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A dialectical behavior therapy skills intervention for women with suicidal behaviors in rural Nepal: A single-case experimental design series

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Abstract

1 Background—Suicide in low- and middle-income countries (LMICs) accounts for 75% of the world's burden of suicide mortality and is the leading single cause of death among Nepali reproductive age women. To advance treatment for suicidal behaviors in LMICs, a single-case experimental design (SCED) was conducted of a culturally adapted Dialectical Behavior Therapy skills intervention for Nepali populations (DBT-N).

2 Method—Ten Nepali women with histories of suicidality participated in the 10-session intervention. Outcomes of emotion regulation, suicidal ideation, depression, anxiety, resilience, and coping skills use were measured at multiple time points pre-intervention, during, and at follow-up. Qualitative interviewing assessed DBT-N's feasibility and acceptability.

3 Results—Participants showed improvements in emotion regulation over the course of treatment, which were associated with increased skills use. Rapid, sustained reductions in suicidal ideation and improvements in resilience were observed after DBT-N initiation.

4 Conclusion—This SCED supports conducting further evaluation of DBT-N through controlled trials with emotion regulation as a target mechanism of action for reducing suicidal behaviors in LMICs.

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Suicide accounts for 800,000 deaths annually (World Health Organization, 2014). Globally, 75% of suicide deaths occur in low- and middle-income countries (LMICs), and for every incident of completed suicide, an estimated 20 attempts occur. LMICs in South and East Asia account for the greatest burden of suicide deaths (39%) and have the highest average regional rates (17.7 per 100,000). Nepal exemplifies this regional public health crisis: among women of childbearing age, suicide is the leading single cause of mortality, accounting for over 16% of deaths, with a rate of 28/100,000 (Suvedi et al., 2009).

The World Health Organization (WHO) has drawn attention to the dearth of evidence-based initiatives addressing suicide and nonsuicidal self-injury (NSSI) in LMICs (WHO, 2014). One treatment with strong potential for cultural adaptation and dissemination in resource-strained global mental health contexts is dialectical behavior therapy (DBT; Linehan, 1993a), a skills-based cognitive behavioral therapy with robust empirical support for reducing suicide risk in individuals with complex diagnoses. DBT's underlying theory posits that suicidal behaviors (e.g., suicidal ideation, NSSI, and suicide attempts) result from difficulties regulating emotions or are themselves maladaptive emotion regulation strategies for reducing chronic and intense negative affect. Though the majority of controlled trials using DBT have examined changes in suicidal behaviors in individuals with borderline personality disorder (BPD) or BPD traits (e.g., Carter, Wilcox, Lewin, Conrad, & Bendit, 2010; Harned, Korslund, & Linehan, 2014; Koons et al., 2001; Linehan et al., 1991, 1999, 2006, 2015; McMain et al., 2009; Pistorello, Fruzzetti, MacLane, Gallop, & Iverson, 2012), a number of recent trials have demonstrated the efficacy of standard or skills-only DBT in addressing a wider range of psychopathology (e.g., depression, anxiety, eating disorders) with hypothesized roots in maladaptive emotion regulation (e.g., Goldstein et al., 2015; Hill, Craighead, & Safer, 2011; Neacsiu, Eberle, Kramer, Wiesmann, & Linehan, 2014; Telch, Agras, & Linehan, 2001).

DBT is unique in its potential for cross-cultural application in LMIC settings like Nepal. First, DBT is rooted in Eastern spiritual traditions that align with South and East Asian religious beliefs (Robins & Chapman, 2004). Buddhist practices, such as mindfulness, acceptance, and dialectical truth—foundations for DBT's theoretical development—overlap with Nepali ethnopsychological[1] divisions of the mind, body, and self (Kohrt & Harper, 2008). Second, DBT offers a flexible, contextual, and principle-driven view of behavior that incorporates tailoring of treatment components to clients' unique life circumstances (Hayes, Villatte, Levin, & Hildebrandt, 2011), rendering it amendable to cultural adaptation. Third, DBT's origins in a skills-deficit model and its resulting emphasis on modular skills training via a group setting may encourage delivery of treatment components by paraprofessionals, thereby increasing its ability to be scaled up in resource-poor contexts where poor access to mental health services remains chronic and severe (Singla et al., 2017). Further, DBT's emphasis on treating core, transdiagnostic processes of emotion dysregulation has added value in allowing clinicians to address psychopathology crossing DSM-defined diagnostic boundaries (e.g., Murray et al., 2014).

[1]Ethnopsychology is the study of cultural or "folk" models of psychological subjectivity, and is one salient means of uncovering a culture's own understanding and experience of the self, emotions, physical body, and connections to the social world (Kohrt & Harper, 2008).

Despite this potential, the overwhelming majority of DBT trials have been conducted in western, educated, industrialized, rich, and democratic (WEIRD) settings with limited inclusion of culturally diverse samples. Despite cross-cultural adaptations of DBT with Native American and Latino populations (e.g., Beckstead, Lambert, DuBose, & Linehan, 2015; Germán et al., 2015), these trials were restricted to the United States and lack extensive empirical evaluation. Outside of the United States, virtually no published trials have evaluated the treatment's performance in resource-strained LMIC settings. Further, to the authors' knowledge, no published studies have examined intra-individual changes in programs addressing suicidal behaviors in order to identify potential mechanisms of action. Single-case experimental designs (SCEDs) are one alternative to group-comparison, cross-sectional designs, and may provide a powerful means of identifying these idiographic differences in treatment response (Kazdin, 2003).

The objective of this study was to contribute to the growing call for person-centered psychology (Barlow & Nock, 2009) by evaluating the idiographic performance of a culturally adapted DBT skills training intervention in a low-resource, rural Nepali context. The primary aim was to provide an initial evaluation of culturally adapted DBT skills for Nepali populations (DBT-N; Ramaiya, Fiorillo, Regmi, Robins, & Kohrt, 2017) in reducing psychological distress in low-literacy women with prior histories of suicidality. A SCED was used to identify intra- as well as inter-individual changes in psychological functioning across domains associated with emotion dysregulation, our theorized and target mechanism of change. We hypothesized that DBT-N would result in improvements in individual emotion regulation, and that increases in emotion regulation would predict increases in DBT skills use over time. A secondary aim was to use client semi-structured interviews to provide broader insight into DBT-N's feasibility and acceptability. To the authors' knowledge, this study is the first SCED of a cultural modification of DBT skills training in a non-WEIRD, LMIC setting.

