medical center as reasons. Twenty participants, 10 in each condition, completed treatment. Participants were paid $20 for each of three assessments: the pretreatment evaluation, an assessment at midtreatment (3 months) and at posttreatment (6 months).

Participants' mean age was 35 (range: 21 to 46). Fifty-five percent lived with a partner. Seventy-five percent were Caucasian and 25% were African American. Seventy percent had incomes under $20,000 per year. Eighty percent had completed some college, but only 20% had a bachelor's degree or equivalent. Seventy-five percent had a lifetime history of parasuicide, defined as any intentional self-injury, from the most superficial to the most severe, including suicide attempts, and 40% reported parasuicidal behavior in the 6 months prior to the study. Fifty-five percent had at least one lifetime psychiatric admission and 25% had an inpatient psychiatric admission in the last 6 months. All had at least one psychiatric outpatient visit in the previous 6 months. Twenty-five percent met criteria for substance abuse, but not dependence. On the Trauma Questionnaire (McIntyre et al., 1999), 60% reported sexual abuse before age 13, 65% reported being battered by a partner, and 85% reported being raped as an adult, 46% while on active military duty. Descriptive statistics on continuous measures of clinical characteristics at pretreatment are shown in Table 1. None of the variables shown in Table 1 or discussed above differed significantly between groups.

Screening and Evaluation Procedure

Potential participants were screened in person by semistructured interview. Those who seemed likely to meet criteria for BPD, had access to transportation, and were willing to attend weekly appointments were scheduled for a complete initial assessment.

At the assessment, potential participants were interviewed using the BPD and antisocial personality disorder sections of the Structured Clinical Inter-

TABLE 1
DESCRIPTIVE DATA ON DBT AND TAU GROUPS AT PRETREATMENT

Variable	DBT Median	DBT Mean	DBT *SD*	TAU Median	TAU Mean	TAU *SD*
Age	35.5	34.5	7.5	38.5	35.4	6.9
BPD criteria	7.0	6.8	1.1	7.0	6.7	0.8
Hospitalizations, lifetime	0.5	1.1	1.7	1.5	7.4	18.6
Hospitalizations, past 6 months	0.0	0.5	1.0	0.0	0.3	0.7
Inpatient days, past 6 months	0.0	26.7	60.6	0.0	2.4	5.6
Parasuicides, lifetime	9.5	157.2	323.3	4.0	15.8	30.7
Parasuicides, past 6 months	0.5	10.2	26.4	0.0	1.3	2.6

Note. Groups did not differ significantly at pretreatment on any of these variables.

view for *DSM-III-R* for Axis II (SCID-II; Spitzer, Williams, Gibbon, & First, 1990), and the substance abuse, bipolar disorder, and schizophrenia sections of the Structured Clinical Interview for *DSM-III-R* for Axis I (SCID-I; Spitzer, Williams, Gibbon, & First, 1989). They also were interviewed regarding parasuicidal behavior, anxiety symptoms, depressive symptoms, and treatment history, and were administered questionnaire measures of suicidal ideation, hopelessness, depression, anger, and dissociation, as well as several personality measures not relevant to this report. Assessment interviews were conducted by two psychology interns who were previously trained to reliability of .80 or greater with each other and with the VAMC PTSD clinic psychologist (Dr. Jean Beckham) on the SCID-I and SCID-II and were unaware of subjects' treatment condition.

Treatments

Individual psychotherapy was provided at the Durham VA Medical Center for 19 participants and at the Veterans Readjustment and Counseling Center in one case. All participants were offered pharmacotherapy at the VA Medical Center, provided by an attending psychiatrist or by a resident in psychiatry supervised by an attending psychiatrist. Pharmacotherapy and psychotherapy were provided by separate clinicians in all but one TAU case, and all participants, except one in the DBT condition, received pharmacotherapy. In every case, this included an SSRI, and, for some participants, also included a mood stabilizer and/or low-dose neuroleptic.

DBT. DBT was developed initially for the treatment of chronically suicidal or self-injurious patients and is described in detail in a published book and treatment manual (Linehan, 1993a, 1993b). The primary dialectic upon which the treatment rests is the balance and synthesis of acceptance of the patient as she is currently, using validation strategies, with the attempt to get the patient to change, using behavior therapy strategies. DBT includes individual therapy, a separate group skills training, and a therapists' consultation meeting, all attended weekly. In this study, the treatment period was shortened from the 1-year treatment of Linehan et al. (1991) to 6 months. Linehan et al. reported significant improvement by 4 months of treatment. The length of the skills training group and the therapist consultation meeting were also shortened to 90 minutes per week each.

