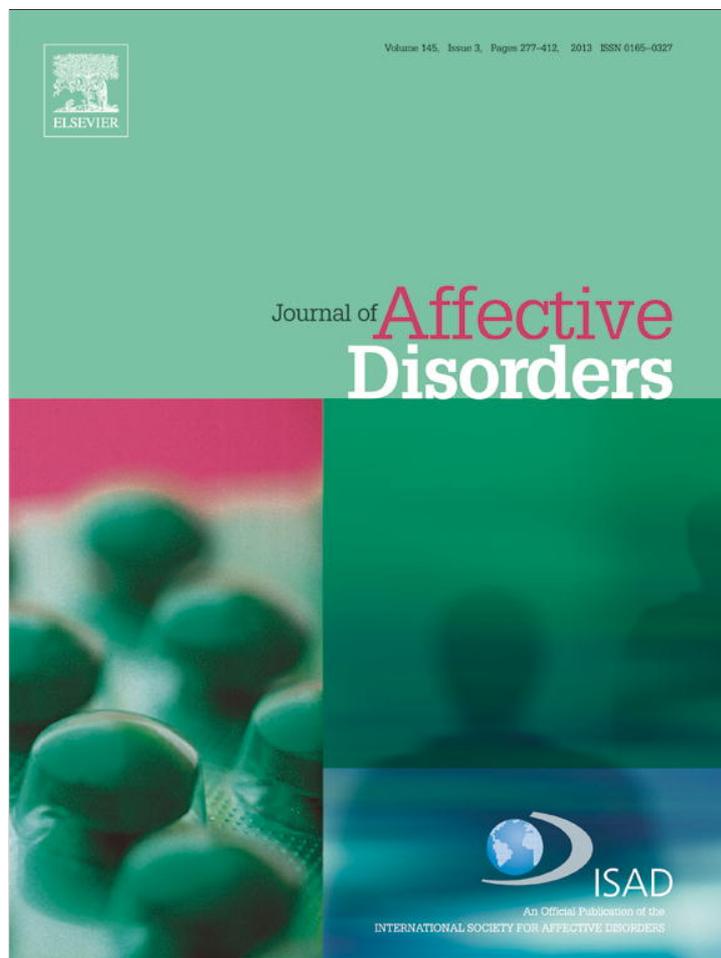


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Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

Preliminary communication

A randomized, controlled, pilot study of dialectical behavior therapy skills in a psychoeducational group for individuals with bipolar disorder

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ARTICLE INFO

Article history:

Received 31 January 2012

Accepted 30 May 2012

Available online 1 August 2012

Keywords:

Bipolar disorder

Dialectical behavior therapy

Mindfulness

ABSTRACT

Background: Bipolar disorder (BD) is a chronic and disabling psychiatric disorder characterized by recurrent episodes of mania/hypomania and depression. Dialectical behavior therapy (DBT) techniques have been shown to effectively treat borderline personality disorder, a condition also marked by prominent affective disturbances. The utility of DBT techniques in treating BD has been largely unexplored. The purpose of this research was to conduct a pilot study of a DBT-based psychoeducational group (BDG) in treating euthymic, depressed, or hypomanic Bipolar I or II patients.

Methods: In this experiment, 26 adults with bipolar I or II were randomized to intervention or wait-list control groups and completed the Beck depression inventory II, mindfulness-based self-efficacy scale, and affective control scale at baseline and 12 weeks. The BDG intervention consisted of 12 weekly 90-min sessions which taught DBT skills, mindfulness techniques, and general BD psychoeducation.

Results: Using RM-ANOVA, subjects in BDG demonstrated a trend toward reduced depressive symptoms, and significant improvement in several MSES subscales indicating greater mindful awareness, and less fear toward and more control of emotional states (ACS). These findings were supported with a larger sample of patients who completed the BDG. Furthermore, group attendees had reduced emergency room visits and mental health related admissions in the six months following BDG.

Limitations: The small sample size in RCT affects power to detect between group differences. How well improvements after the 12-week BDG were maintained is unknown.

Conclusions: There is preliminary evidence that DBT skills reduce depressive symptoms, improve affective control, and improve mindfulness self-efficacy in BD. Its application warrants further evaluation in larger studies.

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1. Introduction

Bipolar disorder (BD) is a highly recurrent and disabling condition, marked by major depression and manic/hypomanic episodes. According to the CANMAT guidelines (Yatham et al., 2009), the lifetime prevalence of bipolar I is 1.0%; bipolar II is 1.1%; and sub-threshold bipolar is 2.4%. The impact of this illness is considerable, including reduced opportunities for education and work (Leahy, 2007); increased rates of substance abuse and dependence, making the illness more difficult to treat (Altman et al., 2006); and increased rates of divorce (Leahy, 2007). In addition, for those with BD, the rate of suicide attempts has been documented to be as high as 50% (Rizvi and Zaretsky, 2007), with

lifetime rates for completed suicide reported to be 60 times higher than for the general population (Leahy, 2007).

Although mood-stabilizing medication is the corner-stone of treatment for BD, most patients are not fully stabilized on drug therapies alone: even when patients remain on medication, rates of recurrence average 40% to 60% (Gitlin et al., 1995). As well, a large number of patients experience residual symptoms or on-going mood cycling, so that full functional recovery is uncommon (Treuer and Tohen, 2010). An additional problem is the fact that 50% of people with BD have at least one episode of medication non-adherence (Zaretsky et al., 2007); and that polypharmacy is the rule rather than the exception in BD, and mood stabilizing medications are associated with a host of side-effects that can affect adherence to treatment.