1 METHODS

1.1 Setting

The study was conducted in Jumla, a mountainous and semi-isolated district in northwestern Nepal. Rural Nepal is characterized by poor access to physical health care, high rates of poverty and illiteracy, and negligible mental health services and infrastructure (United Nations Development Programme, 2004). With a population of over 100,000, Jumla has nine health posts and one hospital with five doctors. In 2007–08, following a decade-long civil war, rates of depression and anxiety in Jumla were 40.6% and 47.7%, respectively (Kohrt et al., 2012).

1.2 Design

The present study employed a mixed-methods SCED series following a classic AB design with repeated follow-up. Quantitative measures were assessed at each of the following timepoints: baseline measurements were taken during a wait-list period (A; two weekly time points), followed by weekly measurement following treatment initiation (B; nine weekly

time points), and a follow-up period to assess for sustained trends following termination (one- and four-week time points).

1.3 Intervention

A tri-phasic, iterative approach was employed to culturally modify the standard DBT regimen to develop DBT-N (Ramaiya et al., 2017). DBT-N development was heavily guided by grounded theory methodology and was thus specifically designed for use in Nepal and similar resource-strained, South Asian settings. All intervention content, teaching strategies, and curriculum materials were designed for delivery by lay providers with no prior or formal mental health training, in order to enhance the intervention's dissemination and implementation potential in these contexts. (See Ramaiya et al., 2017 for a comprehensive description of treatment modifications and their underlying rationale.)

The resulting intervention, DBT-N, is a modularized, 10-session group intervention largely derived from the skills training component of standard DBT. Treatment structure was informed by a truncated DBT skills group program developed for survivors of domestic violence in the United States (Iverson, Shenk, & Fruzzetti, 2009). The primary objective of the intervention is to reduce deficits in emotion regulation via increasing acquisition and generalization of skills. Each group session, lasting approximately 180 minutes, parallels standard DBT skills training procedures (See Table 1 for an overview of the curriculum). All sessions begin with a group mindfulness exercise, followed by a behavioral chain analysis in order to identify problem behaviors appropriate for skills training. Chain analysis is then followed by homework review. The remainder of each session focuses on skill-specific didactics and in-vivo behavioral rehearsal of skills from one of the five DBT-N modules (i.e., Mindfulness, Distress Tolerance, Self-Validation, Emotion Regulation, and Interpersonal Effectiveness). Sessions conclude with a homework assignment and skills generalization strategies (e.g., anticipation of internal and external states in which clients use skills, repeated behavioral rehearsal across real-world contexts, involvement of family members in homework completion). A 30-minute lunch break is also provided.

The intervention was delivered in Nepali by two lay providers: one U.S. masters-level student with 20 hours of didactic training in comprehensive DBT but no direct clinical experience, and a local Nepali counselor trained in DBT-N over a five-day period. A U.S. trained psychologist of Nepali origin with DBT expertise provided weekly, remote supervision.

1.4 Procedure

Ten women with current or past histories of suicidal and/or NSSI behaviors were recruited for the study using community-based referrals. All participants were native citizens of the rural Jumla district, were treatment-naïve (i.e., had never received formal inpatient or outpatient mental health services), and met the following inclusion criteria: female between the ages of 18–50 years; a suicide or self-harming attempt within the last two years OR a score of 2+ on Item #9 Nepali version of the Beck Depression Inventory (endorsing that either "I would like to kill myself" or "I would kill myself if I had the chance") (Kohrt, Kunz, Koirala, Sharma, & Nepal, 2002). Exclusion criteria included comorbidity of

psychosis, one or more developmental disorders, and current alcohol or substance dependence.

Outcome baseline measurements were obtained at two- and one-week prior to the intervention. The intervention period consisted of 10 weekly meetings, with measurements taken 3–4 days following the conclusion of each group for sessions 2–10. Follow-up measurements were taken 1- and 4-weeks post-intervention. Due to the high rate of illiteracy, all measurements were taken using interviewer-administered questionnaires conducted by a local research assistant. The trained research assistant was a native Nepali speaker and blind to all treatment content. The same research assistant also conducted individual semi-structured interviews (averaging 60 minutes in length) for qualitative analysis two-weeks post-intervention.

The intervention was provided at no financial cost, and no monetary compensation was provided. Approval for the study was obtained by both the Duke University Institutional Review Board (Pro00052917) and the Nepal Health Research Council, the national body providing ethical oversight for clinical research in Nepal.

1.5 Self-report measurement

All instruments required transcultural adaptation and were modified using a five-step procedure commonly used in LMIC cross-cultural research settings (van Ommeren et al., 1999).

1.5.1 Suicide and self-injurious behaviors—Frequency and severity of suicide attempts and NSSI episodes were measured at baseline using an adapted version of the Suicide Attempt Self-Injury Interview (SASII; Linehan, Comtois, Brown, Heard, & Wagner, 2006). This semi-structured assessment has been used in numerous outcome studies of DBT (e.g., Linehan et al., 1991, 2006, 2015; Pistorello et al., 2012). At follow-up, rates of suicidal and self-injurious behaviors were determined via clinical interviewing rather than standardized measurement. Suicidal ideation was assessed via Item #9 of the Nepali version of the Beck Depression Inventory (BDI; Kohrt et al., 2002).

1.5.2 Emotion regulation—An adapted version of the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) was used to assess multiple areas of emotion regulation, including difficulties in emotion recognition and awareness, lack of emotional clarity, non-acceptance of emotion, difficulties engaging in goal-directed behavior, impulse control difficulties, and limited access to emotion regulation strategies. The 26-item Nepali version was adapted in order to target multiple domains of measurement equivalence and includes 26-items spanning the original six domains. Higher scores indicate greater difficulties with emotion regulation. In this sample, Cronbach's alpha (α) = 0.95.

1.5.3 Coping skills—Changes in skills use were measured using an adapted version of the Dialectical Behavior Therapy Ways of Coping Checklist (DBT-WCCL; Neacsiu, Rizvi, Vitaliano, Lynch, & Linehan, 2010). The Nepali version contains 25 items that can be scored as two subscales that measure the frequency of DBT skills use and dysfunctional coping over the previous week. On the skills use subscale, higher scores indicate greater use of

coping skills. This subscale was used for all analyses in this study. Internal reliability of the Nepali version is good (α = 0.86).

1.5.4 Depression symptoms—Depressive symptomatology was measured using a validated Nepali version of the Beck Depression Inventory (BDI; Kohrt et al., 2002). The 21-item scale assesses depression symptoms over the prior 2 weeks and has high discriminant validity (AUC = 0.919; 95% CI 0.878—0.960) and internal reliability (α = 0.90; Kohrt et al., 2012). A score of 20 or greater indicates the presence of moderate depression (Kohrt et al., 2012).