DBT individual therapy is structured by a hierarchy of targeted behaviors, monitored by the patient on a diary card and discussed in session in order of priority. The highest priority behaviors are suicidal, parasuicidal, or other life-threatening behaviors. Second are behaviors interfering with therapy, such as nonattendance, noncompliance, or excessive anger directed at the therapist. Third in priority are other behaviors that importantly interfere with quality of life, such as not seeking treatment for a medical problem, continually being late or absent from work, or engaging in excessive or protracted conflict with a spouse or significant other. These behaviors are addressed by behavioral analyses and solution analyses based on the use of DBT skills to

replace maladaptive behaviors. Skills training group functions as a class, teaching skills for identifying and regulating emotions, tolerating distress, interacting with others more effectively, and living more mindfully. Individual therapists are available between sessions for telephone coaching in use of skills to reduce targeted behaviors. The therapists' consultation meeting functions to support the clinicians' efforts to provide competent treatment that adheres to DBT theory and practice.

Clinicians providing individual DBT included a psychiatrist, two psychologists, a clinical social worker, and a clinical nurse specialist in psychiatry (the first five authors). Skills training groups were co-led by the clinical nurse specialist and one of two psychiatry residents. The DBT clinicians, four women and three men, had a mean of 8.2 years of clinical experience. All except one resident had attended intensive training in DBT (10 days plus 6 months practice and homework), given by Linehan and her associates. All attended the weekly consultation group, and several received additional individual supervision from each other. Two clinicians received supervision briefly from a senior trainer from Linehan's group.

All individual and group sessions were videotaped for later coding for adherence using the DBT Expert Rating Scale (Linehan, Lockard, Wagner, & Tutek, 1996). Currently being revised, this is an ordinal scale from 0 to 5.0, with an average score over sessions of 3.8 and above indicating adherence. Interrater reliability between Linehan and the coder of the present study was .80 for a separate sample of 68 videotaped therapy sessions (M. M. Linehan, personal communication, April 1998). At the end of treatment, a sample of eight tapes from each therapist-patient dyad, including the first session and seven others selected randomly, was coded for adherence. The mean score for all tapes was 3.8, the cutoff recommended by Linehan as indicating adherence. Of the 10 therapist-patient dyads, 5 had mean adherence scores of 3.8 or above and the other 5 were below 3.8. The range of mean adherence scores was 3.2 to 4.2.

TAU. Participants in the control group were offered 60 minutes of weekly individual therapy with a clinician in the VA. This quantity and frequency of individual treatment was at or above the usual standard of care for veteran women in this VA medical center. All TAU participants were also offered one or more of several supportive and psychoeducational groups, which they could attend either in the Women's Health Center, elsewhere in the VA medical center, or at the Veterans Readjustment and Counseling Center. Four TAU participants regularly participated in one or more group treatments.

There were eight TAU clinicians: five women and three men. All were employed by the Durham VAMC or the Raleigh Veterans Readjustment Counseling Center and all volunteered to participate. They included three psychologists, two resident psychiatrists, two clinical social workers, and a clinical nurse specialist in psychiatry. They had a mean of 10.6 years of clinical experience. TAU clinicians agreed to use whatever therapeutic orientation they would ordinarily follow with a patient with this disorder. None had

received training specifically in DBT. Of the TAU clinicians, four described themselves as cognitive-behavioral in their primary orientation, two as psychodynamic, and two as eclectic. Five clinicians, including three who were not trainees, received weekly supervision on their cases from attending psychiatrists or staff psychologists. TAU clinicians did not meet as a group with one another, although all were part of regular multidisciplinary treatment teams in various areas of the medical center.

Measures

Outcome measures were given at baseline and after 3 months and 6 months of treatment. We chose to focus on behaviors that not only are common among individuals with BPD (reflected in diagnostic criteria) but also behaviors for which standardized measures are available. Thus, we did not comprehensively assess intense, unstable relationships, fear of abandonment, feelings of emptiness, or unstable sense of self, although these were assessed as part of the SCID-II interviews. Instead, we focused on parasuicidal behaviors, suicidal ideation and hopelessness, mood and emotion measures (depression, anxiety, and anger), and cognitive disturbance under stress (dissociation). Like Linehan et al. (1991), we also assessed rates of psychiatric inpatient admissions, as this is clearly an important index for this population.

