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Study of Dialectical Behavior Therapy Versus Cognitive Behavior Therapy on Emotion Regulation and Mindfulness in Patients with Generalized Anxiety Disorder

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Abstract
Although the effectiveness of dialectical behavior therapy (DBT) in the treatment of generalized anxiety disorder (GAD) has not been addressed to date, cognitive behavior therapy (CBT) is the gold-standard psychotherapy for GAD patients. The present study investigated effects of DBT versus CBT on emotion regulation and mindfulness in GAD patients. Conducted in Iran, 68 GAD patients were randomly assigned to one of two groups: CBT or DBT. Assessment was performed at pre-treatment, post-treatment, and at 3 months follow-up. Evaluation included the Generalized Anxiety Disorder scale (GAD-7), Structured Clinical Interview for DSM-IV Axis I disorders (SCID-I), Beck Depression Inventory (BDI-II), Beck Anxiety Inventory (BAI), Five Facet Mindfulness Questionnaire (FFMQ), and Difficulties in Emotion Regulation Scale (DERS). Results of the present study showed that both groups had lower scores in depression, anxiety, and emotion dysregulation and higher scores in mindfulness after the interventions, and at follow-up. During the study period, the CBT group experienced greater reductions than the DBT group in symptoms of depression and anxiety, while the DBT group experienced greater improvements than the CBT group in emotion regulation and mindfulness. Findings seem to warrant the conclusion that, although CBT reduced symptoms of depression and anxiety more than DBT, DBT was more effective in improving emotion regulation and mindfulness than CBT. Findings of the study are of significance for psychotherapy and future studies of these treatments.

Keywords Generalized anxiety disorder · Dialectical behavior therapy · Cognitive behavior therapy · Emotion regulation · Mindfulness

Introduction

Generalized anxiety disorder (GAD) is defined as too much anxiety about multiple activities or events most days and over a period of at least 6 months. This anxiety is hard to control and is associated with symptoms such as irritability, muscle tension, restlessness, and difficulties sleeping. Anxiety is difficult to control, causes intrinsic suffering and disrupts important areas of one's life (Behar et al. 2009a, b). The ratio of female to male in this disorder is about two to one (Kaplan 2016). According to the DSM-V, the most common comorbid disorders associated with GAD are social phobia, specific phobia, panic disorder, and major depressive disorders (APA 2013). One of the main problems for the GAD patients is deficits in emotion regulation.

Impairments in Emotional Regulation (ER) in the GAD patients have been documented, but improvements in this skill as a result of GAD-focused psychotherapy is less documented. Impairments in ER and mindfulness are central to the GAD diagnosis (Salguero et al. 2019; Wells 2002), and can be summarized as poor recognition of emotions, emotional hyper-responsiveness, and difficulties in managing behaviors (Novick-Kline et al. 2005). The ER and mindfulness are associated with the limbic system (Hariri et al. 2000; Stein et al. 2008). More self-determined processes involve prefrontal cortical (PFC) structures, including the hippocampus and the orbitofrontal cortex (Preston and

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Eichenbaum 2013). So far, many treatments have been used for the GAD patients.

The first-line treatment for the GAD is medication, but according to evidence, two thirds of patients still show symptoms of GAD after medication (Majid et al. 2012). Other evidence suggests that medication may have an effect on the reduction physical sensations associated with anxiety, but is not as effective in addressing cognition (Behar et al. 2009a, b).

CBT is a psychotherapy that addresses dysfunctional thinking and behavior in order to alleviate psychological problems (Hofmann et al. 2013). In addressing anxiety disorders, CBT posits that excessive appraisal of threat is a main component underlying abnormal anxiety (Clark and Beck 2010). CBT for anxiety focuses on changing dysfunctional beliefs by using cognitive and behavioral techniques (Wells and Carter 2014). Evidence for the effect of CBT for GAD comes from a meta-analysis and review study that has shown CBT to result in symptom improvement among GAD patients (Cuijpers et al. 2014). However; CBT does not address the wide range of focal worries experienced by GAD patients, which reduces treatment efficacy (Hoyer and Gloster 2009), and the effect of CBT on GAD is less than that of CBT on other anxiety disorders (Fisher and Durham 1999; Newman et al. 2008; Westen and Bradley 2005). In addition, GAD is not easily treated with CBT, as the source of the anxiety in people with GAD is ambiguous, and the worries in GAD patients often cover extensive issues. CBT also involves a number of interventions focusing on anxiety, and the literature does not differentiate which components are most important in treatment (Salters-Pedneault et al. 2006).