1.5.5 Anxiety—Anxiety symptomatology was measured using a validated Nepali version of the Beck Anxiety Inventory (BAI; Kohrt, Kunz, & Koirala, 2003). The 21-item scale assesses anxiety symptoms over the prior 2 weeks and has high discriminant validity (AUC = 0.847; 95% CI 0.789—0.906) and internal reliability (α = 0.90; Kohrt et al., 2012). A score of 17 or greater indicates the presence of moderate anxiety (Kohrt et al., 2012).

1.5.6 Post-traumatic stress disorder—Post-traumatic stress disorder (PTSD) symptoms were measured using a Nepali version (Thapa & Hauff, 2005) of the PTSD Checklist, Civilian Version (PCL; Weathers, Litz, Herman, Huska, & Keane, 1993). The 17-item scale corresponds with the Diagnostic and Statistical Manual of Mental Disorders, 4th edition, text revised (American Psychiatric Association, 2000) PTSD diagnostic criteria. A score of 50 or greater indicates need for clinical intervention (Thapa & Hauff, 2005).

1.5.7 Resilience—A 9-item Nepali version of the Resilience Scale (RES; Wagnild & Young, 1993) has been adapted for use in Nepal (Kohrt et al., 2016). The scale identifies the degree to which an individual is able to cope with and respond successfully to life stressors. Higher scores reflect higher individual resiliency. The scale has good internal reliability (α = 0.83; Kohrt et al., 2016).

1.6 Analyses

1.6.1 SCED protocol—A tri-phasic approach was used to analyze data in accordance with standard SCED assessment procedures (Barlow, Nock, & Hersen, 2009; Kazdin, 2003). In phase 1, the first and second authors independently performed case-by-case, visual inspection of performance on all outcome variables. Visual inspection was used to complement linear regressions by identifying trends (e.g., sudden within-case variability, similarities in multi-indicator trends) that may be concealed by statistical methods. Visual inspection followed guidelines proposed by (Barlow et al., 2009; Manolov & Moeyaert, 2017). These include assessment of specific trends both within and between each phase of the AB design: (a) change in trend or symptom level across phases A, B, and follow-up; (b) the degree of change (slope of the graph) between phases; and (c) changes in variability of the data that capture stability of symptom change within phases. Interrater reliability for visual inspection (κ = 0.981) indicated a high level of agreement. Similar procedures have been utilized in evaluations of novel interventions in resource-strained, global mental health settings (e.g., Jordans et al., 2012; Jordans, Komproe, Tol, Nsereko, & De Jong, 2013).

In phase 2, linear regressions were conducted in SPSS (release 24) to examine stability of observed trends in changes per outcome variable, per case. Standardized beta coefficients were estimated using a multiple linear regression model using ordinary least-squares regression. Significant β values (established a cut-off of $\alpha < 0.05$) represented trend stability within cases in either positive or negative directions, and were used to corroborate visual inspection analyses.

In phase 3, group data were aggregated across outcome indicators, and Wilcoxon signed rank tests and effect sizes (r) were calculated for all outcomes. To probe improvements, results from phases 1 and 2 were used to cluster individuals into treatment response subgroups: positive change (26–75%) and no improvement (1–25%). Change was thus defined as significant improvement or deterioration when similar trends are confirmed across all indicators.

1.6.2 Qualitative analysis—Semi-structured interviews with DBT-N participants were used to explore the intervention's feasibility and acceptability. Nine post-intervention interviews were conducted. One participant was not available for qualitative interviewing due to work-related travel. Following Nepali transcription and English translation, interviews were analyzed using a comparative method (Guest, 2012). This method consisted of reading transcripts for content and open-coding transcripts for key themes related to intervention feasibility and acceptability. This iterative process was applied to remaining transcripts until a final set of themes emerged. Qualitative commercial software (NVIVO 9) was used for data management and analyses.

2 RESULTS

2.1 Client characteristics

Demographic information, clinical characteristics, and suicidal behaviors are summarized in Table 2. The sample consisted of 10 women (age 19–47), all of whom were Hindu agriculturalists and primary contributors to their household income. 70% were illiterate. At baseline, all participants were above Nepali clinical cut-offs for anxiety, depression, and PTSD caseness. The average number of lifetime suicide attempts was 2.1.

2.2 Attrition

DBT-N participants had an overall completion rate of 82%, with completion defined as attendance in over 50% of sessions. The attrition rate mirrored Linehan and colleagues' (1991) initial randomized clinical trial of comprehensive DBT, where treatment dropout (defined as missing four or more consecutive individual or skills group sessions) was 16.7%. One participant withdrew from the study after Session 3 due to family concerns regarding stigma related to participation in an intervention addressing suicidality. No participants received additional psychiatric or psychological treatment over the course of the study.

2.3 Outcome analyses

There were no deaths by suicide or documented suicide attempts or self-harming events over the course of the study.

Within- and between-case patterns emerged from visual analyses of individual trajectories (See Figure 1). At baseline, suicidal ideation scores had pre-intervention stability across cases (clients 1, 5, 6, 8, 9, 10), with resilience scores showing similar stability patterns (clients 2, 6, 7). For other indicators, baseline stability was more variable. The same observation held in the follow-up phase.

Visual inspection results of note include: (a) gradual, coinciding improvement on the DERS and DBT-WCCL scores during the intervention phase for a majority of clients (with the exception of clients 2 and 7), with DBT-WCCL scores demonstrating greater variability over time; (b) sharp level changes in resilience scores between baseline and intervention for all clients except 10 (who experienced more gradual gains), with gains stabilizing across all cases except 2, 9, and 6, the last of whom continued experiencing rapid gains throughout the intervention phase; and (c) lack of improvement trends on BDI and BAI across all cases, with the exception of clients 2 and 9 (who experienced gains in one or both indicators). Further, any gains in coping and emotion regulation over the course of treatment were sustained at follow-up, with the exception of client 2, whose DERS scores diminished.

For each case, standardized regression coefficients were calculated for each outcome indicator (Table 3). Based on combined regression analysis with all outcomes, the following subgroups emerged: those demonstrating positive change (clients 1, 4, 5, 6, 9, 10) and no change (clients 2, 7, 8). If outcomes were restricted to emotion regulation, coping skills use, and suicidal ideation, all clients experienced positive change.