Group psychoeducation and psychotherapy, such as cognitive-behavioural therapy (CBT) and interpersonal social rhythm therapy (IPSRT) are recommended treatments to complement medication management in BD (Rizvi and Zaretsky, 2007). Studies have

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shown CBT to be effective in treating depressive episodes, but efficacy in treating manic episodes and acutely ill patients is questionable (Rizvi & Zaretsky, 2007). One study by Scott and colleagues (2001) concluded that CBT may be most suited to patients in the early stages of the illness, or to those with a less recurrent course of BD.

IPSRT, on the other hand, when delivered in the acute treatment phase, has been shown to delay recurrences of bipolar episodes (Frank, 2007). However, in an article reviewing efficacy of psychotherapies for BD, Miklowitz (2008) concluded that "... (BD) is a highly chronic, disabling, and recurrent illness, and our existing treatment options are inadequate for maintaining long-term stability. Even with optimal psychotherapy and pharmacotherapy, recurrences occurred in 50–75% of patients in 1 year" (2008, p. 1417).

Therefore, it is imperative that we continue to look for more effective psychotherapies that will be helpful to our patients with BD. Dialectical behavior therapy (DBT) techniques have not yet been studied or routinely applied in BD, but there are reasons to believe they may be helpful.

Studies have demonstrated that DBT is the most effective treatment for borderline personality disorder (Bohus et al., 2000; Linehan et al., 1991; Linehan et al., 1993). Given the similarities between these two illnesses (e.g., emotion dysregulation, suicidality, impulsivity, interpersonal difficulties and treatment non-adherence), it is reasonable to hypothesize that DBT would also be an effective treatment for BD.

DBT is a treatment originally designed to help individuals primarily with problems in regulating their emotions, and the subsequent difficulties this creates. Mindfulness, which is one component of DBT, has been studied as a treatment for many different mental illnesses such as depression and depression relapse (Teasdale et al., 2000); generalized anxiety disorder (Kutz et al., 1985; Miller et al., 1995); and panic disorder (Kabat-Zinn et al., 1992). Only two small studies have looked at the use of mindfulness-based cognitive therapy (MBCT) for BD, the first found some improvement in symptoms of anxiety and mania, as well as a reduction in suicidal ideation (Williams et al., 2008). The second found no improvement in symptoms, but the authors reported that clients subjectively noted an improvement in their ability to cope with emotions (Weber et al., 2010).

In light of this research, the investigators in the present study further believed that the mindfulness practice involved in DBT would be particularly beneficial to individuals with BD given the fact that depression is a large component of BD, as well as the high co-morbidity rate of BD with anxiety disorders. The purpose of this pilot study was to evaluate the feasibility and effectiveness of the bipolar disorder group (BDG), a DBT skills-based psychoeducational group with emphasis on mindfulness practice, in euthymic, depressed, or hypomanic bipolar patients.

2. Methods

This study was a randomized control trial (RCT) in which the control group was a wait condition. All patients who were eligible to participate in the DBT group were randomized to enter the group immediately (intervention group) or to wait 12 weeks until the next group (wait-list control). In this way, all patients had the opportunity to participate in the group intervention. Given the small number of patients (13 assigned per group; 12 per group completed questionnaires and completed the study), secondary analysis was conducted using an additional 56 patients who completed the BDG (total $n=75$) to increase study power and allow for confirmation of the RCT results.

2.1. Sample and procedures

All adults, at least 18 years of age, who were referred to the Brief Therapy Clinic at Southlake Regional Health Centre with a diagnosis of BD were eligible for inclusion in the study. Individuals were excluded if they were currently in a manic state, had a concurrent diagnosis of a developmental delay, had on-going violent or aggressive behaviours which might pose a threat to other group members, or were unable to read and comprehend the English language. No potential group members were excluded.

Once referred to the group, each patient met individually with the group facilitator for 30 to 60 min to obtain history, assess current symptoms, confirm eligibility and explain the group process and content, and describe the study (as well as treatment alternatives). If interested in participating in the study, patients reviewed and signed consent with the researcher and completed the first set of questionnaires (pretest/baseline): the Beck depression inventory, the mindfulness based self-efficacy scale, and the affective control scale. A demographics questionnaire and the young mania rating scale (YMRS) were completed by the group facilitator based on this interview. The YMRS and initial interview were used together to potentially identify symptoms of mania and hypomania which would exclude individuals from participating in the group program; one subject was identified as mildly hypomanic, but no potential study participants were excluded.

Once consent was obtained and baseline data collected from 26 patients, they were randomly assigned to intervention and control (wait-list) groups. Group assignments were placed in sealed envelopes by a hospital staff person who was not involved in the study. Study identification numbers were assigned and recorded on the master list, which was kept separate from consents and completed questionnaires to ensure that data would remain anonymous; and data were considered to be confidential.

Sample was set at 13 per group (intervention and wait-list control) because this was optimal group size in which to offer the group intervention and appropriate for the first phase of the study, a pilot RCT. Twenty-six subjects were recruited. As noted above, a larger sample was used for additional analysis: of 108 patients who were assessed to participate in eight different BDG as per the study procedures 56 completed BDG and both sets of questionnaires; these data were added to data collected from the intervention group in RCT ($n=12$) and those in the control group who completed BDG following their wait time ($n=7$).

The proposal was approved by the ethics review board of Southlake Regional Health Centre for both the original RCT and for extraction of data from charts of 56 patients who had participated in BDG and had completed questionnaires, in accordance with the Helsinki declaration of 1975. Data were extracted by the group facilitator and entered into SPSS 17.0 by a researcher using study identification numbers; no identifying information was reviewed or entered by the researcher.

