Dialectical Behavior Therapy for Adolescents With Repeated Suicidal and Self-harming Behavior: A Randomized Trial

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Objective: We examined whether a shortened form of dialectical behavior therapy, dialectical behavior therapy for adolescents (DBT-A) is more effective than enhanced usual care (EUC) to reduce self-harm in adolescents. **Method:** This was a randomized study of 77 adolescents with recent and repetitive self-harm treated at community child and adolescent psychiatric outpatient clinics who were randomly allocated to either DBT-A or EUC. Assessments of self-harm, suicidal ideation, depression, hopelessness, and symptoms of borderline personality disorder were made at baseline and after 9, 15, and 19 weeks (end of trial period), and frequency of hospitalizations and emergency department visits over the trial period were recorded. **Results:** Treatment retention was generally good in both treatment conditions, and the use of emergency services was low. DBT-A was superior to EUC in reducing self-harm, suicidal ideation, and depressive symptoms. Effect sizes were large for treatment outcomes in patients who received DBT-A, whereas effect sizes were small for outcomes in patients receiving EUC. Total number of treatment contacts was found to be a partial mediator of the association between treatment and changes in the severity of suicidal ideation, whereas no mediation effects were found on the other outcomes or for total treatment time. **Conclusion:** DBT-A may be an effective intervention to reduce self-harm, suicidal ideation, and depression in adolescents with repetitive self-harming behavior. Clinical trial registration information—Treatment for Adolescents With Deliberate Self Harm; http://ClinicalTrials.gov/; NCT00675129. J. Am. Acad. Child Adolesc. Psychiatry, 2014;53(10):1082–1091. **Key Words:** self-harm, attempted suicide, psychotherapy, randomized trial

Self-harming behavior (nonfatal self-poisoning or self-injury with or without suicide intent)[1] in adolescents is a serious public health problem in many countries. According to population studies, between 5% and 10% of adolescents report past-year self-harm, with cutting as the most commonly reported method. Relief from intensely unpleasant emotions or dying are reported as the most common reasons for such behavior.[2,3] Only 10% to 20% of adolescents who have self-harmed report receiving any kind of subsequent treatment.[4] Even fewer report having received treatment in child and adolescent psychiatric services. Among those who are referred to specialized care, many will be noncompliant with the treatment or will drop out prematurely because of treatment-interfering characteristics of the adolescents, their families, or the clinical services. Self-harm is a powerful predictor of completed suicide.[5] There is thus a strong need to develop effective interventions that are accessible and acceptable to adolescents and their families, as well as feasible for clinicians in community mental health settings.

Repetitive self-harm is very often linked to personality disorders, in particular to borderline

This article is discussed in an editorial by Dr. Alan Apter on page 1048.

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personality disorder (BPD); this has been well demonstrated in adult populations.[6] Affective instability and a pronounced sensitivity to environmental stress are among the BPD characteristics shown to increase vulnerability for suicidal and self-harm behavior.[7] Individuals diagnosed with BPD are typically highly emotionally reactive, their reactions tend to be extreme, and the time taken to return to their baseline affective state is often considerably longer than for individuals without BPD. Although clinicians and researchers diagnose personality disorders primarily in adults, in the past decade, more clinical researchers have assessed and identified personality traits and disorders in youth.[8] Such traits are highly predictive of adult personality disorders and are associated with increased long-term impairment, morbidity, and mortality.[9] An important question to answer is whether therapeutic interventions in adolescence could prevent the development of adult personality disorders linked to self-harming behavior.

The paucity of randomized controlled trials (RCTs) offers scarce evidence for effective treatments for self-harming adolescents. Wood *et al.*[10] developed a manual-based cognitive-behavioral therapy–oriented group therapy for adolescents that was shown to be more effective than treatment as usual (TAU) in reducing self-harm behaviors; however, these results were not replicated in 2 subsequent studies from the same group.[11,12] In a recent RCT reported by Rossouw and Fonagy,[13] mentalization-based treatment for adolescents was superior to TAU in reducing self-harm and depression. However, with this notable exception, no treatment program specifically targeting self-harm in adolescents has so far been shown to reduce self-harm more than usual care. The recent critical review of Brent *et al.*[14] provides a good update on intervention studies targeting adolescent suicidal behaviors.

Dialectical behavior therapy (DBT) is a comprehensive, principle-based, multi-modal, outpatient treatment that was developed by Linehan[6] for adults with BPD; it was found, in several RCTs at independent sites, to be superior to comparison treatments in reducing suicidal and nonsuicidal self-harm, emergency department visits, and hospitalizations, improving outpatient treatment completion, global and social adjustment, and personality functioning.[15-20] DBT has since been adapted by Miller *et al.* for outpatient treatment of self-harming adolescents (DBT-A) with borderline personality traits,[21] through shortening treatment length from 12 months to 3 to 5 months, including parents or other caregivers in weekly skills training groups, and adding a new skills module to address common skill deficits among teens with emotion dysregulation and their families. Several uncontrolled studies have suggested that DBT-A could be effective at reducing self-harm while improving treatment compliance and satisfaction.[22-27] However, to date, no RCTs of DBT-A have been published. Although RCT studies of standard DBT for adults offer favorable results, our knowledge of the effectiveness of a considerably shorter and modified DBT for adolescents and their families is limited. The primary hypothesis consequently examined in this study was that DBT-A would be superior to usual care in reducing self-harm behavior, suicidal ideation, and depressive symptoms in self-harming adolescents with BPD features.