2.4 Clinically significant change

Clinically significant change for the BDI, BAI, and PCL was determined by a combined assessment of (a) sufficient improvements in individual post- compared to pre-treatment functioning and/or compared to a normative sample (Jacobson, Follette, & Revenstorf, 1984); and (b) a reliable change index (Jacobson & Truax, 1991). All participants began DBT-N above the criterion necessary for change on all three measures. For the BDI and BAI, clinically significant change was calculated using criterion “c” with comparison to a normed, non-clinical group of Nepalis (Kohrt et al., 2012). For the BDI, eight individuals were classified as recovered and one as improved (client 6). For the BAI, three recovered (clients 2, 5, 9), one improved (client 10), two were unchanged (clients 7, 8), and three deteriorated (clients 1, 4, 7). For the PCL, clinically significant change was calculated using criterion “a” due to the absence of a normed, non-clinical sample for comparison (Thapa et al., 2005). Under these criteria, at post-treatment, six recovered, one improved (client 4), one deteriorated (client 5), and one (client 7) was not classified due to missing data.

Based on clinical cut-offs, at post-treatment, 66.7% of participants no longer scored above the BDI clinical cut-off, 33.3% were below the clinical cut-off on the BAI, and 75.0% of cases fell below the PCL cut-off.

2.5 Aggregated (group-level) treatment effects

To probe treatment effects, Wilcoxon ranked tests were conducted on all outcome measures (See Table 4). There were significant improvements between pre- to post-intervention for five of six outcome measures, with large effect sizes for the DERS, BDI, Resilience, DBT-

WCCL, and suicidal ideation. Changes on the BAI also showed a moderate effect size, though improvements were not statistically significant. Longitudinal analyses using generalized estimating equations (GEE) indicated that changes in DERS scores were predicted by time-lagged DBT-WCCL scores, controlling for pre-lag time point DERS scores, over the course of the study ($\beta = .355$, SE = .133, $p = .008$). Group figures charting progress across all outcomes were also included to supplement findings (See Figure 2). Visual inspection of these data indicates that gains in emotion regulation and coping skills use were gradual and sustained over the course of the study (mirroring GEE results), while improvements in suicidal ideation and resilience were most rapid between baseline and treatment initiation.

2.6 Qualitative findings

2.6.1 Feasibility—All 10 clients reported generally favorable impressions of the intervention (See individual client quotes in Figure 1). A majority cited group bonding and cohesion as main reasons for continuing treatment, indicating that sessions provided an enjoyable and interactive reprieve from clients' regular and often solitary work as agriculturalists.

Interviewer (I): What did you like most about group?

Client (C) 2: I miss everyone. I miss the group leaders when we don't mingle around with them. Yes, if I could go there again I could have learned other things with them, too. I miss being around everyone.

C9: It was very interesting. I enjoyed it. I understood different things and we danced too. I found it good for my heart-mind. My heart-mind was never unhappy with them, when we were together. I wish we women can gather together and talk and share our things and do those activities together again.

A number of clients indicated that being in a group setting encouraged their sense of mastery in interpersonal contexts.

C8: We went there once in a week and I wanted to listen to the good things they taught and I learned that it is good to enjoy and feel good… So I felt good about all these things when we were together. I used to get afraid to speak but after going to training I learned to speak, and now I don't feel scared anymore.

Despite the facilitative role of groups, barriers to attendance also were mentioned by half of clients. Attendance barriers included competing religious events and time needed to travel long distances on a daily basis to collect firewood.

I: Was it easy for you to participate?

C6: Sometimes it was difficult like in days of work, or in holiday season from the months of September through November. But I tried to manage. Sometimes we had work… we had to collect firewood so we couldn't attend. There's no one to do it but us. Women are always worried about their household chores, wherever they go.

2.6.2 Acceptability—Clients endorsed mixed views of family and community perceptions of their participation in the program. Some families were supportive. Others, however, reported concerns that participation in a program that addressed suicidality would endanger family reputations in their small communities. One client's husband forced her to terminate treatment after the third session. Others shared that community members assumed they were receiving financial compensation for participation, and that future participants would expect financial incentives.

I: Did any other people know about you participating in the training?

C8: Yes, they knew about it. At the beginning they were happy about my sessions but later they asked me if I was getting something for going to the sessions as I had to leave all my works to go there. At first they didn't say anything but later they said what does that organization give you, because I went there leaving the household works.

I: Will you suggest that other women and family members to participate in this group?

C4: They won't listen even if I suggest it… they don't understand. They won't listen.

2.6.3 Skills use—Clients shared a range of skills they found particularly helpful throughout the intervention. They enjoyed and recalled mindfulness skills. Many also continued to implement DBT skills consistent with religious activities.

I: Do you still practice any of the skills?

C9: Yes, like watching the flowers blooming and enjoying it. And letting the leaves flow in stream, putting all our worries in leaf of letting it all flow and sail. I understood about that… I still do that and I still want to learn about it. There were small streams and we would let leaf flow in that. When I do these activities, my worries… go away and my mind just focuses. I also worship in the morning and the evening.

C1: We learned different skills like observing, explaining, mindfulness. They showed us some pictures, which helped us realize that everyone goes through pain and sadness. Those parts helped a lot.

C5: First, to concentrate on one thing at a time. If we divert our mind elsewhere then if we cook rice it won't be good and sometimes we might put salt twice in our meal or put chili powder instead of salt. So after attending those sessions I have been able to concentrate well.

C6: I liked the activity we did about looking to God and the activity of practicing wise mind to convince our hearts. And… we learned that we should do one thing at a time rather than doing everything at once.

Barriers to generalizing skills also emerged, and a few clients reported difficulties remembering skills. Others indicated that they were unable to apply skills after the intervention.

C2: I learned many skills there but then I forgot it all. I couldn't go so I learned half of the things and I forgot half of the things.

I: Do you ever use any of the skills?

C2: I didn't use them… These days I haven't used it. I used it when I went there.

2.6.4 Areas for improvement—Despite participating in a DBT orientation session explaining the nature of the treatment, some clients believed the intervention would have a stronger biomedical focus. They felt somatic complaints had not been sufficiently reduced. As a result, many suggested providing supplementary medical treatment for physical symptoms as a means of improving the program.

C2: It would have been good if they had provided some treatment for my heart. I get worried thinking what will happen if my heartbeat stops.

I: If something bad will happen, you mean?

C2: Yes… Sometimes my chest pains a lot and my heart beats fast and my chest pains. When my mother was ill, I could not take care of her because I was sick too, my chest pained a lot during those days.