Parasuicidal behavior. Participants were given the Parasuicide History Interview (Linehan, Heard, & Wagner, 1994), which assesses the frequency, nature, intent, medical severity, precipitating factors, and outcomes of all parasuicidal behaviors, including suicide attempts, during a specified time period. Because only about half of an already small sample had any recent parasuicide at pretreatment, we focused only on frequency.

Suicidal ideation and hopelessness. Suicidal ideation and hopelessness were assessed with a self-report form of the Beck Scale for Suicide Ideation (Schotte & Clum, 1982) and the Beck Hopelessness Scale (Beck, Weissman, Lester, & Trexler, 1974), which have been validated and widely used. As a clinical interview in 90 inpatients with suicidal ideation, the reliability of the Beck Scale for Suicide Ideation (SSI) was 0.89 and interrater reliability was 0.83 (Beck, Kovacs, & Weissman, 1979). A self-report adaptation of the SSI correlated highly ($r = 0.90$) with the interview version in a sample of 65 undergraduates reporting suicidal ideation (Schotte & Clum). The internal consistency of the Beck Hopelessness Scale (BHS) is high ($\alpha = 0.93$) and correlations with clinical ratings and other tests measuring negative attitudes about the future are also high (in a general practice sample, $r = 0.74$; in a sample of suicide attempters, $r = 0.62$; Beck et al., 1974).

Mood and emotion measures. We used validated and frequently used measures of depression, anxiety, and anger. Depression was measured by self-report on the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) and by interview on the 25-item version of the Hamilton Depression Rating Scale (HAM-D; Hamilton, 1960). The internal consistency of the BDI in a variety of psychiatric populations ranges from

$\alpha = 0.76$ to $\alpha = 0.95$, with an average coefficient alpha of 0.86. The test-retest correlations in various psychiatric samples range from 0.48 to 0.86 over a period ranging from 5 days to 1 month. In addition, the BDI reflects the hierarchy in depressive severity implemented in the *DSM* (Schotte, Maes, Cluydts, DeDoncker, & Cosyns, 1997). In an inpatient psychiatric sample, the HAM-D has an interviewer-observed intraclass correlation of 0.91, with coefficients of reliability for individual items ranging from 0.40 to 0.97 (Endicott, Cohen, Nee, Fleiss, & Sarantakos, 1981).

Anxiety was measured by interview on the Hamilton Anxiety Rating Scale (HARS; Hamilton, 1959). The average weighted correlation between pairs of psychiatrist ratings of 35 patients on the HARS was 0.89 (Hamilton).

Anger was assessed using the Spielberger Anger Expression Scale (Spielberger, Jacobs, Russell, & Crane, 1985). In a very large community sample, the internal reliability for each of the two scales was 0.73 for Anger Out and 0.70 for Anger In (Knight, Chisholm, Pauling, & Waal-Manning, 1988). We analyzed separately the Anger In subscale, which assesses anger experienced but not directly expressed, and the Anger Out subscale, which assesses direct verbal and nonverbal expression of anger.

Dissociation. A widely used questionnaire, the Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986) was employed to measure dissociation, which, like parasuicide, we conceptualized as a maladaptive emotion-regulation strategy, and which is included among the *DSM-IV* criteria for BPD. The DES has test-retest correlations ranging from 0.79 to 0.96 for 4- to 8-week periods. Its internal reliability in terms of split-half correlation ranges from 0.83 to 0.93. The reported internal consistency is high ($\alpha = 0.95$).

Health care utilization. Data on number of psychiatric inpatient admissions, length of stay, and contact time with outpatient providers were obtained from the Decentralized Hospital Computer Program, a computerized record of region-wide VA visits and phone contacts. The Treatment History Interview (Linehan, 1987b) conducted with the patient provided some of the same information, as well as information about non-VA health care utilization. Additional data on health care utilization were obtained from the Therapist Interview (Linehan, 1987a) conducted with the therapist.