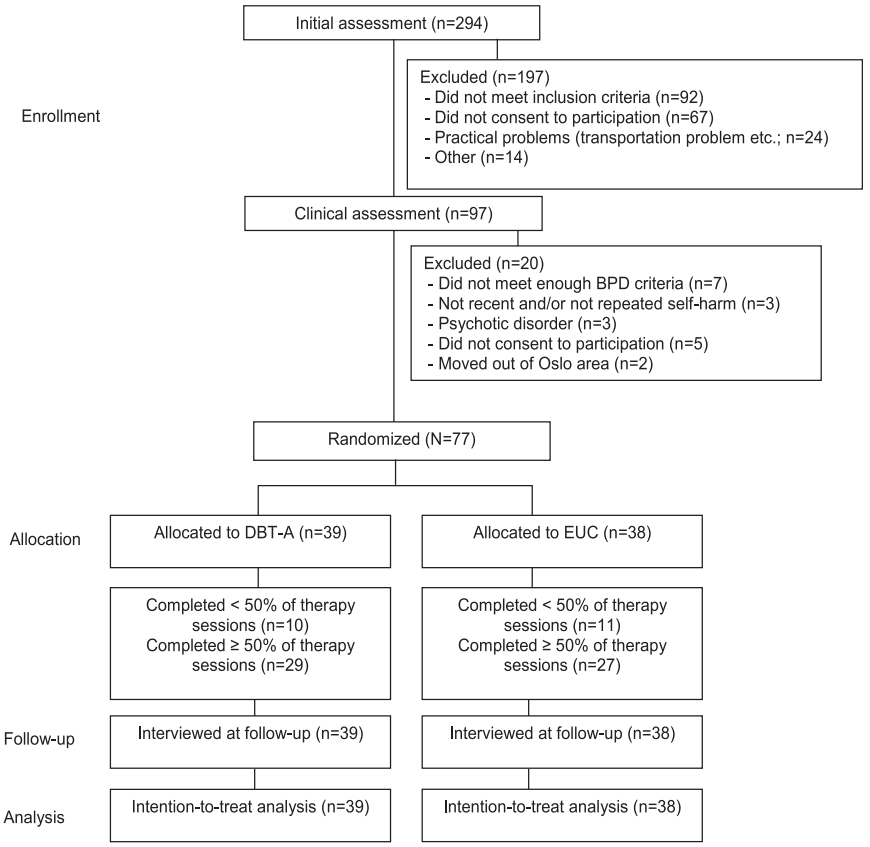
METHOD

This was a single-blind randomized trial comparing DBT-A with enhanced usual care (EUC). Participants were randomly allocated (Figure 1) to receive either treatment at 1 of the participating child and adolescent psychiatric outpatient clinics in a 1:1 ratio stratified according to gender, presence of major depression, and presence of suicide intent during the most serious episode of self-harm behavior within the 16 weeks before enrollment. Treatment allocation of participants after baseline assessments was based on a permuted block randomization procedure with an undisclosed and variable blocking factor, and daily management of the randomization procedures was performed by an external group.

Participants

Participants were 77 adolescents (age 12 through 18 years) recruited from child and adolescent psychiatric outpatient clinics in Oslo that screened newly referred patients for current self-harm behavior. If screened positively, the patient and the parents were invited to a diagnostic interview in which the remaining inclusion criteria were checked. Diagnostic assessments were made by experienced clinicians blinded to treatment allocation. Inclusion criteria were as follows: a history of at least 2 episodes of self-harm, at least 1 within the last 16 weeks; at least 2 criteria of *DSM-IV* BPD (plus the self-destructive criterion), or, alternatively, at least 1 criterion of *DSM-IV* BPD plus at least 2 subthreshold-level criteria; and fluency in Norwegian. Exclusion criteria were a diagnosis of bipolar disorder (except bipolar II), schizophrenia, schizoaffective disorder, psychotic disorder not otherwise specified, intellectual disability, and Asperger syndrome. Self-harm was defined as self-poisoning or

FIGURE 1 CONsolidated Standards of Reporting Trials (CONSORT) flowchart of participants, comparing dialectical behavior therapy adapted for adolescents (DBT-A) with enhanced usual care (EUC) for suicidal and self-harming behavior. Note: BPD = borderline personality disorder.



self-injury irrespective of intent,[1] including self-harm with suicidal intent, nonsuicidal self-harm, and self-harm episodes with unclear intent. From March 2008 to March 2012, a total of 152 screen-positive adolescents recruited from the participating child and adolescent psychiatric outpatient clinics plus an additional 142 adolescents referred directly to the study from general practitioners, child protection services, or school health services were initially checked for inclusion criteria (Figure 1). Of these, 97 were assessed through interviews, and of these, 77 adolescents were included in the study and randomized.

Treatments and Therapists

Patients received either DBT or EUC by therapists working at and funded by the 10 child and adolescent psychiatric outpatient clinics participating in the study. These clinics were all publicly funded, and all treatments were provided free of charge to the patients and their families. Therapists provided only DBT or EUC. Patients received ancillary non-manualized pharmacotherapy as needed.