C7: I have different problems like having cold hands and feet, my head become hot, my body becomes weary and dizzy, my vision becomes unclear, so it would have been good if they could have provided some medical treatment for this. Out children are small and we are poor. What to do?

3 DISCUSSION

This results from this pilot study suggest that a modified DBT skills intervention for low-literacy Nepali women may be helpful in increasing adaptive emotion regulation through use of DBT skills, with potential for reduction of suicidal behaviors. Over the course of treatment, there were no documented suicide attempts or NSSI incidents. This study represents the first systematic evaluation of culturally adapted DBT skills training in a non-WEIRD, LMIC context, and is to our knowledge the first SCED series of DBT skills training as a stand-alone treatment for emotion dysregulation in an illiterate population with a history of suicidality.

The quantitative pattern of results is consistent with expectations that treatment initiation would correspond to reductions in emotion dysregulation and distress-related psychopathology. For all nine treatment completers, gradual improvements in DERS scores were observed both descriptively and statistically over the course of treatment. As hypothesized, these improvements were predicted by increases in skills use over time. Further, any improvements in DBT-WCCL and DERS scores over the course of treatment were sustained at follow-up, with the exception of client 2, whose improvements in DERS scores diminished. Regression analyses indicated more conservative gains in BDI and BAI

scores, with the exception of significant, stable improvements in depression symptoms for one participant (client 1).

Despite this lack of intra-individual improvement in BAI scores, however, pooled data revealed statistically significant improvements in anxiety symptoms. However, DBT-N's effect size for improvements in BAI scores were lower than those reported in trials for various anxiety disorders in WEIRD settings (Dimidjian et al., 2006; Neacsiu et al., 2014; Westbrook & Kirk, 2005). This may be attributed to the somatic nature of BAI items, raising the potential that high BAI scores reflect comorbid medical problems such as under- or untreated diabetes, anemia and micronutrient deficiencies, cardiovascular disease, and infections (Kohrt, Tol, & Harper, 2007). Qualitative data mirrored these quantitative findings. Despite our comparatively high completion rate relative to other trials (e.g., Soler et al., 2009) and high client satisfaction, many clients complained of physical symptoms after treatment. Participants suggested that their somatic concerns (e.g., dizziness, blurry vision, a racing heart, chest pain, overheating, and feeling cold) would be best managed with medical treatment. Referrals for medical evaluation at the time of screening would also be a useful means of eliminating any existence of cooccurring physiological disorder.

Though combined regression analyses for all outcomes grouped a majority of clients into a "positive change" subgroup, three clients (2, 7, 8) fell into the "no change" subgroup. For client 2, this appears to be due to her trending DBT-WCCL change profile ($p = .060$) and the lack of sustained DBT-WCCL gains at 4-week follow-up. Qualitative results supported these results, with client 2 reporting difficulties using skills outside of the session context. Client 8′s DBT-WCCL change profile also trended ($p = .059$) and gains were also not sustained at follow-up. For client 7, all follow-up data were missing.

Though SCED designs often boast high degrees of internal validity (in this case, demonstrating the causal effect of DBT-N), rival explanations for our findings remain. Although results suggest a contributing role of DBT-N skills, it is possible that observed treatment effects resulted from "common" or non-specific factors (e.g., time and attention from group leaders and other DBT-N participants). This view is buttressed by qualitative findings, which indicated that a supportive group environment provided a majority of clients with a source of meaningful social interaction outside of their isolated profession as agriculturalists. Another interpretation is that these non-specific factors were necessary in exerting an initial effect, but not sufficient in maintaining one. It is plausible that, for instance, non-specific factors were responsible for the initial, immediate gains in suicidal ideation and resilience, but that maintenance of gains was facilitated by skills use over time. Use of validated instruments for rigorously measuring non-specific factors in psychological interventions may provide one opportunity for disentangling these competing effects. Such measures have already been developed and implemented in Nepal (e.g., Kohrt et al., 2015) and should be utilized in future evaluations of DBT-N.

Taken together, our pattern of results warrants further evaluation of DBT-N as a transdiagnostic mental health treatment in Nepali settings. In addition to a demonstrated history of suicidal and self-injurious behaviors, our group experienced high levels of comorbidity at baseline, with all completers meeting criteria for a clinical diagnosis of

anxiety, depression, and PTSD. These findings echo data from WEIRD populations, which show that clients with emotion regulation related deficits also exhibit high levels of psychiatric comorbidity (e.g., Neacsiu et al., 2014). At posttreatment, two-thirds of participants no longer scored above the BDI clinical cut-off, one-third were below the clinical cut-off on the BAI, and three-quarters of cases fell below the PCL cut-off.

While results from this small-scale pilot offer promising preliminary support of DBT-N, the findings are not without limitations. Use of a standard design lacking controlled or more rigorous SCED components (e.g., multiple baseline and follow-up measurement, randomization at baseline, use of an alternating treatment group) limit the potential strength of inferences drawn from the current study. Our small sample size also merits cautious interpretation of statistical findings and weakens their validity and generalizability. Our measurement of suicide and NSSI at baseline and over treatment is an additional limitation of note: changes in suicidal ideation were assessed using a single item, and a combination of scheduling difficulties and lack of available clinical interviewers at follow-up restricted structured measurement of suicide attempts and NSSI episodes to baseline only. These barriers limit possible conclusions about DBT-N's efficacy in targeting suicidal behaviors specifically and should be addressed in future trials.

Due to lack of a standardized fidelity or rating tool for DBT-N, treatment adherence and fidelity were not evaluated in this SCED evaluation, leading to potential concerns surrounding the validity of reported inferences. Behavioral measures of clinical competence are increasing in global mental health settings including Nepal (e.g., Kohrt et al., 2015) and could provide a basis for developing a DBT-N fidelity tool. Further, a limited number of therapists conducted the intervention in the sample, one of whom was a U.S.-based graduate researcher with limited didactic DBT training. As the empirical recommendation is the use of paraprofessionals to deliver psychological treatments in LMIC, additional research is needed to assess the generalizability of the intervention across multiple therapists with more limited mental health training.

4 CONCLUSION

This pilot study suggests that DBT-N may be useful as a transdiagnostic treatment among low-literacy Nepali women with histories of suicidality. Participants demonstrated improvements in emotion regulation across the course of treatment, and these benefits were associated with increased use of DBT-N skills over time. Rapid and sustained reductions in suicidal ideation and improvements in resilience were observed for a majority of cases after treatment initiation. The intervention was also feasible and acceptable, demonstrated by both a high retention rate and favorable treatment impressions. Future studies should investigate the extent to which DBT-N skills mediate observed gains in emotion regulation using both multiple single-case as well as group-comparison designs.