Data Analysis

We first examined the distributions of all variables and adopted the rule that if skewness was greater than 2.0 and/or kurtosis greater than 7.0, transformations that might produce a normal distribution would first be conducted. Next, we compared the two treatment groups by *t* tests on all outcome measures at pretreatment, as well as on the lifetime clinical and demographic variables shown in Table 1. If any variable significantly differed between groups, we then determined whether it predicted change on any of the outcome measures. No such confound effects were found.

In order to determine whether the two treatment conditions differed in amount of change over the course of treatment on each continuous variable,

we conducted a series of two-way (group by time) repeated measures analyses of variance (ANOVAs). Because of the small sample size, statistical power was very limited. Using Cohen's (1988) criteria, we had power of only .13 to detect a medium-sized Group × Time interaction effect in the population at $p < .05$, and only .23 power to detect a large effect. In light of this, we also examined the changes within each treatment group separately, using one-way repeated measures ANOVAs. We followed up significant ANOVAs with planned contrasts (t tests) of pretreatment to midtreatment and pretreatment to posttreatment. We also calculated the actual effect sizes obtained in these within-group contrasts, computed as the difference between pretreatment and posttreatment means divided by the standard deviation of the pre-post difference score. Cohen suggests interpretation of t test effect sizes greater than .20, .50, and .80 as "small," "medium," and "large," respectively. Finally, for each individual patient, we determined whether the amount of change from pretreatment to posttreatment, on each continuous measure for which norms are available, was clinically significant, using criterion "c" described by Jacobson and Truax (1991). This is the score midway between our sample mean at pretreatment and the normative mean, adjusting for the standard deviations of the two populations. Posttreatment scores below this represent clinically significant change.

Results

All variables were approximately normally distributed, except the number of parasuicidal acts and number of hospitalizations, both of which were markedly skewed in distribution. The inverse or reciprocal transformation of number of parasuicides was approximately normally distributed and was used in analyses. Several transformations failed to normalize number of hospitalizations, so data on that variable were analyzed using nonparametric tests.

Pretreatment Group Comparisons

The two treatment groups did not differ significantly at pretreatment on any of a number of key demographic and clinical characteristics, and on only one of the dependent variables (Table 2). Participants in TAU scored significantly higher than participants in DBT on the Hamilton Anxiety Rating Scale, $t(18) = 2.49$, $p = .02$. Importantly, pretreatment anxiety was not significantly associated with degree of change on any outcome measure. Although the DBT group had considerably more lifetime and recent parasuicides and recent inpatient hospital days than the TAU group, this was due primarily to just two patients in DBT, so these group differences at pretreatment were not statistically significant.

Treatment Contact

The groups were comparable on hours of individual therapy [DBT: $M = 18.8$, $SD = 3.1$; TAU: $M = 16.7$, $SD = 3.7$, $t(18) = 1.38$, *ns*] and number of

TABLE 2
OUTCOME MEASURES ACROSS COURSE OF TREATMENT, BY CONDITION

Variable	Group	Pre		Mid		Post		Pre-Mid	Pre-Post	Pre vs. Post	Group × Time
		M	*SD*	*M*	*SD*	*M*	*SD*	*F*	*F*	Effect Size[a]	F(2, 36)
Parasuicides	DBT	5.1	13.2	1.6	3.7	0.40	1.3	2.50	4.75[t]	0.35	2.44[t]
Past 3 months	TAU	0.7	1.3	1.1	2.3	1.0	2.2	0.03	0.01	0.28	—
Suicidal	DBT	36.2	13.5	34.9	13.5	26.2	8.0	0.89	9.64*	0.98	3.71*
Ideation	TAU	44.6	11.4	41.9	13.3	41.5	14.3	1.61	2.89	0.54	—
Hopelessness	DBT	11.9	6.7	0.4	7.5	5.1	5.3	1.63	17.08**	1.31	8.03**
	TAU	13.6	6.8	12.0	7.8	14.2	7.3	1.25	0.30	−0.18	—
Hamilton	DBT	29.7	13.7	24.7	10.1	17.1	5.7	4.67[t]	12.40**	1.12	0.71
Depression	TAU	32.6	9.7	31.1	11.3	24.3	7.8	0.88	9.09*	0.95	—
Beck	DBT	22.8	11.1	21.3	13.4	13.4	7.5	0.25	9.35*	0.96	3.70*
Depression	TAU	34.7	14.6	27.0	14.6	29.3	17.7	25.40**	5.93*	0.77	—
Hamilton	DBT	18.4	7.3	18.1	8.4	19.1	7.5	0.02	0.13	−0.31	1.32
Anxiety	TAU	27.7	9.3	25.8	10.7	32.2	12.4	1.07	1.79	−0.42	—
Anger In	DBT	22.9	5.7	19.3	5.4	17.3	4.0	6.19*	11.00**	1.04	1.71
	TAU	20.5	4.7	18.2	5.4	19.2	6.2	6.99*	0.31	0.17	—
Anger Out	DBT	18.2	5.7	17.3	4.8	14.5	3.9	0.67	13.38**	1.16	5.89**
	TAU	17.2	5.8	14.6	3.1	17.9	6.1	3.16	0.16	−0.12	—
Dissociation	DBT	22.3	15.2	20.0	16.2	13.2	12.0	0.79	13.00**	1.13	1.21
	TAU	41.0	22.4	29.5	22.5	30.6	23.3	3.05	2.40	0.48	—
BPD Criteria	DBT	6.8	1.1	—	—	3.6	1.6	—	79.45**	2.83	0.79[b]
	TAU	6.7	0.8	—	—	4.2	2.3	—	12.64**	1.13	—