Dialectical Behavior Therapy. Dialectical Behavior Therapy,[21] delivered for 19 weeks, consisted of 1 weekly session of individual therapy (60 minutes), 1 weekly session of multifamily skills training (120 minutes), and family therapy sessions and telephone coaching with individual therapists outside therapy sessions as needed. Fifteen psychologists and psychiatrists previously unfamiliar with DBT were recruited for the purpose of the trial and were trained through an 80-hour seminar with an additional 12 months of supervised practice on clinical training cases, and were rated for adherence to DBT-A treatment principles. From these candidates, 8 therapists (2 psychiatrists, 5 clinical psychologists, and 1 educational psychologist) were selected after having completed a consistently adherent training case, that is, a patient for whom the therapist under training (in DBT-A) was able to deliver the treatment consistently at the adherent level (score of 4.0 or above) throughout the 19 weeks of treatment of that patient. Adherence to DBT continued to be assessed throughout the trial. For each patient–therapist dyad in individual therapy, 5 videotaped sessions (first 2 sessions and 3 random) were rated by

an independent rater (S.L.) trained to and maintaining reliability with the treatment developer group in the use of the DBT Global Rating Scale (M.M. Linehan, unpublished, 2003), a 64-item instrument scored from 0 to 5, with higher scores reflecting higher adherence. On average, 1 randomly selected videotaped skills training session per group was rated per month. Adherence was defined as a sum score of $\geq$4.0.

Enhanced Usual Care. Enhanced usual care was 19 weeks of standard care (enhanced for the purpose of the study by requiring that EUC therapists agree to provide on average no less than 1 weekly treatment session per patient throughout the trial) delivered by therapists (4 psychiatrists, 16 clinical psychologists, 6 clinical social workers, 2 clinical pedagogues, 1 specialist nurse, and 1 psychology graduate student) not trained in or practicing DBT. EUC was not manualized or checked for fidelity, and was either psychodynamically oriented therapy or cognitive-behavioral therapy combined with psychopharmacological treatment as needed. EUC was delivered for a minimum of 19 weeks but could extend beyond the trial time window, depending on the EUC therapists' assessments of their patients' needs. (Further details are provided in the section on treatment implementation and retention).

Patient Safety. The study complied with National Institute of Mental Health (NIMH) recommendations[28] for intervention research with patients at high risk for suicidality. All study therapists received suicide risk assessment and management training before patient treatment commenced. For both treatment modalities, results from the baseline assessments of suicide and self-harm risk, psychiatric diagnoses, and symptom severity were made available to the attending therapists before the first therapy session. Also, when a patient's follow-up data indicated high risk of self-harm or suicide, the study management immediately notified the patient's therapist. The study was approved by the Regional Committee for Medical Research Ethics, South-East Norway, and all patients and parents provided written informed consent.

Assessments

Assessments were performed by independent interviewers blind to treatment allocation at baseline (interview and self-report) before randomization and then at 9 (self-report), 15 (self-report), and 19 weeks (interview and self-report) after the first treatment session. The Schedule for Affective Disorders–Present and Lifetime version (K-SADS-PL)[29] was used to obtain demographics and *DSM-IV* Axis I diagnoses and the Structured Clinical Interview for DSM-IV (SCID-II)[30] was used to evaluate BPD. The Child Behavior Checklist (CBCL)[31] for parents measured adolescents' emotional and behavioral problems, and the Children's Global Assessment Scale (C-GAS)[32] measured global level of impairment. The Lifetime Parasuicide Count (LPC) interview[33] was used to obtain self-harm history, and the Suicide Intent Scale (SIS)[34] evaluated suicide intent at the most severe self-harm episode during the last 4 months. Participants received a small amount of monetary compensation for each assessment session.

Outcome Measures

The primary outcomes were as follows: the number of self-reported self-harm episodes (suicide attempts and non-suicidal self-harm episodes combined); the severity of suicidal ideation as measured by the 15-item self-report Suicidal Ideation Questionnaire (SIQ-JR; suicidal thoughts rated on a 7-point scale from "I never had this thought" to "almost every day")[35]; and level of depressive symptoms as measured by the 13-item version of the self-report Short Mood and Feelings Questionnaire (SMFQ)[36] and through the interviewer-rated 10-item Montgomery–Åsberg Depression Rating Scale (MADRS)[37] during the treatment trial period. Other outcomes were hopelessness, measured by the 20-item self-report Beck Hopelessness Scale (BHS)[38]; borderline symptoms, assessed through the 23-item self-report Borderline Symptom List (BSL)[39]; and hospital admissions and emergency department visits because of self-harm during the trial. The SIQ-JR, SMFQ, BHS, and BSL were measured at baseline and after 9, 15, and 19 weeks, whereas self-harm was measured at 9 weeks (covering the first 9 weeks) and 15 weeks (covering the next 6 weeks), and MADRS was measured at baseline and 19 weeks.

Raters and Integrity of Ratings

Two child and adolescent psychiatrists and 2 doctoral-level clinicians, blinded to treatment allocation, conducted the baseline interviews. Ten independent assessors, blinded to treatment allocation and to results from baseline interviews, conducted interviews at trial completion. To ensure the integrity of blinding, a nonblinded project coordinator made all of the practical arrangements for follow-up interviews and collected treatment history data. All patients were instructed not to disclose any information about their treatment. When asked after completion of interviews which treatment they thought each patient received, assessors' responses were correct for 44.2% of patients (Cohen's $\kappa = 0.12$), indicating that blinding was successful. All interviews were audio-taped, and interrater reliability (IRR) of diagnoses and outcome variables was checked by a child and adolescent psychiatrist (A.M.S.) who was expert in the relevant assessment instruments. Based on 26 IRR-rated interviews, the mean κ value was 0.68 (range = 0.50–0.81, standard deviation [SD] = 0.10) for all symptoms rated with K-SADS-PL. Intraclass correlation (ICC) was used to test IRR for C-GAS (ICC = 0.42), MADRS score (ICC = 0.76), LPC (IRR = 0.99), and SCID-II diagnostic criteria for BPD (ICC = 0.66).