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Glossary

BAI	Beck Anxiety Inventory
BDI	Beck Depression Inventory
DBT	Dialectical behavior therapy
DBT-N	Dialectical Behavior Therapy skills for Nepali populations
DERS	Difficulties in Emotion Regulation Scale
HIC	High-income country
LMIC	Low- and middle-income country
PCL	PTSD Checklist
RES	Resilience Scale
SCED	Single-case experimental design
SI	Suicidal ideation
WEIRD	Western, educated, industrialized, rich and democratic

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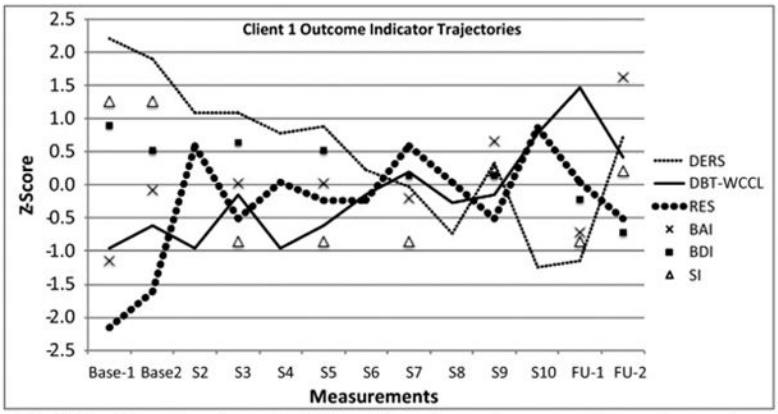
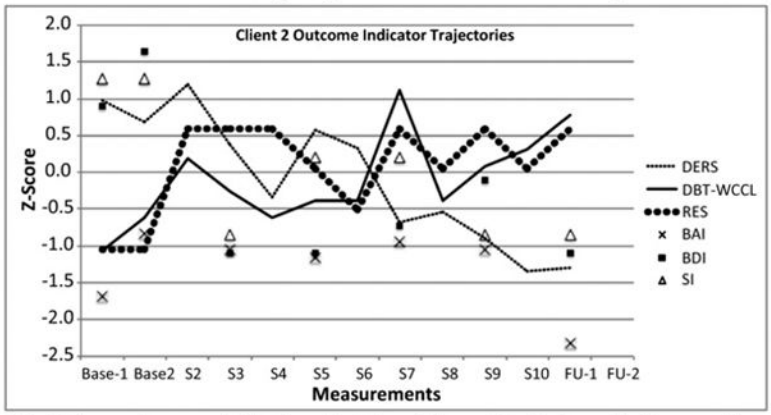
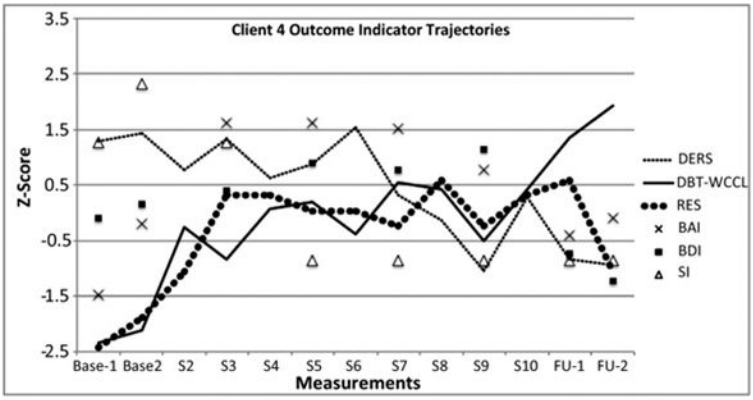


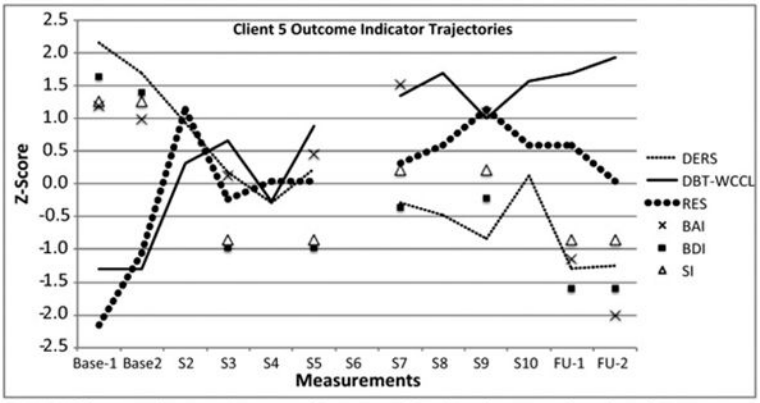
C1: "Yes, [my thoughts of self-harm] has been decreased. I used to work without thinking anything about it but now I give it a thought with my brain-mind and I concentrate on it only so it has been good now… At times when I found it hard to bear stress I did those exercises… They taught us that we will have to try hard to live a good life."



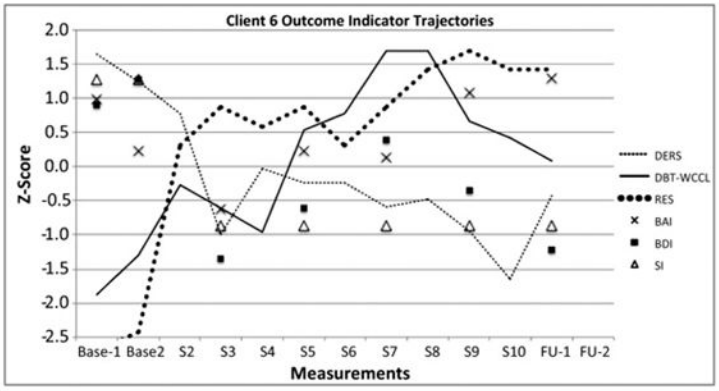
C2: "I learned many skills there but then I forgot it all. I couldn't go so I learned half of the things and I forgot half of the things. I didn't use them [skills]… These days I haven't used it. I used it when I went there."