[t] $p < .10$; * $p < .05$; ** $p < .01$.

[a] Effect size computed as Mpre − Mpost/*SD*pre-post.

[b] BPD criteria were assessed only at pretreatment and posttreatment. Degrees of freedom for *F* test are (1, 18).

telephone contacts [DBT: $M = 6.0$, $SD = 4.5$; TAU: $M = 8.0$, $SD = 2.7$, $t(18) = 1.21$, *ns*]. Not surprisingly, DBT patients attended many more hours of group therapy [DBT: $M = 32.1$, $SD = 9.6$; TAU: $M = 11.8$, $SD = 11.2$; $t(18) = 4.35$, $p < .001$]. TAU subjects attended many more hours of 30-minute medication-management visits [DBT: $M = 2.7$, $SD = 2.2$; TAU: $M = 7.6$, $SD = 4.2$; $t(18) = 3.27$, $p < .01$].

Treatment Effects

Parasuicide. The proportion of patients who reported any intentional self-harm (including suicide attempts) during the previous 3 months dropped from 50% at pretreatment to 10% at posttreatment in DBT, and from 30% to 20% in TAU. The difference between the proportions going from any parasuicide to no parasuicide and those going in the other direction (none) was almost significant for DBT ($z = 1.50$, $p = .07$, one-tailed), but not for TAU ($z = 0.00$, $p = 1.00$). Similarly, two-way repeated measures ANOVA of number of parasuicidal acts (inverse transformed), indicated a $p < .10$ trend for a Group × Time interaction, with DBT having a greater reduction than TAU (Table 2). One-way ANOVAs showed a significant change across the three assessment points in DBT, $F(2, 18) = 3.71$, $p = .04$, but not for TAU, $F(2, 18) = 0.02$, $p = .98$. Planned contrasts indicated a $p = .06$ trend for a decrease in number of parasuicides in the DBT group from pre- to posttreatment, which represents a small- to medium-sized effect (Table 2). There was no change in number of parasuicides across the course of treatment for the TAU group, $F(2, 36) = 1.42$, $p = .25$.

Suicidal ideation and hopelessness. Two-way repeated measures ANOVAs indicated significant Group × Time interaction effects, in which the DBT group decreased significantly more than the TAU group on suicidal ideation and on hopelessness (Table 2). In the one-way analyses within each condition, the DBT group showed significant change across the three measurement points on suicidal ideation, $F(2, 18) = 9.25$, $p = .008$, and on hopelessness, $F(2, 18) = 9.57$, $p = .004$. DBT patients reported significantly less suicidal ideation and hopelessness at posttreatment than at pretreatment and both effect sizes were large. TAU patients did not significantly change across the three assessment points, $F(2, 18) = 1.34$, $p = .29$, for suicidal ideation; $F(2, 18) = 1.33$, $p = .29$, for hopelessness. Sixty percent of DBT patients, compared with 20% of TAU patients, met the criterion for clinically significant change on suicidal ideation. The figures for hopelessness were 70% of DBT and 20% of TAU patients.