Statistical Analysis

As exact data on the repetition rate of self-harm over a 19-week observation period for adolescents treated with DBT-A or EUC were not available when the study was planned, the power analysis anticipated a repetition rate over this time span of 50% for adolescents receiving EUC, and 25% for patients receiving DBT-A (building on adult studies of DBT). The power analysis anticipated a 25% research assessment drop-out rate. With an α error level of 0.05, a sample of 150 patients (75 in each group) would be required to provide 80% power with a 2-tailed test. To limit the number of patients subjected to potential nonresponse, a revised mid-study power analysis was planned. This analysis, using a more stringent nominal significance level (0.029) according to the recommendations by Pocock,[40] conducted after completion of the first 40 patients where no research dropouts had been observed, and with a self-harm repetition of 30% for DBT patients and 83% for EUC patients, revealed that the necessary number of patients to be included could be reduced to 80 (40 in each group).

Data analysis was by intention to treat. Means and standard deviations or median and interquartile ranges were computed for normally and non-normally distributed variables. Differences between central tendencies in the groups were tested by independent-sample t tests or Mann–Whitney U tests. Differences between the group proportions were tested by Pearson χ^2 or Fisher exact tests. Estimation of trend and differences between group trends over time were examined by mixed-effects multiple regression, with the sum

TABLE 1 Baseline Demographic and Diagnostic Data and Number of Suicide Attempts and Nonsuicidal Self-Harm Episodes in Adolescent Patients (N = 77) Allocated to Receive 19 Weeks of Dialectical Behavior Therapy (DBT) or Enhanced Usual Care (EUC)

	DBT (n = 39)		EUC (n = 38)		Total Sample (N = 77)	
Variable[a]	**n**	**%**[b]	**n**	**%**[b]	**N**	**%**[b]
Female sex	34	87.2	34	89.5	68	88.3
Norwegian ethnicity	30	78.9	32	91.4	62	84.9
High school graduate	15	39.5	12	32.4	27	36.0
Parents currently married	17	43.6	17	44.7	34	44.2
Child protection (current)	6	15.4	7	18.4	13	16.9
Child protection (past)	10	26.3	11	28.9	21	27.6
Past psychiatric treatment	28	73.7	23	62.2	51	68.0
Past psychopharmacotherapy	2	5.4	6	17.1	8	11.1
Current psychopharmacotherapy	6	15.4	3	7.9	9	11.7
Current *DSM-IV* Axis I and II diagnoses						
MDD	9	23.1	8	21.1	17	22.1
Other depressive disorder	16	41.0	13	34.2	29	37.7
Panic disorder	2	5.1	5	13.2	7	9.1
PTSD	7	17.9	6	15.8	13	16.9
Any anxiety disorder	18	46.2	15	39.5	33	42.9
Any SUD	1	2.6	1	2.6	2	2.6
Any eating disorder	3	7.7	3	7.9	6	7.8
BPD	10	26.3	5	14.3	15	20.5
Attempted suicide last 4 months	11	28.2	9	23.7	20	26.0
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Age (y)	15.9	1.4	15.3	1.6	15.6	1.5
C-GAS score	55.3	8.0	57.9	10.1	56.1	8.3
CBCL total score, by parent (n)	69.6	11.0	68.4	8.9	69.0	9.8
BPD criteria fulfilled (n)[c]	4.0	2.0	3.0	3.0	4.0	2.0
Current *DSM-IV* Axis I disorders (n)[c]	2.0	1.0	1.0	3.0	1.0	2.0
Suicide attempts, lifetime (n)[d]	2.1	5.2	1.3	2.8	1.7	4.2
Nonsuicidal self-harm, lifetime (n)[c]	49.5	159.5	25.0	45.5	34.0	88.0

Note: BPD = borderline personality disorder; CBCL = Child Behavior Checklist; C-GAS = Children's Global Assessment Scale; MDD = major depressive disorder; PTSD = posttraumatic stress disorder; SUD = substance use disorder.

[a] *No significant differences between the treatment groups were found on any baseline characteristics.*

[b] *There were slight variations in the percentage basis because of missing data in some cells.*

[c] *Median and interquartile range.*

[d] *The median was 0 for both groups. The interquartile ranges were 1.0 and 1.3 in the DBT and EUC groups, respectively.*

scores as dependent variables. A random intercept and slope for each patient with an unstructured variance–covariance matrix was used. A likelihood ratio test was used to examine whether the time trend was nonlinear using the maximum likelihood method. For data on repeated self-harm over the course of the trial, generalized estimating equations (GEE) with Poisson and robust variance were used to test for between-group differences in the average numbers of self-harm. Mediation analyses were conducted using structural equation models for outcomes with normal distribution and generalized structural equation models for count data with mean overdispersion. The maximum likelihood estimation method was used in all mediation analyses. All tests were 2-sided, and the significance level was set to .05. Analyses were performed with STATA 13[41] and IBM SPSS Statistics 20.0 for Windows.[42]

RESULTS

Sample Characteristics

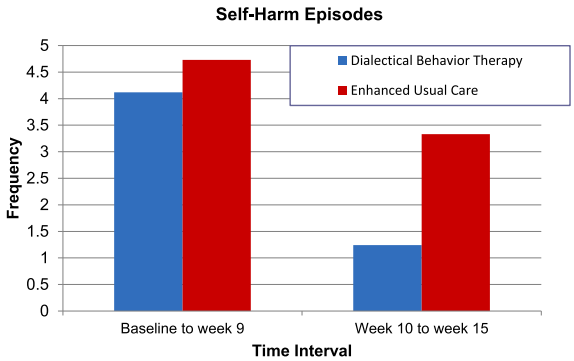
Screening, assessment, and randomization procedures leading to allocation of 77 adolescents to either DBT-A (n = 39) or EUC (n = 38) are summarized in Figure 1. Although some patients dropped out of treatment, all patients were followed from baseline to trial completion with no dropouts from the research. Baseline demographic characteristics, diagnostic variables, and pretreatment suicidal and nonsuicidal self-harm behaviors are displayed in Table 1. No significant differences between the treatment groups were found on any baseline characteristics.