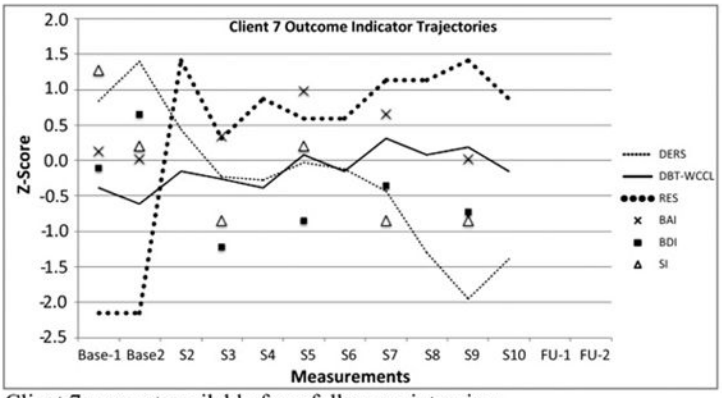
C4: "Anyone with this pain benefit. I had thoughts of suicide before but now I don't have those thoughts. I had negative thoughts but I learned that I shouldn't keep those negative thoughts in me. Should be positive instead."



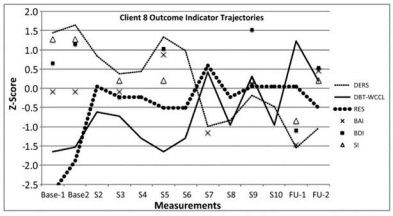
C5: "After coming to these sessions, my fear has been reduced and I can now suggest other women to go if they have similar kind of problems. I can tell them what is wrong and what is right for them to do… now we can speak for ourselves. There is nothing more valuable than our body."



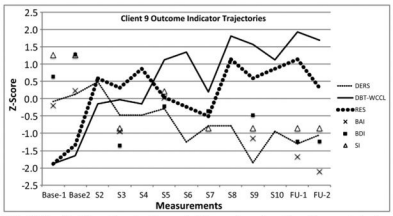
C6: "I also learned that we should eradicate the things that make us worried and should only focus on one thing… but I understood that if we have our mind stuck in something else [while focusing] then it won't work. Also, I learned that we should be content in what we have by not envying what others eat or wear. All these things that I learned are very convincing. I also got knowledge on taking care of my family."



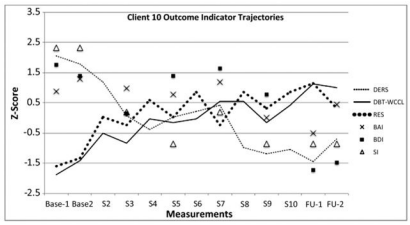
Client 7 was not available for a follow-up interview.



C8: "If I get stressed at home, and when my mind does not work, I look at the handouts. When I am in any conflicts and when I don't want to talk to anyone, I look at them. If I get stressed talking with people and mind doesn't work then I can look at that."



C9: "I like that they involved people like us from low level too, not just people of high level… Even if we are underprivileged we have been able to understand about these things. My problem of thinking too much has vanished away, and I don't feel sad. I don't think of hurting myself again, and I try to convince other women, too."



C10: "I used to get angry often and there's no one who cries as much as me so because of that they [my family] sent me there. Now all of these have decreased these days. I understood what I should do so it has decreased now."

Figure 1.

Individual change profiles (standardized scores)

Note. All instrument total scores were standardized using Z-transformation to allow for visual comparison across individuals.

DERS = Difficulties in emotion regulation scale; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; RES = Resilience Scale; DBT-WCCL = DBT Ways of Coping Checklist, skills use subscale; SI = Suicidal Ideation, Beck Depression Inventory Item #9

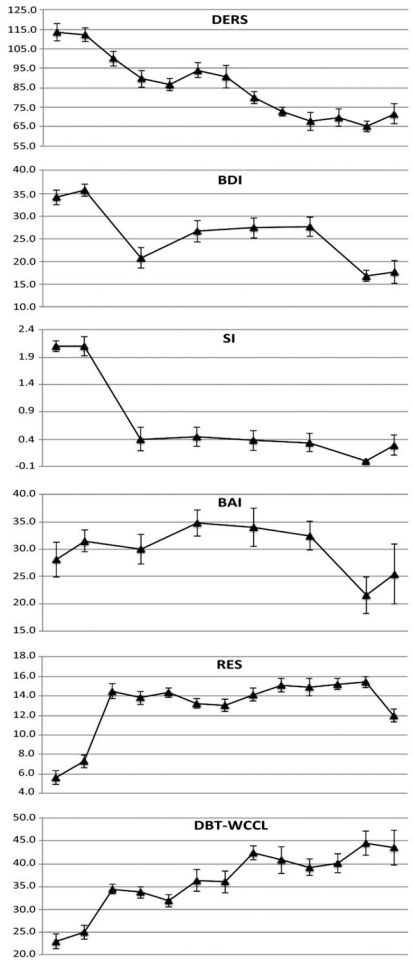


Figure 2.

Group change profiles (raw scores)

*Clinical cut-off scores for caseness validated in Nepal. Beck Depression Inventory (BDI) depression caseness ≥ 20 total score (Kohrt et al., 2002). Beck Anxiety Inventory (BAI) anxiety caseness ≥ 17 total score (Kohrt et al., 2003).

Note. DERS = Difficulties in Emotion Regulation Scale; BDI = Beck Depression Inventory; SI = Suicidal Ideation (Beck Depression Inventory Item #9); BAI = Beck Anxiety Inventory; RES = Resilience Scale; DBT-WCCL = DBT Ways of Coping Checklist

Table 1

Dialectical Behavior Therapy skills for Nepali populations (DBT-N) schedule

Session	Topics covered	Allocated time (min)
Orientation & Pretreatment	Diary card	30
	Contact Information	15
	Treatment Overview	45
	Break	30
	Group Guidelines	20
	Homework: Weekly Diary Card	10
Session Two	Homework Review	15
	Mindfulness *	
	Wise mind	45
	"What" skills	45
	Break	30
	Chain Analysis	25
	Establish Treatment Targets	15
	Homework: Using Breath to Find Wise Mind	5
Session Three	Chain Analysis	25
	Homework Review	15
	Mindfulness	
	Wise mind	45
	Break	30,
	Mindfulness	
	"How" skills	60
	Homework: Practicing "How" Skills	5
Session Four	Chain Analysis	25
	Homework Review	15
	Distress Tolerance *	
	Wise Mind ACCEPTS Skills	45
	Break	30
	Distress Tolerance	
	Self-Soothe Skills	60
	Homework: Practicing ACCEPTS & Self-Soothe Skills	5
Session Five	Chain Analysis	25
	Homework Review	15
	Distress Tolerance	
	Radical Acceptance	45
	Break	30
	Distress Tolerance	
	Radical Acceptance	45
	Homework: Practicing Radical Acceptance	5
Session Six	Chain Analysis	25