Mood and emotion measures. On the BDI, two-way repeated measures ANOVAs revealed a significant Group × Time interaction effect (Table 2). DBT patients reported a significantly greater decrease in depression than TAU patients. One-way ANOVAs within each group nonetheless indicated that both groups' BDI scores decreased significantly across the three measurement points: for DBT, $F(2, 18) = 5.75$, $p = .012$, and for TAU, $F(2, 18) = 5.80$, $p = .026$. The pre- to posttreatment difference represents a large effect

for DBT and a medium effect for TAU. Sixty percent of DBT patients and 20% of TAU patients met the criterion for clinically significant change on the BDI. On the HAM-D, the Group × Time interaction in the two-way ANOVA was not significant (Table 2). One-way ANOVAs showed that both groups' HAM-D scores decreased significantly across the three measurement points: for DBT, $F(2, 18) = 8.68, p = .005$, and for TAU, $F(2, 18) = 7.06, p = .011$. Both effect sizes were large. Norms are not available for this 25-item version of the HAM-D, so the clinical significance criterion could not be applied.

On the Hamilton Anxiety Rating Scale, two-way ANOVA indicated no significant Group × Time interaction (Table 2). In the one-way ANOVAs, the TAU group showed a trend toward change, $F(2, 18) = 3.18, p = .09$, but Table 2 shows this change was a small decrease from pre- to midtreatment followed by a rise at posttreatment to a higher level than at pretreatment. Neither of the planned contrasts approached significance (both $p > .20$). The DBT group showed no indication of change in anxiety, $F(2, 18) = 0.11, p = .89$.

On Anger Out, two-way ANOVA yielded a significant Group × Time interaction effect (Table 2). The DBT group decreased significantly more than the TAU group. In one-way ANOVAs, the DBT group demonstrated significant change across all measurement points, $F(2, 18) = 7.43, p = .005$, and the planned contrast for pre- versus posttreatment indicated a significant reduction in anger expression that represents a large effect size. The TAU group showed no significant change in Anger Out across the course of treatment, $F(2, 18) = 2.56, p = .11$.

On Anger In, the two-way ANOVA did not yield a significant Group × Time interaction effect (Table 2). Nonetheless, just as for Anger Out, the DBT group decreased significantly over the course of treatment, $F(2, 18) = 6.86, p = .007$, and the planned contrast for pre- versus posttreatment indicated a significant reduction in unexpressed anger that represents a large effect size. The TAU group did not show significant change across all the assessments, $F(2, 18) = 0.79, p = .42$, but the planned contrasts showed a significant reduction in Anger In from pre- to midtreatment, but then an increase by posttreatment (see Table 2). On both Anger In and Anger Out, 80% of DBT patients and 60% of TAU patients met the criterion for clinically significant change.

Dissociation. The Group × Time interaction in the two-way repeated measures ANOVA on dissociation was not significant (Table 2). Nonetheless, one-way ANOVAs within each condition showed that the DBT group changed significantly across the three assessment points, $F(2, 18) = 5.53$, $p = .018$, and reported significantly less dissociation at posttreatment than at pretreatment. The latter effect size was large. In contrast, the TAU group did not change significantly overall in dissociation, $F(2, 18) = 2.49, p = .14$, and neither of the planned contrasts were significant. Eighty percent of DBT patients and 40% of TAU patients met the criterion for clinically significant change on the DES.

Psychiatric inpatient admissions. The proportion of patients with any admissions during the prior 3 months was relatively low at pretreatment, and neither group showed significant change in this proportion by the end of treatment. For DBT, the proportions were 30% at pretreatment and 10% at posttreatment, z on proportions $= 0.71, p = .24$; for TAU, they were 20% at pretreatment, 10% at posttreatment, $z = 0.00, p = 1.0$. Friedman's analysis of variance by ranks yielded a strong trend toward reduction of numbers of hospitalizations across the course of treatment in the DBT group, $\chi^2r(1, 18) = 5.60, p = .06$, but not in the TAU group, $\chi^2r(1, 18) = 0.67, p = .72$.