2.2. The intervention

The BDG consisted of twelve 90-min sessions: two sessions focused on providing education about BD, including symptoms, types and causes of BD; one full session was a presentation by a psychiatrist on medications used to treat BD; and one full session focused on the importance of self-care (balancing sleep, eating, exercise, abstaining from drugs and alcohol, and building mastery). The other eight sessions focused on distress tolerance skills to help people not act on urges and to get through crisis situations without making things worse; emotion regulation skills, including general information about emotions, skills to help people reduce the amount of emotional pain they are experiencing, and how to tolerate these

painful emotions when they cannot be changed; and interpersonal effectiveness skills to help people develop healthier relationships.

Throughout the entire 12 weeks, mindfulness (living in the present moment with acceptance) was taught and emphasized as an important skill to help people manage their illness and their emotions. The traditional DBT skills (Linehan, 1993) were pared down to fit into this adapted 12 week model (see Table 1).

Concomitant therapy: All participants in this study were instructed to continue to see their psychiatrist or family physician as usual for maintenance of medication. They were also directed to continue working with case managers, individual therapists, or other professionals they would normally see. Patients in the wait-list control group were provided with information regarding what to do if they were in crisis, and had access to the group facilitator to discuss this if the need arose, but no individual service was provided by the group facilitator while clients were awaiting group.

2.3. Data collection questionnaires

The Beck depression inventory (BDI-II) is a well-established self-report questionnaire comprised of 21 items to measure the severity of depression in individuals aged 13 years and over. The BDI-II (Beck et al., 1996) was used to assess severity of depression. The validity and reliability for the BDI-II are well established. It takes approximately 5 min to complete. Scores are calculated by adding up answers to each question scored from 0 to 3 how much the symptom was experienced in the past two weeks, including today. Categories can be computed: 0 to 13 for minimal depression, 14 to 19 for mild depression, 20 to 28 for moderate depression, and 29–63 for severe depression.

The mindfulness based self efficacy scale (MSES) was developed to measure the effects of mindfulness training (Cayoun and Freestun, 2004). Construct and concurrent validity, and reliability (internal consistency, $\alpha = .86$) have been reported. MSES has 35 items that measure levels of perceived self-efficacy by rating level of agreement from 0 (not at all) to 4 (completely). In addition to a total score, the MSES has seven subscales: Behavior, Cognition, Interoception, Affect, Interpersonal, Avoidance, and Mindfulness; each scale contains five items, some items are reverse scored. It takes approximately 6 min to complete, and is appropriate for adolescents and adults.

Table 1
Intervention by week.

Week	Skills taught
One	Psychoeducation about BD: facts about depression, mania/hypomania and psychosis Introduction to mindfulness
Two	Psychoeducation about BD: what is BD, causes of BD DBT skill: states of mind
Three	Psychiatrist presentation on medications for BD
Four	DBT skill: reducing vulnerability to emotions: balancing eating, sleeping, exercise, eliminating drugs and alcohol, treating physical illness and taking medications, and building mastery
Five	DBT skill: nonjudgmental stance
Six	DBT skill: radical acceptance
Seven	DBT skills: distracting, self-soothing, pro's and con's, urge management
Eight	Facts about emotions DBT skill: self-validation
Nine	DBT skill: opposite to emotion action
Ten	Looking at relationships DBT skill: balancing enjoyable activities with responsibilities
Eleven	Assertiveness
Twelve	Presentation of resources to continue with treatment of BD, completion of post-questionnaires

The affective control scale (ACS) is a 42 item self-report questionnaire developed to measure belief in ability to control emotions (Williams et al., 1997) by rating extent of agreement on a 7-point Likert scale from 1 (very strongly disagree) to 7 (very strongly agree). Initial validity (discriminant and convergent) and reliability (internal consistency and stability) were reported for young adults (Berg et al., 1998; Williams, 1992). Four subscales (Anger, Positive Affect, Depressed Mood, and Anxiety) can be calculated using the mean for item scores, some of which are reverse scored; a total score is calculated in the same way.

The young mania rating scale (YMRS) is an eleven-item, multiple-choice questionnaire used by clinicians to measure the severity of symptoms of mania or hypomania (Young et al., 1978). Each item is rated according to the severity of that abnormality in the patient, and a score is assigned to each item based on the patient's subjective report of her condition over the previous forty-eight hours and the clinician's behavioral observations during the interview. The higher the score, the more severe the symptoms of mania or hypomania.

Information to describe study subjects included: gender, age, marital status, diagnosis, age at diagnosis of bipolar disorder, age at first depressive episode, age at first manic or hypomanic episode, number of hospitalizations, age at first hospitalization, current psychiatric and non-psychiatric medications, and other psychiatric treatment.

A twelve-question evaluation form was given to clients to complete in the final group session to illicit participants' opinions of their experience and progress in group.

2.4. Statistics

Data were entered into and analyzed using SPSS 17.0[®]. Demographic and clinical variables were compared between the intervention and wait-list control groups using independent *t*-test for continuous variables and Chi-square (χ^2) for categorical variables. Groups were also compared at baseline for questionnaire scores using independent *t*-test for total and subscales scores. Repeated measures analysis of variance (RM-ANOVA) was used to determine whether participation in the group made a difference by examining the effect of group and time. Graphical techniques were used to demonstrate differences over time. One-way ANCOVA was used to compare BDI-II scores at post-test, controlling for group differences at pre-test. In the secondary analysis of the larger data set ($n = 75$), paired *t*-test was used to determine the significance of changes in scores over the length of the BDG. Level of significance was set at .05 given the small sample size in the RCT.