DBT is an emotion regulation based psychotherapy that was initially used to treat Borderline Personality Disorder (BPD), a condition that often involves suicidal and self-harming thoughts and behaviors (Linehan 1993). The main focus in DBT is to teach patients skills to manage their emotions (Linehan 1993; Gross and Thompson 2007). Strategies and skills in DBT have not been studied in the treatment of GAD, but documents suggest that these strategies may be useful in emotion regulation-based disorders like GAD (Boritz et al. 2018). The use of DBT has been expanded to other psychiatric disorders, including eating disorders, substance-related and addictive disorders, post-traumatic stress disorder (Van Dijk 2013), and bipolar disorder (Afshari et al. 2019a). With the increasing utility of DBT, it is important to assess how this psychotherapy may be useful in patients diagnosed with GAD. However, the efficacy of DBT in treating GAD has not yet been studied. People with GAD have traits such as severe emotional responses and reactions, limited understanding of emotional experiences, inability to provide consistent coping strategies, and severe emotional response, as well as emotion dysregulation (Marganska et al. 2013; Wells 2004). Evidence

suggests that DBT can have a beneficial effect on improving emotional regulation (Eisner et al. 2017).

The ER is essentially just that ability to control and influence the emotions that you have, including when you have them, how you're experiencing them, and how you're expressing them. The DBT is one of the treatment related to emotion regulation, but the difference of this treatment with the emotion regulation therapy is that it is more widespread than the treatment of emotion regulation and it emphasizes the emotion regulation, as well as mindfulness, distress tolerance, and interpersonal relationships, while Emotion Regulation therapy only emphasizes the emotions and regulation of them. Results of an emotion regulation therapy on GAD patients demonstrate improvement in rumination, worry, GAD severity, quality of life, social disability, attention flexibility, decentering/distancing, reappraisal, negative emotionality, and trait mindfulness (Renna et al. 2018). Also, in understanding and treating mental disorders, GAD is considered an emotion dysregulation disorder (Turk et al. 2005). The present study compared DBT to CBT in GAD patients.

Materials and Methods

Participants

The study (IRCT2017031233023N1) was approved by the Research Deputy of Kashan University of Medical Science (KAUMS). Informed consent was obtained from each participant. This study was a randomized control trial (RCT) in which sixty-eight out-patients diagnosed with GAD who referred to Kargarnejad Hospital (a psychiatric hospital located in Iran) between February 2018 and January 2019, were randomly allocated to one of two groups: the DBT group or the CBT group, for a total of 34 patients in each group. The setting was outpatient. All patients had the same opportunity to participate in two groups. Patients who were allocated to the two groups completed 16 sessions. All GAD patients were diagnosed by an expert psychiatrist. Inclusion criteria for this study were the presence of GAD, level of education higher than the eighth grade (because of perform the questionnaires correctly), aged 18–45 years old, and having had no preceding psychotherapy for at least 6 months prior to the present study. Excluded criteria were showing one of the severe physical illness, and serious neurological disorders. The therapy processes are shown in Fig. 1.