Treatment Implementation and Retention

Altogether, 169 individual DBT sessions from the 39 DBT patient–therapist dyads and 56 multifamily skills-training group sessions were scored for adherence. The mean score for individual therapy sessions was 4.11 (SD = 0.14; range = 3.43–4.37) and for multifamily skills-training sessions, 4.18 (SD = 0.10; range = 3.93–4.36), both within the adherent range.

Patients in the DBT-A condition were enrolled in the skills training groups after they had attended on average 3 individual therapy sessions (according to the DBT-A protocol, new patients were admitted only at the start of each 4-week skills training module) for practical reasons. The total duration of the treatment was therefore 19 weeks (3 + 16). For comparability reasons, treatment retention in both DBT-A and EUC patients was counted as number of treatment sessions and number of weeks receiving any treatment during this 19-week period. Within this period, DBT-A patients attended an average of 13.8 (SD = 6.9) individual sessions, 11.2 (SD = 5.9) skills training group sessions, 2.6 (SD = 2.2) family therapy sessions, and 3.3 (SD = 4.5) brief intersession telephone contacts. The corresponding figures for EUC patients were 11.5 (SD = 6.4) individual sessions, 0.5 (SD = 2.1) group therapy sessions, 5.8 (SD = 9.8) family therapy sessions, and 3.5 (SD = 4.4) telephone sessions. Except for group sessions, there were no significant between-group differences in the number of sessions attended. The average number of weeks (holiday absence omitted) receiving any treatment was 14.9 (SD = 5.6) for DBT-A patients and 12.9 (SD = 5.1) for EUC patients. More than 3 dropped individual therapy sessions is considered dropout in DBT-A, and according to this criterion, 10 patients (25.6%) dropped out. In the EUC group, where such strict dropout rules were not applied, 11 patients (28.9%) attended less than 50% of the weekly individual therapy sessions. Three DBT-A patients (7.7%) used at least 1 psychotropic drug for a mean number of 94.7 days (SD = 64.3), whereas 5 EUC patients (13.2%) used such medication for a mean number of 72.8 days (SD = 16.6), with no significant differences.

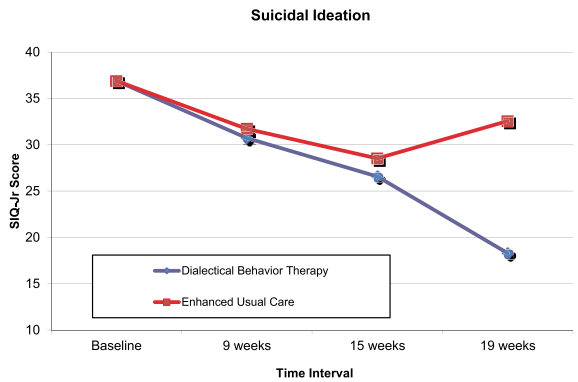
FIGURE 2 Comparison between patients receiving dialectical behavior therapy adapted for adolescents (DBT-A; n = 39) and enhanced usual care (EUC; n = 38) in frequency of self-harming episodes during the treatment trial. Note: Frequency of self-harm episodes was compared for the time periods from baseline to week 9 of the trial and from week 10 to week 15. Generalized estimating equation analyses with Poisson distribution using exchangeable correlation structure with robust variance showed that only the DBT-A group significantly decreased self-harm frequency, and the between-group difference was statistically significant (Δ slope= −0.92, 95% CI = −1.69, −0.15, p = .021).



Suicidal and Self-harm Behaviors and Suicidal Ideation

There were no suicides during the trial period. The self-harm frequency in the 2 treatment conditions during the 2 measured time intervals of the trial period is shown in Figure 2. Whereas EUC patients reported a mean of 4.7 (SD = 5.5) episodes in the first 9 weeks and 3.3 (SD = 6.8) in the subsequent 6 weeks, DBT-A patients reported a mean of 4.1 (SD = 5.8) and 1.2 (SD = 2.0) episodes in the corresponding time intervals. The average drop on logarithmic scale in self-harm frequency in the DBT-A group (slope = −1.28, 95% CI = −1.77 to −0.80, $p < .001$) was highly significant, whereas the drop in the EUC group (slope = −0.36, 95% CI = −0.99 to 0.26, $p = .254$) was not. The between-group difference was statistically significant (Δ slope= −0.92, 95% CI = −1.69 to −0.15, $p = .021$). Both treatment groups had a baseline severity of suicidal ideation well above the clinical cut-off (usually regarded as 31)[35] and showed similar reductions on this dimension over the first 15 weeks (Figure 3 and Table 2), continuing to drop in DBT-A patients throughout the whole trial period, while leveling off toward the end of the trial in EUC patients. This intergroup difference was statistically significant according to mixed-effects linear regression analysis (Δ slope = −0.62 per week, $p = .010$).