3. Results

3.1. Description of sample

Twenty-six patients were recruited for the RCT, 13 were randomly assigned to the intervention and wait-list control groups; 12 of each group completed the study. The majority of subjects were female (75%), with an average age of 42.3 years; about one third (38%) were married. Average age of diagnosis of BD was 36.1 years, one was diagnosed before the age of 18 years, with first depressive episode typically as teenagers/young adults and first manic episode some time later. Most (75%) had been hospitalized an average of 2.3 times (range 0 to 12 times). Average age at first hospitalization was 29.4 years. There was no difference in the 0.26 number of visits to the Emergency Department at SRHC in the six months prior to the start of the study. As can be seen in Table 2 subjects in both groups were quite similar.

Subjects in both groups were also similar for diagnosis and treatments. Forty-two percent were diagnosed with BD I and 58% with BD II. Half (50%) had multiple diagnoses, the most common psychiatric co-morbidities being anxiety disorders (42%), and personality disorders/traits (29%), and ADHD/ADD (12%). All but one were taking psychiatric medications and 42% were taking additional medications. One quarter (25%) were also receiving individual psychotherapy, one person was receiving another group therapy, 8% were receiving case management, 21% had problems with alcohol use, and 21% used illegal substances.

3.2. Outcome measures

Randomization to intervention and control groups resulted in similar groups except for mean scores on the BDI-II (see Table 3). Subjects in the control group reported higher scores or greater depression compared to the intervention group ($t = -2.2, p = .038$).

3.3. Beck depression inventory (BDI-II)

Most of the patients in both groups had at least a moderate level of depression on entering the study. As can be seen in

Table 2
Demographic and clinical characteristics of subjects by study groups.

Characteristic	Intervention group	Control group	All
Average age (years)	40.2 (SD=12.8)	41.6 (SD=7.1)	43.2 (SD=11.1)
Gender			
Female	75% (n=9)	75% (n=9)	75% (n=18)
Male	25% (n=3)	25% (n=3)	25% (n=6)
Marital status			
Single	8% (n=1)	33% (n=4)	20% (n=5)
Married/common-law	42% (n=5)	33% (n=4)	38% (n=9)
Divorced/separated	50% (n=6)	33% (n=4)	42% (n=10)
Average age (years) at bipolar diagnosis			
	36.1 (SD=14.4)	31.4 (SD=11.8)	36.1 (SD=13.3)
Age 1st depressive episode	16.2 (SD=9.4)	16.8 (SD=13.1)	16.5 (SD=10.1)
≤ 16 years of age	50% (n=6)	66% (n=8)	58% (n=14)
17–24 years	42% (n=5)	17% (n=2)	29% (n=7)
≥ 25 years	8% (n=1)	17% (n=2)	13% (n=3)
Age 1st manic episode	26.8 (SD=13.2)	20.0 (SD=10.5)	24.9 (SD=14.9)
≤ 16 years of age	17% (n=2)	58% (n=7)	37% (n=9)
17–24 years	25% (n=3)	17% (n=2)	21% (n=5)
≥ 25 years	58% (n=7)	25% (n=3)	42% (n=10)
Average age (years) at first hospitalization			
	29.4 (SD=10.2) (n=8)	29.4 (SD=11.5) (n=10)	29.4 (SD=10.6) (n=18)
Number of hospitalizations	1.4 (SD=1.5)	3.3 (SD=3.7)	1.9 (SD=2.4)
Never hospitalized	33% (n=4)	15% (n=2)	25% (n=6)
Had been hospitalized	67% (n=8)	83% (n=10)	75% (n=18)
Hospitalization in six months pre study	0.25 (SD=0.62)	0.29 (SD=0.49)	0.26 (SD=.56)
ER visits in six months pre study	0.17 (SD=0.39)	0	0.11 (SD=.32)
Diagnosis			
Bipolar I	42% (n=5)	42% (n=5)	42% (n=10)
Bipolar II	58% (n=7)	58% (n=7)	58% (n=14)
Bipolar and anxiety disorder			
No concurrent anxiety	75% (n=9)	42% (n=5)	58% (n=14)
Concurrent anxiety	25% (n=3)	58% (n=7)	42% (n=14)
Bipolar and personality disorder/trait			
No concurrent PD	67% (n=8)	75% (n=9)	71% (n=17)
Concurrent PD	33% (n=4)	25% (n=3)	29% (n=7)
Bipolar and ADHD/ADD			
No concurrent ADHD	83% (n=10)	92% (n=18)	88% (n=21)
Concurrent ADHD	17% (n=2)	8% (n=1)	12% (n=3)
Treatment			
Psychiatric medications	92% (n=11)	100% (n=12)	96% (n=23)
Other medications	33% (n=4)	58% (n=7)	42% (n=10)
ECT	None	8% (n=1)	4% (n=1)
Psychotherapy	25% (n=3)	25% (n=3)	25% (n=6)
Group therapy	8% (n=1)	None	4% (n=1)
Case management	8% (n=1)	8% (n=1)	8% (n=2)
Problem use of alcohol	25% (n=3)	17% (n=2)	21% (n=5)
Use of illegal drugs	25% (n=3)	17% (n=2)	21% (n=5)
Use of tobacco	50% (n=6)	33% (n=4)	42% (n=10)

There were no significant differences between groups on all of the above-mentioned variables using *t*-test or χ^2 .

Table 3, the majority of subjects in both study groups were similarly categorized as having moderate or severe depression (75% in the intervention group and 93% in the control group; $\chi^2=1.2, p=.27$). At post-test, 12 weeks later, the majority of patients (92%) in the intervention group were categorized as minimal or mild depression compared to those in the control group for whom 42% were in minimal/mild categories and 58% were still categorized as having moderate to severe depression. This difference was significant ($\chi^2=6.75, p=.0009$).