BPD criteria. In posttreatment SCID-II interviews regarding the previous 3 months, only 3 of 10 DBT patients and 5 of 10 TAU patients still endorsed at least five of the eight *DSM-III-R* criteria for BPD, whereas all 10 in each condition did at pretreatment. These changes in proportion are both statistically significant, for DBT ($z = 2.27, p = .01$, one-tailed) and for TAU ($z = 1.79, p = .04$, one-tailed). Between-group comparison of these proportions was not significant using Fisher's exact test, $p = .33$. However, the odds ratio was 2.33, indicating a moderate effect size (Kraemer, 1992). Both treatment groups showed significant ($p < .01$) and very large reductions in the mean number of BPD criterion behaviors they endorsed (Table 2), and these mean decreases did not differ significantly across treatments.

Discussion

The results generally support the efficacy of DBT. Of 11 outcome variables, patients in DBT changed significantly more than did patients in TAU on 4 variables (suicidal ideation, hopelessness, Beck depression, and anger out). On 4 others, only patients in the DBT condition changed significantly (or $p = .06$ for hospitalizations), but the Group $\times$ Time interaction was not significant (number of parasuicides, number of hospitalizations, anger in, and dissociation). On 2 variables (Hamilton depression and number of BPD criteria), both groups changed significantly, and the Group $\times$ Time interaction was not significant, and on 1 variable (anxiety), neither group changed significantly. So, on 8 of 11 variables, only the DBT group showed significant change and/or they changed significantly more than the TAU group. We were able to calculate an index of clinical significance of change for 7 variables. On 6 of these (all except anxiety), the majority of DBT patients (60% to 80%) met the criterion for clinically significant change. For TAU patients, this was true only for the two measures of anger.

There are some important differences between our results and those reported by Linehan et al. (1991). First, two of the variables on which Linehan et al. found superiority of DBT, namely parasuicide and hospitalization, did not show significant treatment group difference in our study. Nonetheless, only the DBT patients showed a significant reduction in number of parasuicidal acts, and a strong trend on number of psychiatric hospitalizations. The lack of between-group significance may reflect our small sample sizes and

the fact that not all patients were parasuicidal at pretreatment, as required by Linehan et al. The TAU group may have particularly suffered from a floor effect on these two variables. Patients in that condition had fewer recent parasuicides and had spent less time recently hospitalized, on average, at pretreatment, and therefore had less room to change.

Second, this study found superior efficacy of DBT over TAU on several variables that did not show differential changes in the Linehan et al. (1991) study, including measures of suicidal ideation, hopelessness, and depression. Because our sample was less behaviorally extreme than Linehan's (less parasuicidal behavior), participants may have been more amenable to change on these emotion- and cognition-related behaviors, or therapists may have been more able to focus on them.

Finally, in this study, unlike Linehan et al., participants in the TAU condition showed a low dropout rate (17%), comparable to DBT (23%), and a high rate of therapy attendance. These may have been affected by the free provision of treatment in or near the facility where the patients received all their health care, during a period in which the VA made outreach efforts to make women veterans comfortable in the facility. Distance from the facility and transportation difficulties were major factors in the few treatment dropouts in both groups.The major limitation of the study is its small sample size: 10 participants in each condition. First, this limited our statistical power to demonstrate significant treatment group differences. Second, it limits our ability to generalize from our sample. The degree to which present results are influenced by variability among individual participants is probably greater than is optimal. Third, the treatment groups differed significantly on anxiety at pretreatment. A larger sample would make this less likely, and groups could deliberately be matched, at least on parasuicide and hospitalization, in future studies.

A second limitation is that the treatment conditions differed in ways other than just the proposed active treatment ingredients, such as the significant differences in amount of group therapy and medication management visits. However, TAU patients had a higher frequency of medication visits, rather than lower frequency, so this is unlikely to explain the superior outcomes of the DBT patients. Although the difference in group therapy may have influenced our findings, there is some reason to doubt that it is the sole explanation for them. An unpublished pilot study by Linehan, Heard, and Armstrong (cited in Linehan, 1993a) found that patients in non-DBT individual therapy (TAU) who were randomly assigned to either DBT skills group ($n = 11$) or to no skills group ($n = 8$) had outcomes that did not significantly differ. Their outcomes were also similar to those of the TAU patients and poorer than those of the DBT patients in Linehan et al. (1991). This is just one study with a small sample, however, and the results do not address the utility of the skills group either on its own or within the full DBT treatment model.

