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Dialectical Behavior Therapy and Emotion Regulation Changes in Patients with Borderline Personality Disorder in Delta Region of Egypt

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Background: Researchers have proved the role of dialectical behavior therapy (DBT) in improving emotion regulation skills in patients with borderline personality disorder (BPD). Further researches for its effect in different cultures was needed. The current study aimed to examine the effectiveness of DBT relative to treatment as usual "TAU" in improving emotional regulation in BPD patients of the delta region of Egypt.
Subjects and Methods: We conducted a prospective, comparative, non-randomized study. Eligible patients were assigned at their convenience or according to the immediate availability of treatment slots to a comprehensive DBT program integrating DBT skills into skills training schedule or treatment as usual (TAU). Patients were assessed at baseline, and follow up assessment at 4, 8, 12, and 16 months was done using the Arabic version of, Difficulties in Emotion Regulation Scale (DERS),
Results: DBT patients showed better and lower scores of emotion regulation and distress

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tolerance scales in comparison to TAU. Overall, these positive outcomes were maintained in follow-up for four months post-treatment year.
Conclusions: We provide the superior efficacy of DBT in improving emotion regulation in delta region's patients with BPD in comparison to TAU.

Keywords: Borderline personality disorder; bidirectional behavioral therapy; emotion regulation; psychometric parameters; interventional study.

1. INTRODUCTION

Borderline personality disorder (BPD) is characterized by severe cognitive, behavioral, and emotional dysregulation, impulsivity, identity disturbance, problematic interpersonal relationships, and suicidal / self-injurious behaviors. It is a life-threatening disorder with high morbidity and mortality [1]. Borderline personality disorder (BPD), also known as an emotionally unstable personality disorder (EUPD), is a long-term pattern of unstable sense of self, and emotions. People may also struggle with a feeling of emptiness and a fear of abandonment [2].

BPD is the most prevalent personality disorder in all clinical settings (12% to 15%). It is believed to occur in 2% to 3% of the general population, with a 2: 1 female-to-male ratio [3].

Linehan's biosocial theory for the development of BPD postulates that it is originally a disorder of pervasive emotional dysregulation resulting from a transaction between biologically determined "emotional vulnerability" and aversive environmental factors which she described as 'invalidating environment. Emotional vulnerability, according to Linehan, is characterized by three main features: hypersensitivity to emotionally salient stimuli, emotional hyperarousal and slow return to baseline [4].

On the other hand, an "invalidating environment" is an environment that shows intolerance to the expression of personal emotions, especially those without visible component. Invalidating environment reinforces emotional expression intermittently, leading to failure to identify emotions accurately and fails to teach the person effective emotional modulation strategies. Since this theory was initially developed during treatment development efforts, it focused mainly on the "emotional regulation skill deficit" model, hence introduced dialectical behavior therapy "DBT" skills as a solution [5].

Despite the high rate of comorbidity and the major impact on patients suffering from BPD with co-morbid SUD, data regarding treatment outcomes for this group of patients is still scarce.

Dialectical Behavior Therapy "DBT" is an empirically-validated, comprehensive psycho-social treatment for severely dysfunctional women who meet the criteria for Borderline Personality Disorder (BPD), developed by Linehan and her colleagues for over a decade at the University of Washington [6]. DBT assumes that BPD represents a breakdown in normal functioning and that this disorder is best conceptualized as n systemic dysfunction of the emotion regulation system.

Emotional vulnerability is defined by three characteristics: 1) high sensitivity to emotional stimuli, 2) intense response to emotional stimuli, and 3) slow return to emotional baseline once emotional arousal has occurred. Whereas emotion regulation can a) inhibit inappropriate behavior related to strong negative or positive affect, b) self soothe any physiological arousal that the strong effect has induced, c) re-focus attention. and d) organize themselves for coordinated action in the service of an external goal. One of the main goals of DBT is to cultivate conscious emotion regulation, which may be a later automatic response when skills are integrated into client's behavioral paradigm [5].