As previously noted, mean scores for study groups for the BDI-II were not similar at baseline (see Table 3). Although there was also a significant difference in BDI-II scores between groups at post-test, scores dropped more for the intervention group (average reduction in BDI-II scores 16.7 points compared with 10.3 for the control group); this difference was not significant ($t=-1.5, p=.15$). RM-ANOVA analysis supported reduction in BDI-II scores over time ($F=37.52, p<.0001$) that was similar for both groups ($F=8.78, p=.007$). The intervention did not significantly affect the decline in BDI scores but this might be considered to be a trend (interaction of BDI-II scores \times group $F=2.27, p=.146$).

Analysis of variance controlling for the effect of the baseline BDI-II scores (ANCOVA) was performed to evaluate differences in post-test BDI-II scores between the two study groups. Although the model tested was statistically significant with the baseline BDI-II scores contributing most of the variance ($F=11.05, p=.003$), the effect of study group on the means at post-test approached significance ($F=3.43, p=.078$). Given the small sample size it appears the study group may have had some influence on reduction in depression symptoms when the baseline BDI scores were controlled.

3.4. Mindfulness based self efficacy scale (MSES)

RM-ANOVA was used to examine the changes in MSES total and subscale scores (Behavior, Cognition, Interoception, Affect, Interpersonal, Avoidance, and Mindfulness). As can be seen from means in Table 3 average MSES scores improved over time for both study groups indicating improved perception of self-efficacy.

The improvements are due to the intervention for the MSES total scores, and three of the subscale scores, specifically for Interpersonal, Avoidance, and Mindfulness. There is also a trend for improvements in the interoception and affect subscale scores following the intervention. There was no significant change for scores of the behavior or cognition scales.

MSES total scores: Overall, MSES total scores improved over time ($F=37.18, p<.0001$). Although mean scores of MSES total were not different in the two study groups over both time periods (between-subjects $F=2.33, p=.14$), MSES total scores increased more for the intervention group than the control group (interaction of scores \times group $F=9.41, p=.006$). As can be seen in Fig. 1, the scores were improved for all subjects in the intervention group whereas, for the control group, the pattern of scores was inconsistent as would be expected.

3.5. Affective control scale

RM-ANOVA was also used to examine the changes in affective control scale (ACS) total and subscale scores (Anger, Positive Affect, Depressed Mood, and Anxiety). As can be seen from both means in Table 3, average ACS scores improve over time (for this questionnaire lower numbers mean improvement) for both study groups but these changes are not statistically significant. There is a trend for improvements in ACS depressed mood and anxiety subscale scores following the intervention compared to subjects in the control group.

ACS—TOTAL: Although ACS total scores improved over time ($F=21.49, p<.0001$), scores were not different between the two study groups across both time periods (between-subjects $F=2.33, p=.14$). In addition, the change in scores was not significantly affected by the intervention (interaction of scores \times group $F=1.18, p=.296$).

3.6. Additional analysis with larger sample

As noted above, given that the study's power is limited by small sample size, data from other patients who completed BDG

Table 3
Outcome measures at baseline and 12 weeks later.

Characteristic	Baseline			Post-test			RM-ANOVA***
	Intervention group	Control group	All	Intervention group	Control group	All	
BDI-II							
Mean (SD)	24.6 (8.4)	33.7 (11.5) [†]	29.1 (10.9)	7.9 (6.1)	23.58 (17.1) [†]	15.8 (14.9)	$F=2.27, p=.15$
BDI categories % (n)							
Minimal/mild depression	25% (n=3)	8% (n=1)	17% (n=4)	92% (n=11)**	42% (n=5)	67% (n=16)	
Moderate/severe depression	75% (n=9)	92% (n=11)	83% (n=20)	8% (n=1)	58% (n=7)	33% (n=8)	
MSES mean (SD)							
Behavior scale	10.8 (3.1)	10.9 (4.1)	10.8 (3.6)	14.3 (2.5)	13.5 (4.5)	13.9 (3.6)	$F=0.36, p=.55$
Cognition scale	8.9 (2.8)	7.1 (3.3)	8.0 (3.1)	14.0 (3.6)	9.8 (6.2)	11.9 (5.4)	$F=1.77, p=.20$
Interoception scale	9.6 (3.1)	8.7 (3.4)	9.1 (3.2)	13.6 (31.7)	9.5 (4.5)	11.5 (3.9)	$F=3.2, p=.087$
Affect scale	8.8 (3.0)	6.8 (4.1)	7.8 (3.6)	13.7 (3.0)	9.4 (5.8)	11.5 (5.0)	$F=3.3, p=.082$
Interpersonal scale	9.8 (2.7)	10.8 (4.7)	10.3 (3.8)	14.1 (2.4)	11.5 (4.4)	12.8 (3.7)	$F=9.41, p=.006$
Avoidance scale	10.2 (4.03)	10.4 (4.3)	10.3 (4.0)	14.5 (1.3)	10.9 (5.7)	12.7 (4.5)	$F=6.79, p=.016$
Mindfulness scale	8.5 (3.8)	10.3 (4.0)	9.4 (3.9)	12.9 (2.5)	10.4 (4.3)	11.7 (3.7)	$F=9.9, p=.005$
Total score	66.5 (12.4)	65.0 (19.8)	65.8 (16.2)	97.0 (11.4)	75.1 (31.6)	86.0 (25.8)	$F=9.41, p=.006$
ACS mean (SD)							
Anger scale	4.8 (1.0)	4.5 (1.0)	4.6 (1.0)	3.8 (0.7)	4.1 (1.6)	4.0 (0.9)	$F=0.9, p=.35$
Positive affect scale	4.1 (0.9)	3.9 (1.0)	4.0 (0.9)	3.4 (0.7)	3.4 (1.6)	3.4 (1.1)	$F=0.29, p=.87$
Depressed mood scale	4.8 (1.1)	5.3 (1.2)	5.0 (1.2)	3.5 (0.7)	4.7 (1.7)	4.1 (1.4)	$F=3.67, p=.069$
Anxiety scale	4.4 (0.8)	4.9 (1.0)	4.6 (0.9)	3.5 (0.7)	4.3 (1.7)	3.9 (1.4)	$F=5.86, p=.11$
Total	4.4 (0.6)	4.6 (0.8)	4.4 (0.7)	3.5 (0.6)	4.1 (1.5)	4.0 (1.0)	$F=1.18, p=.296$

* t -test between groups $p<.05$.