Interventions

Cognitive Behavior Therapy

The CBT protocol was extracted from the Covin et al. (2008). The 16, 1-h individual CBT sessions focused on
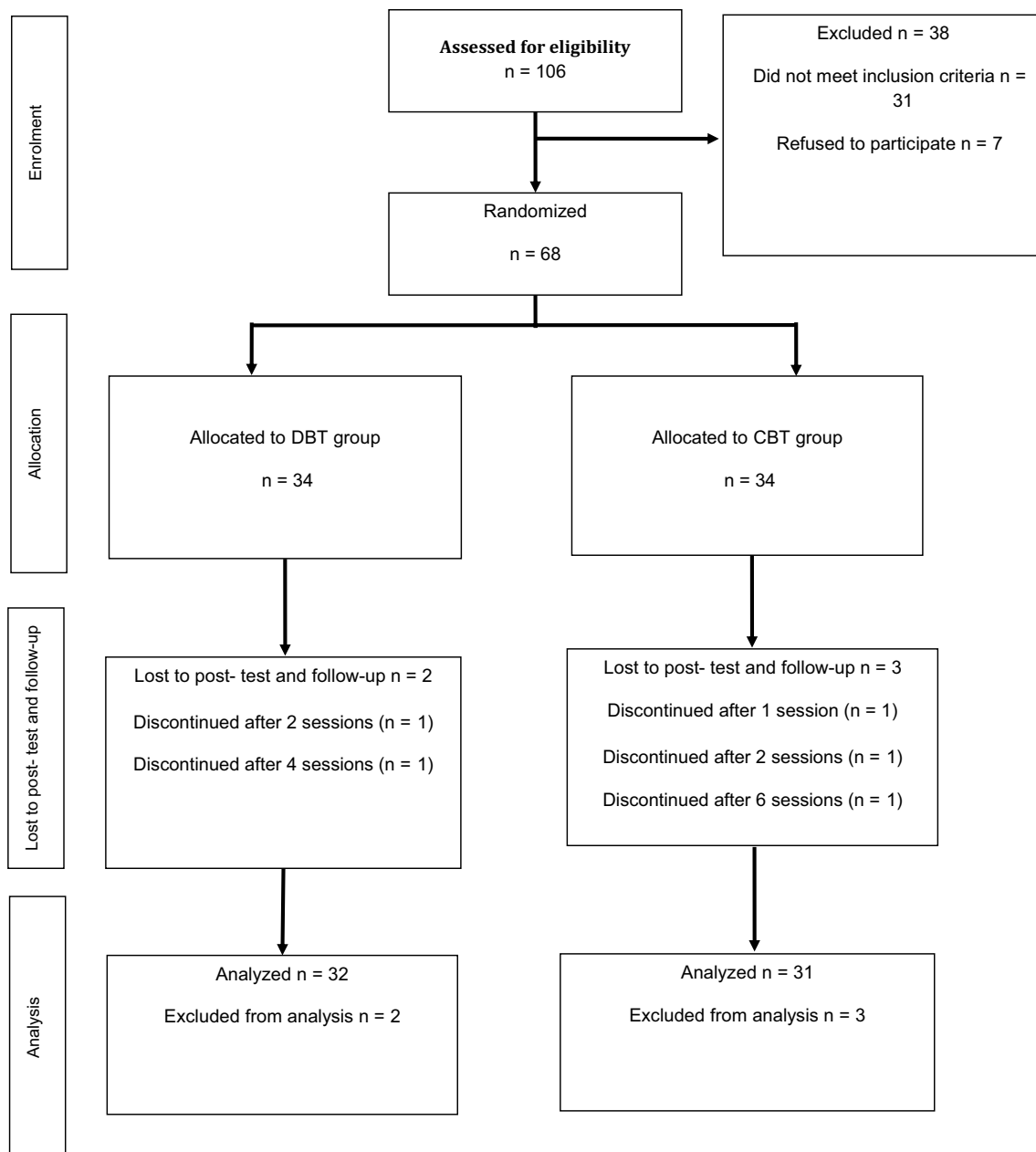
Fig. 1 Participant flowchart

Psychoeducation, relaxation strategies, cognitive strategies, and behavior therapy skills. Sessions 1–4 were allocated to psychoeducation, including introduction to the therapy, identifying GAD-related problems, and defining GAD. Sessions 5–6 consisted of relaxation strategies. Sessions 7–10 consisted of cognitive skills training. Finally, sessions 11–16 included behavior therapy strategies. Each session including review of the previous session and assignment of homework between sessions. Also, treatment itself was in an individual format and "groups" meant treatment conditions.

Dialectical Behavior Therapy

The DBT-informed individual therapy psychotherapy sessions for GAD were based on the standard DBT manual (Linehan 2014). Also, treatment was in an individual format and "groups" meant treatment conditions. The 16, 1-h individual DBT sessions focused on emotion regulation, distress tolerance, interpersonal effectiveness, and mindfulness skills to improve ability to manage crisis situations and self-control. The standard treatment focuses on providing general information about emotions and teaching skills to

help people manage emotions more effectively. The sessions also included mindfulness skills to help people tolerate painful emotions and interpersonal effectiveness skills to help participants develop healthier relationships.

Therapists

The psychotherapists conducting the individual sessions with study participants were two experienced psychologists; both had been trained in DBT and CBT (3 years of training and supervision in DBT and CBT). The therapists received supervision from two professional psychologists throughout the study. All sessions were reviewed by the supervisors.