FIGURE 3 Comparison between patients receiving dialectical behavior therapy adapted for adolescents (DBT-A; n = 39) and enhanced usual care (EUC; n = 38) in severity of suicidal ideation during the treatment trial. Note: SIQ-Jr = Suicidal Ideation Questionnaire–Junior Version. Suicidal ideation was measured at baseline and after 9, 15, and 19 weeks during the trial. Mixed-effects linear regression analysis revealed a statistically significant between-group difference in the reduction of suicidal ideation over time (Δ slope = −0.62 per week, $p = .010$).



Depressive Symptoms

Both patient groups displayed a significant reduction in self-reported symptoms of depression, but only the DBT-A group showed a significant reduction in interviewer-rated depression; this between-group difference was statistically significant according to mixed-effects linear regression analysis (Table 2).

Outcomes in Patients Who Completed the Treatment

A separate series of analyses was conducted with only those patients who had dropped less than 4 treatment sessions (dropout criterion in DBT-A; n = 47). The differences between the 2 treatment conditions remained significant for all 3 primary outcome variables.

Associations Between Outcomes and Intensity of Treatment

The differences both in the mean duration of the treatment and the mean total number of treatment sessions between the 2 treatment conditions led us to conduct a series of analyses to test whether these 2 variables would mediate the association between the treatment and the 3 primary outcomes. Total number of treatment contacts was found to be a partial mediator of the association between treatment and SIQ-Jr score, whereas no mediation effects were found on the other outcomes or for total treatment time.

Other Outcomes

The DBT-A group reported reductions in hopelessness and borderline symptoms (Table 2), but with no significant between-group differences on these outcomes. One DBT-A patient and 2 EUC patients were admitted to the hospital because of self-harm during the trial. An additional 2 DBT-A patients and 5 EUC patients had an emergency department visit for self-harm. These differences were not statistically significant.

DISCUSSION

This was the first randomized trial of the efficacy of a short version of DBT adapted for the treatment of multi-problem self-harming adolescents with BPD features. Treatment retention in this

TABLE 2 Outcomes for Adolescent Patients (N = 77) Allocated to Receive 19 Weeks of Dialectical Behavior Therapy (DBT) or Enhanced Usual Care (EUC), by Treatment Assignment

	DBT (n = 39)				EUC (n = 38)					
Variable	Mean	SD	*p* Value Slope	Effect Size[a]	Mean	SD	*p* Value Slope	Effect Size[a]	Δ Slope[b]	*p*-Value Δ Slope
Suicidal ideation (SIQ-Jr)										
Baseline	36.91	20.82	<.001	0.89	36.91	26.73	.101	0.16	−0.62	.010
9 wk	30.72	17.53			31.71	21.20				
15 wk	26.58	13.55			28.53	20.97				
19 wk	18.30	11.11			32.56	23.99				
Hopelessness (BHS)										
Baseline	11.48	5.41	<.001	0.97	10.35	5.81	.072	0.22	−0.13	.071
9 wk	10.43	5.80			10.00	6.13				
15 wk	10.33	5.88			8.48	6.20				
19 wk	6.23	5.30			9.06	6.53				
Depression (SMFQ)										
Baseline	14.92	5.35	<.001	0.88	15.11	6.23	.012	0.41	−0.10	.179
9 wk	12.87	6.17			13.39	5.60				
15 wk	12.77	6.31			12.23	5.85				
19 wk	10.19	5.04			12.58	6.62				
Depression (MADRS)										
Baseline	19.03	7.84	<.001	0.86	17.50	7.13	.075	0.24	−0.22	.019
19 wk	12.29	7.52			15.76	8.14				
Borderline symptoms (BSL)										
Baseline	38.47	19.32	<.001	0.89	40.18	21.66	.061	0.25	−0.50	.050
9 wk	33.63	17.35			34.94	18.57				
15 wk	33.85	20.04			33.67	21.28				
19 wk	21.34	14.38			34.75	22.15				

Note: BHS = Beck Hopelessness Scale; BSL = Borderline Symptoms List; MADRS = Montgomery–Åsberg Depression Scale; SIQ-Jr = Suicidal Ideation Questionnaire–Junior Version; SMFQ = self-report Mood and Feelings Questionnaire.

[a]*The mean improvement from baseline to 19 weeks divided by the standard deviation at baseline. All effect sizes are given as positive values.*

[b]*Estimates of difference in slope (per week).*

study was generally good, with no differences between the 2 treatment conditions. DBT was superior to EUC in reducing frequency of self-harm, severity of suicidal ideation, and depressive symptoms, with generally large effect sizes for outcomes in the DBT-A condition, but weak or moderate outcomes in the EUC condition. Interestingly, for several outcome measures, differences between the treatment conditions increased toward the last third of the trial period; DBT-A patients continued their improvement, whereas EUC patients did not.

Previous DBT studies in adults have suggested that teaching specific behavioral skills may be an important factor in the reduction of self-harm and depression.[43] Early monitoring and explicit targeting of self-harm throughout the 19 weeks of DBT-A may also have represented an important treatment component. No suicides were observed, and overall there were few hospital admissions or emergency department visits, although there was a nonsignificant trend for DBT-A patients to have fewer visits.

Despite the high population prevalence of self-harm in adolescents, little evidence of effective treatments exists. Adolescents with borderline traits and repetitive self-harm have usually been considered a difficult-to-treat patient population because of their reluctance to accept treatment and their tendency to drop out early, and because of patient safety issues. This first randomized trial of DBT-A suggests that it is indeed possible for adolescents to be engaged, retained, and treated successfully and safely. Only mentalization-based treatment (MBT-A)[13] has so far demonstrated comparable results. From a pragmatic and economic perspective, an important difference between these treatments is the 3-times-longer duration of MBT-A (1 year) compared to DBT-A (4 months). Within the limited observation period, we detected no significant group differences with respect to the intensity of borderline

symptoms. Follow-up studies are needed to clarify the long-term course of both this and other outcomes.