** χ^2 p value $<.05$.

*** RM-ANOVA scores \times groups interaction; if $p<.05$, intervention made a difference.

and provided completed questionnaires were analyzed. These data included 7 of the 12 subjects in the wait-list control group of the RCT who subsequently completed BDG as well as patients from eight other BDG. Subjects in the wait-list control group who chose to complete BDG ($n=7$) were similar to those who chose not to do so ($n=5$) for all demographic and clinical characteristics. Comparison of 10 groups (original RCT intervention group, wait-list control group who attended BDG and attendees from eight BDG since the time of RCT) also confirmed that groups were similar at baseline.

Data from 75 patients were used to compare pre-test (baseline) and post-test scores using paired t -test. As can be seen in Table 4, at completion of BDG, patients reported (on average) that they had fewer symptoms of depression, had greater self-efficacy (all scales) and improved emotional control. Although number of visits to ER and hospitalizations were low, rate of both in the six months following participation in the BDG was significantly lower than in the six months prior to attending BDG.

3.7. Evaluation forms

Feedback from evaluation of the program was very positive in response to questions about the leader, format and focus of the

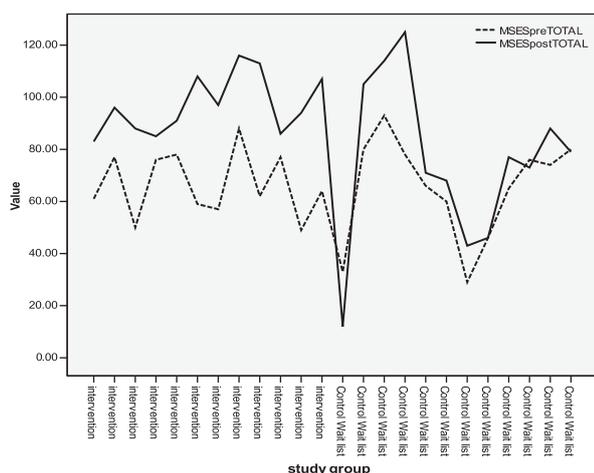


Fig. 1. Comparison of MSES total scores by subject divided into study groups.

group. The majority (75%) rated their overall impression of the group as “excellent” and 24% rated their experience as “good”; one person rated the group as “fair”.

4. Discussion

This study reports data from a pilot randomized controlled trial using DBT skills to treat BD in a psychoeducational group. The sample in this study was typical in that subjects showed a long length of illness and multiple comorbidities. As far as we know, it is the first study to look at the use of DBT skills to treat BD in adults. The results suggest significant effects of DBT skills on reducing depressive symptoms, and increasing emotional control and self-efficacy. While current findings are preliminary due to the small size of this pilot project, the BDG appears to be a useful adjunct to medications to treat BD. Twelve of 13 study participants completed the 12-week long intervention group; and 86% of group sessions were attended, which is consistent with high acceptability and satisfaction ratings from participants.

Very little is known about how DBT skills and mindfulness practice might be of use in BD. To date, there has been only one published study on the use of DBT for bipolar disorder. In this study by Goldstein et al. (2007), adolescents with BD were treated for one year with DBT. The authors found that DBT is a feasible and acceptable treatment for BD, and that significant improvement was made in suicidality, self-harming behaviors, emotional dysregulation, and symptoms of depression.

Because all of the DBT skills in some way target emotion dysregulation, it seems logical that DBT would be effective in treating BD, in which one of the primary symptoms is mood instability. The DBT Core Mindfulness Skills teach clients to be more aware of their emotions, thoughts and behaviors, and therefore result in an increase in client's degree of self-control and ability to manage distressing thoughts and emotions.

Distress tolerance skills teach clients alternative ways of coping with urges such as to suicide or self-harm, use drugs or alcohol, gamble or over-spend, and so on. Given the impulsivity associated with BD and the behaviors that patients often turn to, especially when in a manic or hypomanic episode, these skills are essential.

The emotion regulation skills help individuals learn to manage their emotions in more effective ways, through learning to

Table 4
Comparison of pre-test and post-test outcomes for secondary analysis.

Outcome	Mean (SD) pre-test	Mean (SD) post-test	t (p value)
BDI-II	25.2 (11.9)	16.6 (14.0)	5.9 (< .0001)
MSES			
Behavior scale	10.7 (3.8)	12.5 (3.8)	-3.8 (< .0001)
Cognition scale	8.6 (4.5)	10.9 (5.1)	-3.8 (< .0001)
Interoception scale	9.6 (3.4)	11.7 (3.3)	-5.5 (< .0001)
Affect scale	8.6 (4.0)	11.3 (4.3)	-6.0 (< .0001)
Interpersonal scale	10.4 (3.7)	12.6 (4.1)	-5.3 (< .0001)
Avoidance scale	10.4 (4.1)	12.5 (3.9)	-4.2 (< .0001)
Mindfulness scale	9.4 (3.9)	11.3 (3.9)	-4.2 (< .0001)
Total score	67.6 (20.5)	82.7 (23.7)	-6.2 (< .0001)
ACS			
Anger scale	4.4 (1.1)	3.8 (0.0)	6.0 (< .0001)
Positive affect scale	4.1 (1.0)	3.7 (1.0)	4.1 (< .0001)
Depressed mood	5.1 (1.2)	4.4 (1.3)	5.3 (< .0001)
Anxiety scale	4.5 (1.1)	4.0 (1.2)	4.9 (< .0001)
ACS total scores	4.5 (0.9)	4.0 (1.2)	6.4 (< .0001)
Hospitalization (in six months)*	0.31 (SD=0.74)	0.04 (SD=0.21)	3.2 (.002)
ER visits (in six months)	0.27 (SD=0.48)	0	4.6 (< .0001)