Measures

Demographic Information

Demographic information such as gender, age, number of hospitalizations, age at diagnosis, years of education, comorbidity with other disorders, psychotherapy history, and age at first hospitalization was gathered using the Demographic Questionnaire.

Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I)

The SCID-I is a widely used structured interview for the presence of Axis I Disorders. The SCID-I has a screening form consisting of 24 items evaluating symptoms for Axis I disorders (Lobbestael et al. 2011; Afshari et al. 2019b, c) and has demonstrated appropriate psychometric characteristics in the Iranian (Persian) population. Diagnostic agreements between test and retest SCID-I administration were fair to good for most categories. Overall kappa was 0.52 for current diagnosis and 0.55 for lifetime diagnosis. Specificity values for most mental disorders were high (> 0.85); the sensitivity values were lower (Sharifi et al. 2009).

Generalized Anxiety Disorder Scale (GAD-7)

This scale was designed by Löwe et al. (2008) and has seven questions, each of which addresses the psychological problems of the subject over the past 2 weeks. The range of this scale is 0 to 21. The authors reported Cronbach's alpha coefficient and the retest coefficient of this questionnaire of 0.92 and 0.83, respectively (Löwe et al. 2008). The correlation coefficient of the anxiety questionnaire with the Beck Anxiety Inventory was 0.77, and with the psychological check list of 90 questions was 0.74. An Iranian study showed that Cronbach's alpha coefficient was 0.85 (Naeinian et al. 2011).

Beck Anxiety Inventory (BAI)

The Beck Anxiety Inventory is a 21-item self-report scale developed to assess for anxiety. The scores range from 0 to 63, with a score of 8–15 considered being mild anxiety, a score of 16–25 demonstrating medium anxiety, and a score of 26–63 considered to be high anxiety (Ulusoy et al. 1998). In a healthy Persian population, the internal consistency of the BAI using Cronbach's alpha ranged from 0.88 for all factors (Khesht-Masjedi et al. 2015).

Beck Depression Inventory (BDI-II)

The BDI-II is a 21-item self-report scale developed to evaluate depression. The scores range from 0 to 63, with a score of 10–19 considered to be mild depression, a score of 20–28 considered medium depression and a score of 29–63 indicating high depression (Whisman et al. 2000). In a healthy Persian population, the internal consistency of the BDI-II using Cronbach's alpha ranged from 0.58 to 0.79 for all subscales. Internal stability of the test in the Persian community was 0.87 and its reliability was estimated 0.73 (Meygoni and Ahadi 2012).

Difficulties in Emotion Regulation Scale (DERS)

The DERS is a 36-item questionnaire for evaluating emotional dysregulation. Individuals answer on a 5-point Likert scale ranging from 1 (never) to 5 (always). High scores indicate higher level of difficulty in regulating emotions (Bardeen et al. 2012). The DERS demonstrated adequate construct and good test–retest reliability. In a healthy Persian population, the internal consistency of the DERS using Cronbach's alpha ranged 0.66–0.88. Also, the internal stability of the test in the Persian community was 0.82 and its reliability was estimated 0.68 (Khanzadeh et al. 2012).

Five Facet Mindfulness Questionnaire (FFMQ)

The FFMQ is a 39-item scale for the assessment of mindfulness. Individuals answer on a 5-point Likert scale ranging from 1 (never) to 5 (always), with high scores demonstrating high level of mindfulness. The FFMQ has shown adequate construct validity and test–retest reliability (Baer et al. 2008). In a healthy Persian population, the internal consistency of the FFMQ using Cronbach's alpha ranged 0.55–0.83 (Heydarinasab 2013).

Statistical Analyses

After using *SPSS 20* to run analyses, the nominal variables of the groups including gender and comorbidity with other disorders were compared using the Chi-square

test. Analysis of variance (ANOVA) was used to compare means of education, age, GAD-7, BDI-II, and BAI. Analysis of repeated measure was used to compare the DBT and CBT study groups at pre-test, post-test, and at the 3-month follow-up.