All treatments in this trial were delivered at community child and adolescent psychiatric outpatient clinics at no cost to the families, within the framework of the universal health insurance system of Norway. Our patient sample was thus probably less skewed with respect to socioeconomic factors than studies in other contexts; this strengthens the external validity of findings toward similar urban treatment settings. Both DBT-A individual therapy sessions and the multifamily skills training were rated within the adherent range, showing that DBT-A can indeed be successfully delivered within a community mental health setting, not just in university research clinics or by experts with many years of DBT experience.

Although these findings are promising, this study has several important limitations. The study was adequately powered; however, the sample size was small, and findings should be interpreted with caution. The control condition, EUC, was not a manualized treatment, and EUC therapists were not monitored for fidelity. Only DBT-A patients received skills-training group sessions; this implied a significant difference in the treatment intensity between interventions. Although our analyses gave few indications that treatment intensity served as a mediator of the association between treatment and outcomes, the possibility that this may have been an important factor should not be neglected. As in most trials of self-harm, the patient sample was mostly female, and the sample was too small to study gender differences in treatment outcomes.

Among the study's strengths are the absence of dropout from the research, the application of rigorous procedures for data collection, the integrity of ratings and blinding, and the independence of raters. The liberal inclusion criteria and the delivering of treatments in a community mental health setting with patients recruited from a defined catchment area strengthen the external validity of the findings.

Future studies, preferably with larger samples and long-term follow-up evaluations, are needed to clarify whether these positive results will persist. Questions left to be addressed are what the active ingredients in DBT-A are, and whether focusing on specific symptom domains (such as self-harm and suicidal ideation) rather than an entire range of behaviors in the lives of multi-problem adolescents would be more effective. &

CG Clinical Guidance

- DBT-A is an effective treatment for self-harming adolescents with traits of borderline personality disorder in terms of reducing self-harm behavior, suicidal ideation, and depressive symptoms.
- DBT-A is feasible to administer at a high level of treatment fidelity in community child and adolescent psychiatric outpatient clinics.
- DBT-A has a substantially shorter duration than most comparable psychotherapeutic interventions targeting self-harming adolescents.