* Sample size for hospitalization & ER visit is 67 as some missing data; for rest of the analysis sample size is 75.

validate one's own emotions to prevent emotional escalation; and through acting opposite to one's emotions. This latter skill is especially helpful when dealing with episodes of depression or mania/hypomania, and when patients have a tendency to contribute to these mood states through their actions (or lack of action).

Finally, the interpersonal effectiveness skills assist patients in improving relationships in their lives. One of the many consequences of BD is that it often results in damaged relationships, whether due to the anger and irritability experienced in depressive or manic episodes; or as a consequence of behaviors people engage in while depressed or manic (e.g., abusing substances, extra-marital affairs, gambling). These skills help patients to repair their relationships when needed, and to act in ways that will minimize or even eliminate the damage that is inflicted in the first place.

Because mindfulness is such a large component of the BDG, it is useful to also look at the studies that have been conducted on using mindfulness to treat BD. To date, two small randomized controlled studies have looked at the use of mindfulness-based cognitive therapy (MBCT) for BD. In the first RCT (Williams et al., 2008), 17 people with BD attended an MBCT group along with individuals diagnosed with unipolar depression. Participants were randomized to either the MBCT group or a waiting list control group. The study demonstrated that MBCT reduced symptoms of anxiety and depression in people with BD.

The second, more recent, RCT by Weber et al. (2010) looked at a sample of 15 patients diagnosed with BD who completed an 8-week MBCT group. This study showed no improvement in symptoms, but concluded that MBCT is feasible and was well perceived among participants. In addition, the authors noted that self-report questionnaires indicated that MBCT helped subjects improve their ability to cope with their emotions.

More recently, a qualitative study was published by Chadwick et al. (2011) looking at the experience of mindfulness in individuals diagnosed with BD. These authors interviewed 12 subjects who had attended an MBCT group and had then been practicing mindfulness for at least 18 weeks. In these interviews, clients reported an increase in present moment focus, self-awareness, and acceptance; and an improved ability to manage mood states and negative thoughts.

4.1. Limitations

Small sample size is an obvious limitation of this pilot RCT affecting the power of study results. A further limitation is related to the fact that group participants continued with their usual care in addition to attending the BDG, so that improvement could be attributable to factors other than the intervention, although both groups received usual care.

The use of a wait list control of course comes with the expectancy that subjects would eventually be enrolled in the group. This could have led to some degree of positive change in the control group, which might have reduced the true group differences.

As well, the fact that elements of the BDG overlap with other treatments found to be effective for BD (such as CBT and IPSRT), makes it possible that treatment efficacy is not due specifically to the DBT skills. However, there is a logical link between skills taught in group and areas of observed clinical improvement: that is, primarily, skills focused on improving emotion regulation and improved scores on the ACS, indicating an increase in the belief in one's ability to manage emotions; and core mindfulness skills, and increased scores on the MSES, indicating an improvement in self-awareness and self-efficacy.

There is an additional limitation given the study design; the focus of the study was for the 12-week time period of the study and timing of data collection. Questionnaires were completed at the end of BDG so there is no way to know if any of the gains made by subjects were maintained over time. It is encouraging however that there were fewer visits to the emergency department and fewer hospital admissions in the six months after the BDG as compared to before.

5. Conclusion

While psychopharmacological treatment remains the cornerstone of managing BD, the lives of many patients with this illness could be improved further through adjunctive psychotherapy. Further trials evaluating the efficacy of using DBT skills to treat BD are needed, especially given the small sample in this study. Studies comparing the use of DBT skills to other treatments already proven effective in the treatment of BD (e.g., CBT, IPSRT) would be beneficial, as would trials with a follow-up to see if the gains made in the BDG are maintained over time. Finally, further identification of factors that would effect treatment response would be useful, so that patients can be matched with the treatment they are likely to benefit from most (for example, examining whether people with BD and co-morbid Axis II would be more likely to benefit from DBT-informed treatments).

Role of funding source

This study was unfunded.

Conflict of interest

There is no actual or potential conflict of interest including any financial, personal, or other relationships with other people or organizations.

Acknowledgements

We have no acknowledgements to include with this submission.