Results

Descriptive Statistics

The sample included 40 Persian women and 28 Persian men. The DBT study group included 21 women (62%) with an age range of 18–38 years (M = 27.04, SD = 6.07). The CBT study group included 19 women (56%) with an age range of 20–45 years (M = 28.17, SD = 5.12). There were no differences in participants between the two study groups. Thirty-two of the DBT subjects and 31 of the CBT subjects completed the study. The majority of participants had comorbid disorders: panic disorder (n = 11), major depressive disorder (n = 14), and substance use disorder (n = 7). Twenty-six of the 68 study subjects had previously engaged in psychotherapy but not within 6 months of the

current study. Demographic and clinical characteristics are presented in Table 1.

Anxiety Symptoms

The distribution of scores for the measures at pre-test, post-treatment and follow up, with tests for differences between two groups, are demonstrated in Table 2. In general, GAD-7 and BAI scores decreased over time for both study groups, indicating a reduction in anxiety severity at 3 months post-intervention and nearly remained at 3 months follow-up. During this time the CBT subjects made more progress than the DBT subjects (see Table 2 for all results).

Depression Symptoms

Depression symptoms reduced over time for both study groups after the interventions and fairly remained after 3 months follow-up. During the intervention, the CBT subjects made more progress than the DBT subjects (see Table 2 for all results). Although participants in the CBT study group at baseline had average symptoms level, they had minimum symptoms level after the intervention.

Table 1 Demographic features of the sample

Characteristics	DBT group (n = 34)	CBT group (n = 34)	Statistics
Mean age (SD)	27.04 (6.07)	28. 17 (5.12)	16.2^{F}
Number of female patients	62% (n = 21)	56% (n = 19)	1.6^{χ^2}
Marital status (single/married/divorced or separated)	n = 15/17/2	n = 13/18/3	1.1^{χ^2}
Mean years of education (SD)	11.08 (2.02)	10.42 (2.05)	23.5^{F}
Mean age at diagnosis (SD)	21.09 (7.02)	20.26 (6.22)	2.2^{t}
Number with comorbid diagnoses (%)	65% (n = 22)	62% (n = 21)	1.4^{χ^2}
Number with previous engagement with psychotherapy (%)^{t}	41% (n = 14)	35% (n = 12)	1.2^{χ^2}

F F value, *t* t value, χ^2 chi square value

Table 2 Descriptive statistics for the measures over the three time periods assessed in this study by condition

Measure	DBT group (n = 32) Mean (SD)			CBT group (n = 31) Mean (SD)		
	Pre-treatment	Post-treatment	Follow-up	Pre-treatment	Post-treatment	Follow-up
GAD-7	18.65 (7.19)	12.83 (3.45)*	13.53 (3.32)	17.49 (7.42)	6.54 (6.66)*	8.49 (7.35)
BDI-II	13.63 (5.87)	8.35 (3.38)*	9.84 (4.37)	12.46 (5.45)	6.28 (5.63)**	8.63 (5.64)
BAI	32.65 (7.19)	14.68 (3.50)*	16.57 (3.73)	30.39 (7.47)	8.57 (6.96)*	13.39 (7.47)
DERS	98.82 (30.75)	62.17 (14.32)**	67.72 (11.24)	102.2 (21.71)	84.14 (23.24)*	91.48 (22.6)
FFMQ	101.23 (9.15)	135.56 (8.37)**	124.72 (5.31)	104.51 (5.70)	123.71 (6.21)**	112.78 (7.21)

GAD-7 Generalized Anxiety Disorder Scale, *BDI-II* Beck Depression Inventory–II, *BAI* Beck Anxiety Inventory, *DERS* Difficulties in Emotion Regulation Scale, *FFMQ* Five Facet Mindfulness Questionnaire

Post-hoc tests compared pre-test to post-test and post-test to follow-up

*p < 0.05, **p < 0.01

Results of Emotion Dysregulation

The MANOVA showed that residual scores produced by all subscales of the DERS (including impulse, non-acceptance, awareness, strategies, goals, non-acceptance, and clarity) improved over time for both study groups, indicating lasting improvement in ER for participants in the intervention conditions. The DBT group did more vary over the post-treatment than those in the CBT group. Also, this change was maintained at 3 months follow-up.

Results of Mindfulness

Mindfulness scores improved over time for both study groups, indicating improved mindfulness after the intervention and at follow-up (Table 2). Also, differences between groups in subscales of FFMQ, including non-reactive items and awareness, were significantly different, with the exception of the description, non-judge, and observe items. After the DBT intervention, all subscales improved more than in the CBT group. Also, these changes were maintained at 3 months follow-up.