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REFERENCES

1. Hawton K, Rodham K, Evans E, Weatherall R. Deliberate self harm in adolescents: self report survey in schools in England. BMJ. 2002;325:1207-1211.
2. Madge N, Hewitt A, Hawton K, *et al*. Deliberate self-harm within an international community sample of young people: comparative findings from the Child and Adolescent Self-harm in Europe (CASE) Study. J Child Psychol Psychiatry. 2008;49:667-677.
3. Jacobson CM, Gould M. The epidemiology and phenomenology of non-suicidal self-injurious behavior among adolescents: a critical review of the literature. Arch Suicide Res. 2007;11:129-147.
4. Ystgaard M, Arensman E, Hawton K, *et al*. Deliberate self-harm in adolescents: comparison between those who receive help following self-harm and those who do not. J Adolesc. 2009;32: 875-891.
5. Owens D, Horrocks J, House A. Fatal and non-fatal repetition of self-harm. Systematic review. Br J Psychiatry. 2002;181:193-199.
6. Linehan MM. Cognitive-Behavioral Treatment of Borderline Personality Disorder. New York: Guilford Press; 1993.
7. Soloff PH, Lynch KG, Kelly TM, Malone KM, Mann JJ. Characteristics of suicide attempts of patients with major depressive episode and borderline personality disorder: a comparative study. Am J Psychiatry. 2000;157:601-608.
8. Miller AL, Muehlenkamp JJ, Jacobson CM. Fact or fiction: diagnosing borderline personality disorder in adolescents. Clin Psychol Rev. 2008;28:969-981.
9. Winograd G, Cohen P, Chen H. Adolescent borderline symptoms in the community: prognosis for functioning over 20 years. J Child Psychol Psychiatry. 2008;49:933-941.
10. Wood A, Trainor G, Rothwell J, Moore A, Harrington R. Randomized trial of group therapy for repeated deliberate self-harm in adolescents. J Am Acad Child Adolesc Psychiatry. 2001;40: 1246-1253.
11. Hazell PL, Martin G, McGill K, *et al*. Group therapy for repeated deliberate self-harm in adolescents: failure of replication of a randomized trial. J Am Acad Child Adolesc Psychiatry. 2009;48: 662-670.
12. Green JM, Wood AJ, Kerfoot MJ, *et al*. Group therapy for adolescents with repeated self harm: randomised controlled trial with economic evaluation. BMJ. 2011;342:d682.
13. Rossouw TI, Fonagy P. Mentalization-based treatment for self-harm in adolescents: a randomized controlled trial. J Am Acad Child Adolesc Psychiatry. 2012;51:1304-1313.e1303.
14. Brent DA, McMakin DL, Kennard BD, Goldstein TR, Mayes TL, Douaihy AB. Protecting adolescents from self-harm: a critical review of intervention studies. J Am Acad Child Adolesc Psychiatry. 2013;52:1260-1271.
15. Carter GL, Willcox CH, Lewin TJ, Conrad AM, Bendit N. Hunter DBT project: randomized controlled trial of dialectical behaviour therapy in women with borderline personality disorder. Aust NZ J Psychiatry. 2010;44:162-173.
16. Clarkin JF, Levy KN, Lenzenweger MF, Kernberg OF. Evaluating three treatments for borderline personality disorder: a multiwave study. Am J Psychiatry. 2007;164:922-928.
17. Koons CR, Robins CJ, Tweed JL, *et al*. Efficacy of dialectical behavior therapy in women veterans with borderline personality disorder. Behav Ther. 2001;32:371-390.
18. Linehan MM, Armstrong HE, Suarez A, Allmon D, Heard HL. Cognitive-behavioral treatment of chronically parasuicidal borderline patients. Arch Gen Psychiatry. 1991;48:1060-1064.
19. Linehan MM, Comtois KA, Murray AM, *et al*. Two-year randomized controlled trial and follow-up of dialectical behavior therapy vs therapy by experts for suicidal behaviors and borderline personality disorder. Arch Gen Psychiatry. 2006;63:757-766.
20. Verheul R, Van Den Bosch LM, Koeter MW, De Ridder MA, Stijnen T, Van Den Brink W. Dialectical behaviour therapy for women with borderline personality disorder: 12-month, randomised clinical trial in the Netherlands. Br J Psychiatry. 2003;182: 135-140.
21. Miller AL, Rathus JH, Linehan MM. Dialectical Behavior Therapy with Suicidal Adolescents. New York: Guilford Press; 2007.
22. Woodberry KA, Popenoe EJ. Implementing dialectical behavior therapy with adolescents and their families in a community outpatient clinic. Cogn Behav Pract. 2008;15:9.
23. James AC, Taylor A, Winmill L, Alfoadari K. A preliminary community study of dialectical behavior therapy (DBT) with adolescent females demonstrating persistent, deliberate self-harm (DSH). Child Adolesc Ment Health. 2008;13:7.
24. Fleischhaker C, Bohme R, Sixt B, Bruck C, Schneider C, Schulz E. Dialectical Behavioral Therapy for Adolescents (DBT-A): a clinical trial for patients with suicidal and self-injurious behavior and borderline symptoms with a one-year follow-up. Child Adolesc Psychiatry Ment Health. 2011;5:3.
25. Cooney E, Davis K, Thompson P, Wharewera-Mika J, Stewart J. Feasibility of Evaluating DBT for Self-harming Adolescents: a Small Randomised Controlled Trial. Auckland, New Zealand: Te Pou o Te Whakaaro Nui; 2010.
26. Katz LY, Cox BJ, Gunasekara S, Miller AL. Feasibility of dialectical behavior therapy for suicidal adolescent inpatients. J Am Acad Child Adolesc Psychiatry. 2004;43:276-282.
27. Rathus JH, Miller AL. Dialectical behavior therapy adapted for suicidal adolescents. Suicide Life Threat Behav. 2002;32:146-157.
28. Pearson JL, Stanley B, King C, Fisher C. Issues to Consider in Intervention Research with Persons at High Risk for Suicidality. Rockville, MD: National Institute of Mental Health; 2001.
29. Kaufman J, Birmaher B, Brent D, *et al*. Schedule for Affective Disorders and Schizophrenia for School-Age Children–Present and Lifetime Version (K-SADS-PL): initial reliability and validity data. J Am Acad Child Adolesc Psychiatry. 1997;36:980-988.
30. First MB, Spitzer RL, Gibbon M, Williams JBW. Structured Clinical Interview for DSM-IV Personality Disorders, (SCID-II). Washington, DC: American Psychiatric Press; 1997.
31. Achenbach TM. ASEBA. Manuals for TheYouth Self Report (11-18) and the Child Behavior Checklist/6-18. Burlington, VT: Department of Psychiatry. University of Vermont; 2001.
32. Shaffer D, Gould MS, Brasic J, *et al*. A Children's Global Assessment Scale (CGAS). Arch Gen Psychiatry. 1983;40:1228-1231.
33. Linehan MM, Comtois KA. Lifetime Parasuicide Count. Seattle: University of Washington; 1996.
34. Beck AT, Schuyler D, Herman I. Development of suicide intent scales. In: Beck AT, Resnick HLP, Lettiem D, Bowie MD, eds. The Prediction of Suicide. Philadelphia: Charles Press; 1974.
35. Reynolds WM, Mazza JJ. Assessment of suicidal ideation in inner-city children and young adolescents: reliability and validity of the suicidal ideation questionnaire–JR. School Psych Rev. 1999; 28:17-30.
36. Angold A, Costello J, Messer SC. Development of a short questionnaire for use in epidemiological studies of depression in children and adolescents. Int J Methods Psychiatr Res. 1995;5: 237-249.
37. Montgomery SA, Asberg M. A new depression scale designed to be sensitive to change. Br J Psychiatry. 1979;134:382-389.
38. Beck AT, Weissman A, Lester D, Trexler L. The measurement of pessimism: the Hopelessness Scale. J Consult Clin Psychol. 1974; 42:861-865.
39. Bohus M, Limberger MF, Frank U, Chapman AL, Kuhler T, Stieglitz RD. Psychometric properties of the Borderline Symptom List (BSL). Psychopathology. 2007;40:126-132.
40. Pocock SJ. Clinical Trials. A Practical Approach. Chichester: John Wiley and Sons; 1983.
41. STATA Statistical Software [computer program]. College Station, TX: Stata Corporation; 2011.
42. IBM SPSS Statistics for Windows [computer program]. Version 20.0. Armonk, NY: IBM Corporation; 2012.
43. Neacsiu AD, Rizvi SL, Linehan MM. Dialectical behavior therapy skills use as a mediator and outcome of treatment for borderline personality disorder. Behav Res Ther. 2010;48:832-839.