References

- Altman, S., Haeri, S., Cohen, L.J., Ten, A., Barron, E., Galynker, I.I., Duhamel, K.N., 2006. Predictors of relapse in bipolar disorder: a review. *Journal of Psychiatric Practice* 12, 269–282.
- Beck, A.T., Steer, R.A., Ball, R., Ranieri, W., 1996. Comparison of Beck depression inventories-IA and -II in psychiatric outpatients 1996. *Journal of Personality Assessment* 67, 588–597.
- Berg, C.Z., Shapiro, N., Chambless, D.L., Ahrens, A.H., 1998. Are emotions frightening? II: An analogue study of fear of emotion, interpersonal conflict, and panic onset. *Behaviour Research and Therapy* 36, 3–15.
- Bohus, M., Haaf, B., Stiglmayr, C., Pohl, U., Böhme, R., Linehan, M., 2000. Evaluation of inpatient dialectical-behavioral therapy for borderline personality disorder—a prospective study. *Behaviour Research and Therapy* 38, 875–887.
- Cayoun, B.A., Freestun, J., 2004. Mindfulness-based self-efficacy scale (MSES). Retrieved from <<http://www.mindfulness.net.au/mSES/>>.
- Chadwick, P., Kaur, H., Swelam, M., Ross, S., Ellett, L., 2011. Experience of mindfulness in people with bipolar disorder: a qualitative study. *Psychotherapy Research* 21, 277–285.
- Frank, E., 2007. Interpersonal and social rhythm therapy: a means of improving depression and preventing relapse in bipolar disorder. *Journal of Clinical Psychology* 63, 463–473.
- Gitlin, M.J., Swendsen, J., Heller, T.L., Hammen, C., 1995. Relapse and impairment in bipolar disorder. *American Journal of Psychiatry* 152, 1635–1640.
- Goldstein, T.R., Axelson, D.A., Birmaher, B., Brent, D.A., 2007. Dialectical behavior therapy for adolescents with bipolar disorder: a 1-year open trial. *Journal of the American Academy of Child and Adolescent Psychiatry* 46, 820–830.
- Kabat-Zinn, J., Massion, A.O., Kirsteller, J., Peterson, L.G., Fletcher, K.E., Pbert, L., Lenderking, W.R., Santorelli, S.F., 1992. Effectiveness of a meditation-based stress reduction program in the treatment of anxiety disorders. *American Journal of Psychiatry* 149, 936–943.
- Kutz, I., Borysenko, J.Z., Benson, H., 1985. Meditation and psychotherapy: a rationale for the integration of dynamic psychotherapy, the relaxation response, and mindfulness meditation. *American Journal of Psychiatry* 142, 1–8.
- Leahy, R.L., 2007. Bipolar disorder: causes, contexts, and treatments. *Journal of Clinical Psychology* 63, 417–424.

- Linehan, M.M., Armstrong, H.E., Suarez, A., Allmon, D., Heard, H., 1991. Cognitive-behavioral treatment of chronically parasuicidal borderline patients. *Archives of General Psychiatry* 48, 1060–1064.
- Linehan, M.M., 1993. *Skills Training Manual for Treating Borderline Personality Disorder*. Guilford Press, New York, NY.
- Linehan, M.M., Heard, H.L., Armstrong, H.E., 1993. Naturalistic follow-up of a behavioral treatment for chronically parasuicidal borderline patients. *Archives of General Psychiatry* 50, 971–974.
- Miklowtitz, D.J., 2008. Adjunctive psychotherapy for bipolar disorder: state of the evidence. *American Journal of Psychiatry* 165, 1408–1419.
- Miller, J.J., Fletcher, K., Kabat-Zinn, J., 1995. Three-year follow-up and clinical implications of a mindfulness meditation-based stress reduction intervention in the treatment of anxiety disorders. *General Hospital Psychiatry* 17, 192–200.
- Rizvi, S., Zaretsky, A.E., 2007. Psychotherapy through the phases of bipolar disorder: evidence for general efficacy and differential effects. *Journal of Clinical Psychiatry* 63, 491–506.
- Scott, J., Garland, A., Moorhead, S., 2001. A pilot study of cognitive therapy in bipolar disorders. *Psychological Medicine* 31, 459–467.
- Teasdale, J.D., Segal, Z.V., Williams, J.M.G., Ridgeway, V.A., Soulsby, J.M., Lau, M.A., 2000. Prevention of relapse/recurrence in major depression by mindfulness-based cognitive therapy. *Journal of Consulting & Clinical Psychology* 68, 615–623.
- Treuer, T., Tohen, M., 2010. Predicting the course and outcome of bipolar disorder: a review. *European Psychiatry* 25, 328–333.
- Weber, B., Jermann, F., Gex-Fabry, M., Nallet, A., Bondolfi, G., Aubry, J.M., 2010. Mindfulness-based cognitive therapy for bipolar disorder: a feasibility trial. *European Psychiatry* 25, 334–337.
- Williams, J.M.G., Alatiq, Y., Crane, C., Barnhofer, T., Fennell, M.J., Duggan, D.S., Hepburn, S., Goodwin, G.M., 2008. Mindfulness-based cognitive therapy (MBCT) in bipolar disorder: preliminary evaluation of immediate effects on between-episode functioning. *Journal of Affective Disorders* 107, 275–279.
- Williams, K.E., Chambless, D.L., Ahrens, A., 1997. Are emotions frightening? An extension of the fear of fear construct. *Behaviour Research and Therapy* 35, 239–248.
- Williams, K.E., 1992. *An Analogue Study of Panic Onset*. Unpublished Doctoral Dissertation. Department of Psychology, American University, Washington, DC.
- Yatham, L.N., Kennedy, S.H., Schaffer, A., Parikh, S.V., Beaulieu, S., O'Donovan, C., MacQueen, G., McIntyre, R.S., Sharma, V., Ravindran, A., Young, L.T., Young, A.H., Alda, M., Milev, R., Vieta, E., Calabrese, J.R., Berk, M., Kyooseob, H., Flávio, K., 2009. Canadian network for mood and anxiety treatments (CANMAT) and international society for bipolar disorders (ISBD) collaborative update of CANMAT guidelines for the management of patients with bipolar disorder: update 2009. *Bipolar Disorders* 11, 225–255.
- Young, R.C., Biggs, J.T., Ziegler, V.E., Meyer, D.A., 1978. A rating scale for mania: reliability, validity and sensitivity. *British Journal of Psychiatry* 133, 429–435.
- Zaretsky, A.E., Sakina, R., Sagar, V.P., 2007. How well do psychosocial interventions work in bipolar disorder? *Canadian Journal of Psychiatry* 52, 14–21.