Discussion

Both DBT and CBT are effective psychotherapies to deal with psychological problems. This is the first study comparing DBT and CBT on ER and mindfulness in GAD. We aimed to study the effects of DBT and CBT on depression and anxiety symptoms, emotion regulation, and mindfulness in GAD. Our results indicated that all of these features changed for participants in the two study groups. Attrition from psychotherapy studies in general suggests that the two proposed psychotherapies are not effective for participants experiencing severe symptoms (Kerns et al. 2013; Van Dijk 2013). However this did not appear to be the case in the present study, as the patients who did not complete the study were in a stable state and not unique in the symptoms severity. We suggest two possibilities for why they did not completed the study; previous, unsuccessful engagement with psychotherapy; and negative attitude towards psychotherapy.

The results of the present study indicate an improvement in emotion regulation strategies for patients in the DBT and CBT conditions, and all subscales improved more after intervention in the DBT than the CBT group. The ability to regulate emotions improves as one gets older (Gross and Thompson 2007). It is feasible to teach adults the skills to regulate emotions they didn't learn as children. In sum, ER skills are a basic principle in beginning and maintaining adaptive behaviors, as well as preventing negative behaviors and emotions (Garnefski et al. 2001). So far, no research has been done on the effectiveness of

DBT to treat GAD. Because DBT is a psychotherapy based on regulating emotions, we mention the latest research on the effects of emotional regulation-based psychotherapies in GAD. Renna et al. (2018) examined a sample of 31 GAD young adults who completed 16 sessions of emotion regulation therapy. The results indicate ameliorative changes in rumination, worry, social disability, self-reported and clinician-rated GAD severity, quality of life, decentering/distancing, attention flexibility, reappraisal, negative emotionality, and trait mindfulness from pre- to post-test. These changes were maintained throughout a 3- and 9-month follow-up. As mentioned in the introduction, emotion regulation is one of the components of DBT. In the present study, we also observed changes in emotion regulation by using DBT. Emotion regulation techniques, whether used as a separate treatment protocol or as part of a treatment such as DBT, can have beneficial effects, and it is better to use other techniques such as mindfulness and interpersonal techniques to see more and varied effects for mental disorders.

The results of the present study indicate an improvement in mindfulness strategies for patients in the DBT and CBT conditions, and all subscales improved more after intervention in the DBT than the CBT group. Mindfulness techniques teach individuals to improve thoughts and behaviors, and increase awareness of their emotions, thus improving the level of ability to control emotions (Friese et al. 2012). Teaching mindfulness strategies to patients with GAD can help them adopt more effective skills for emotional regulation. When emotions appear in the form of thoughts at the same time as physical sensations, if one learns to stay in this condition with physical sensations, one's emotional responsiveness could be reduced. Mindfulness helps individuals to improve self-regulation by helping them learn to tolerate their inner experiences before being subjected to stress-inducing stimuli. Since mindfulness is a key component of DBT (Wagner et al. 2006), it seems rational that DBT can affect mindfulness in GAD. The basic hypothesis underlying mindfulness is that experiencing the present moment non-judgmentally can effectively counter the effects of stressors, because excessive tendency toward the past and future when dealing with stressors can be related to anxiety (Kabat-Zinn 2003).

This study had some limitations. A clear challenge was keeping patients engaged with the sessions and their homework. Another limitation was the small sample size, and we suggest future studies with larger sample sizes. Also, patients who participated in the present study had a long history of disorder. Therefore, we may not be able to generalize the results of this study to patients who have experienced a shorter period of their disorder. Finally, we note that this study was conducted in Iran and, whilst further research outside of the typical western psychiatric settings is needed,

generalization of our results to other cultures should be done with caution.

Conclusion

This is a randomized controlled trial comparing individual DBT to CBT sessions in individuals with a diagnosis of GAD. Findings seem to warrant the conclusion that, although CBT reduced symptoms of depression and anxiety better than DBT, DBT was more effective in improving emotion regulation and mindfulness than CBT. Results of this study are of importance for future research in psychotherapy for GAD patients. Future studies are needed to examine the effects of other therapies for GAD. In addition, DBT and CBT strategies could help other mental disorders characterised by impairments in emotion regulation and mindfulness.

Compliance with Ethical Standards

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