Another potentially important difference between conditions is that only the DBT therapists were conducting a standardized, novel treatment in which

they had been intensively trained and about which they were enthusiastic. It would be preferable to compare DBT with another standardized treatment for BPD, delivered by well-trained, supervised, and enthusiastic therapists. No such treatment manual was available at the time of the study. Not only Linehan et al. (1991), but also the only other published randomized study of a psychosocial treatment for BPD (Bateman & Fonagy, 1999) also involved comparison with a TAU condition, as did the only published randomized studies of CBT for suicidal behavior (Evans et al., 1999; Salkovskis et al., 1990). It is worth noting that in our study, half of the TAU therapists described their orientation as cognitive-behavioral, so their treatment may have been similar to some aspects of DBT, which would work against the treatment group differences we found. However, we do not know what any TAU clinicians actually did. It would be helpful to videotape the comparison condition in future studies.

There are no follow-up data to address the issue of durability of effects. This is important because Linehan et al. (1993) found that, although the DBT group's improvements were mostly maintained at 6- and 12-month follow-up, the TAU group caught up to them on some measures.

Finally, our results are for women veterans who met particular diagnostic inclusion and exclusion criteria. We do not know whether they would generalize to nonveteran women, to men, or to individuals with comorbid schizophrenia, bipolar disorder, substance dependence, antisocial personality disorder (our exclusion criteria), or other disorders. Also, we do not know how effective the treatment would be for those who did not begin or dropped out, if they could be retained. If nonattendance partly reflects motivation, their outcomes may have been poorer.

Even if DBT has efficacy in a controlled research setting, it becomes important to know how easily such a complex treatment for multiproblem patients can be disseminated to clinicians in a variety of settings, and what outcomes those clinicians obtain (effectiveness research). In the present study, the mean score for therapist-patient dyads was just in the adherence range, indicating that an independent team of clinicians outside of Seattle can perform DBT to adherence. However, some of the adherence ratings were not quite in that range.[2] The generally positive efficacy results therefore suggest that DBT may be effective in nonresearch clinical settings, in which therapists typically are not trained to research adherence criteria prior to treating patients. In this context, it is worth noting some uncontrolled (pre-post only)

[2] We examined the relations between each therapist's mean adherence ratings for a given patient and that patient's degree of change on each of our outcome measures. Because of the small sample ($n = 10$ in DBT), we were interested in any effects with $p < .10$. Of 11 outcome measures, adherence was related only to greater reduction in Hamilton depression scores (partial $r = -.76, p = .02$) and to less reduction in suicidal ideation (partial $r = .64, p = .06$). The other 9 partial correlations all had $p < .22$, and 4 were negative in sign and 5 positive. We conclude that there was no consistent relation between therapist treatment adherence and patient outcomes in our sample.

but nonetheless intriguing outcome data from a DBT program at a community mental health center that received the American Psychiatric Association's 1998 Gold Achievement Award for outstanding small community-based program (Mental Health Center of Greater Manchester, New Hampshire, 1998). During the first year of the program, patients showed the following decreases: 77% in hospital days, 76% in partial hospital days, 56% in crisis bed days, 80% in emergency room face-to-face contacts, and 50% in total treatment costs, despite more than a tripling in number of scheduled outpatient visits. There was also a 300% increase in the number of patients employed.

In conclusion, despite its small sample size, this study demonstrates that DBT can be conducted with reasonably good adherence by a group of therapists at a site independent of the treatment's developer. The treatment was associated with clinically significant changes in the symptoms and functioning of borderline patients, changes that were significantly greater than those associated with treatment as usual on a number of measures. The results also suggest that the efficacy of DBT is not limited only to patients with recurrent suicidal and self-injurious behavior, a conclusion also supported by studies recently completed with borderline substance abusers (Linehan et al., in press). These pilot data suggest that it is worthwhile to further investigate DBT for borderline patients. Studies that would be useful at this stage include: (a) traditional efficacy studies comparing DBT with another standardized treatment, each delivered by therapists who have already demonstrated adequate treatment adherence, with larger samples and follow-up assessments; (b) dismantling studies examining the relative efficacy of specific treatment components and their combinations (e.g., the modes of individual therapy, skills group, between-session coaching, and consultation, or acceptance-oriented and change-oriented strategies); (c) large-scale effectiveness studies comparing DBT with TAU in nonresearch clinical settings. Finally, there is an urgent need to investigate the efficacy of DBT with other clinical populations for whom it has begun to be adapted in many clinical settings.

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