Session	Topics covered	Allocated time (min)
	Homework Review	15
	Distress Tolerance	
	Radical Acceptance	15
	Break	30
	Self-Validation	
	Step 1: Awareness of Emotion	45
	Step 2: Normalizing of Emotion	45
	Homework: Noticing Validation Towards Self & Others	5
Session Seven	Chain Analysis	25
	Homework Review	15
	Self-Validation	
	Step 3: Self-Forgiveness	45
	Step 4: Self-Encouragement	30
	Break	30
	Emotion Regulation *	
	Model for Describing Emotions	30
	Homework: Noticing and Responding to Invalidation	5
Session Eight	Chain Analysis	25
	Homework Review	15
	Emotion Regulation	
	Mindfulness of Positive Emotion	25
	Reducing Vulnerabilities	25
	Break	30
	Emotion Regulation	
	Nepali Pleasant Activities	25
	Opposite Action	30
	Homework: Practicing Opposite Action	5
Session Nine	Chain Analysis	25
	Homework Review	15
	Interpersonal Effectiveness *	
	Relationship Effectiveness	60
	Break	30
	Safety Plan Development	45
	Homework: Balancing Priorities in Interpersonal Relationships	5
Session Ten	Chain Analysis	25
	Homework Review	15
	Interpersonal Effectiveness	
	Objectives Effectiveness Skills	60
	Break	30
	Program Recap and Review	30
	Closing	20

* Module derived from first-edition Skills Training Manual (Linehan, 1993b)

Table 2

Baseline characteristics and treatment completion ($N = 10$)

	Participants
Age, mean (SD, range)	30.8 (8.78,19–47)
Female, no. (%)	10 (100)
Married, no. (%)	9 (90)
No. of children, mean (SD, range)	2.2 (1.08, 0–4)
Caste, no. (%)	
Brahman	2 (20)
Chhetri	3 (30)
Dalit	5 (50)
Highest education level completed (%)	5 (50)
None	3 (30)
Primary school	2 (20)
School leaving certificate [a]	
No. of sessions attended, mean (range)	7.9 (3–10)
10 sessions, no. (%)	3 (30)
9 sessions, no. (%)	2 (20)
8 sessions, no. (%)	1 (10)
7 sessions, no. (%)	2 (20)
6 sessions, no. (%)	1 (10)
3 sessions, no. (%)	1 (10)
Current Axis I Disorders	
Depression, no. (%)	10 (100)
Anxiety, no. (%)	10 (100)
Posttraumatic stress disorder, no. (%)	10 (100)
Lifetime suicide attempts, mean (SD)	2.1 (1.4)

[a]The national exam required for admission to upper secondary school in Nepal. Examination occurs at the end of 10^{th} grade.

Table 3

Respondent change indicators from combined visual inspection and regression analyses ($n = 9$)

Case		DERS	BAI	BDI	RES	DBT-WCCL	SI
1	Visual [a]	+	−	+	+	+	+
	Regression [b]	−.835 (.735); .001 *	.825 (.322); .043	−.945 (.166); .004 *	.414 (.246); .205	.838 (.304); .001 *	−.300 (.102); .563
2	Visual [a]	+	+	+	+	+	+
	Regression [b]	−.780 (.608); .005 *	−.530 (.549); .280	−.514 (.930); .297	.299 (.194); .372	.582 (.423); .060	−.655 (.082); .158
4	Visual [a]	+	−	+	+	+	+
	Regression [b]	−.527 (.867); .096	.013 (1.325); .980	−.365 (.755); .476	.530 (.242); .094	.750 (.560); .008 *	−.843 (.084); .035 *
5	Visual [a]	+	+	+	+	+	+
	Regression [b]	−.796 (.556); .006 *	−.452 (1.241); .368	−.613 (.995); .196	.521 (.248); .123	.848 (.454); .002 *	−.393 (.100); .441
6	Visual [a]	+	−	+	+	+	+
	Regression [b]	−.674 (1.076); .023 *	.648 (.668); .164	−.461 (.970); .358	.736 (.288); .010 *	.626 (.700); .039 *	−.655 (.082); .158
7	Visual [a]	+	No change	+	+	+	+
	Regression [b]	−.416 (1.441; .232	.083 (.692); .894	−.378 (.849); .530	.567 (.364); .087	.652 (.197); .041 *	−.671 (.096); .215
8	Visual [a]	+	No change	No change	+	+	+
	Regression [b]	−.760 (.667); .007 *	−.279 (.811); .592	−.148 (.922); .813	.510 (.227); .109	.584 (.586); .059	−.814 (.044); .093
9	Visual [a]	+	+	+	+	+	+
	Regression [b]	−.743 (.513); .009 *	−.808 (.618); .098	−.567 (.815); .241	.516 (.249); .104	.838 (.526); .001 *	−.703 (.080); .119
10	Visual [a]	+	+	+	+	+	+
	Regression [b]	−.772 (.956); .005 *	−.794 (.413); .059	−.646 (1.076); .166	.692 (.186); .018 *	.856 (.336); .001 *	−.777 (.098); .069

[a] Visual inspection of improving post-intervention trend compared to pre-intervention trend. A + indicates an improving trend.

[b] Regression analyses, collapsing pre- and post-time points, after start of the intervention.

* Regression coefficient significant and positive result of visual inspection.

Note. DERS = Difficulties in Emotion Regulation Scale; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; RES = Resilience Scale; DBT-WCCL = DBT Ways of Coping Checklist, skills use subscale; SI = Suicidal Ideation, Beck Depression Inventory Item #9

Table 4

Aggregated outcomes pre- and post- dialectical behavior therapy skills group intervention (n = 9)

Measure	Time point	M	SD	Z^a	Asymp. sig.	Effect size (*r*)
DERS	Pre	113.33	12.63	−2.668	.008	.889
	Post	72.22	15.48			
BAI	Pre	31.06	7.74	−1.244	.214	.415
	Post	25.67	11.04			
BDI	Pre	35.00	4.76	−2.666	.008	.889
	Post	18.39	5.35			
RES	Pre	6.06	1.72	−2.670	.008	.890
	Post	14.50	2.11			
DBT-WCCL	Pre	24.50	4.80	−2.666	.008	.889
	Post	44.67	6.14			
SI	Pre	2.06	0.46	−2.680	.007	.893
	Post	0.22	0.36			

Note. DERS = Difficulties in Emotion Regulation Scale; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; RES = Resilience Scale; DBT-WCCL = DBT Ways of Coping Checklist, skills use subscale; SI = Suicidal Ideation, Beck Depression Inventory Item #9.