International guidelines do not usually recommend pharmacotherapy for BPD. The last decade has witnessed tremendous developments in the therapy of BPD, including dialectical behavior therapy (DBT), mentalization-based treatment (MBT), transference-focused therapy (TFP), and schema therapy (ST) [7]. DBT is an out-patient-based modality that relies on the features of cognitive-behavioral principles; the current body of evidence demonstrated significant efficacy of DBT for the management of BPD [8].

Nonetheless, the efficacy of DBT in developing countries, such as Egypt, has not been well characterized yet, and the available literature is

limited, which creates an urgent need for further clinical investigations. Therefore, we conducted this interventional study to evaluate the efficacy of DBT in Egyptian patients with BPD.

2. METHODS

This comparative, non-randomized study was conducted on forty patients (all females). Participants were patients diagnosed with borderline personality disorder according to Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria [1]. They were collected from inpatient and outpatient clinics of the Neuropsychiatry Department and Psychiatry, Neurology and Neurosurgery Center Tanta University Hospitals. The study obtained the ethical approval of the local ethics committee of Tanta University Hospitals prior to the enrollment of the first patient. All patients, or their first-degree relatives, singed the informed consent before their participation.

2.1 Inclusion Criteria

1. Age 18-45 years.
2. Both genders.
3. Diagnosis of current borderline personality Disorder according to DSM-5.

2.2 Exclusion Criteria

1. Patients with current psychotic disorders: schizophrenia and any other psychotic disorder.
2. Intellectual disability and autistic spectrum disorders.
3. Organic disorders: Neurological or other medical diseases.
4. Inability to provide informed consent e.g. delirium.

Eligible patients were assigned at their convenience or according to the immediate availability of treatment slot to comprehensive DBT program integrating DBT skills into skills training schedule or treatment as usual (TAU). Patients assigned to DBT group were included in the program for one year. They received once-weekly individual psychotherapy sessions (one hour), skills training group (2 hours), and skills coaching phone calls with the primary therapist when needed. A weekly team meeting for all DBT therapists was conducted to reduce therapist burnout and increase therapist capabilities to treat these patients.

The following techniques and tools were used at the base line the Semi-structured interview questionnaire to collect Sociodemographic data as age, sex, residence, educational level, marital status, and occupation—medical, psychiatric and drug history. Data were collected at the baseline visit: age, sex, residence, educational level (SCID-II) [9], the Arabic version of the Structured Clinical Interview co-morbid psychiatric disorders as determined by the Arabic version of the Structured Clinical Interview DSM-IV (SCID-I) [10], and for psychometric assessments. The Arabic version of Difficulties in Emotion Regulation Scale (DERS) was used in the assessment of emotion regulation at baseline, 4, 8, 12, and 16 months of treatment [11].

2.3 Statistical Analysis

Data were analyzed using the statistical package of social science (SPSS, windows version 24). All continuous quantitative data were presented in mean and standard deviation (SD). At the same time, categorical data were presented in frequencies and percentages. Chi-square or Fisher Exact tests were used to test the hypothesize of significant difference in categorical variables. While Student t-test, Mann-Whitney test, and One-Way ANOVA were used to test the hypothesize of significant differences in continuous variables. The significance of the obtained results was judged.

3. RESULTS

This study was conducted on 40 patients with co-morbid BPD and assigned at their convenience or according to the immediate availability of treatment slot either to Group-I receiving comprehensive DBT (n=18) or Group-II receiving treatment as usual “TAU” (n=18).

3.1 Demographic Characteristics

Both groups were females with no significant difference between age groups (mean age of 23.90 ± 4.88) for the DBT group and (24.00 ± 4.88 for the TAU group.

The sample was balanced with no significant difference between DBT group and TAU group regarding age, sex (all were females), marital status, work, education or past history of chronic medical conditions (e.g., Diabetes Mellitus, hypertension, cardiac problems) (Table 1).

Table 1. Comparison between the two studied groups according to demographic data

Variables	DBT (n = 18)		TAU (n = 18)		p
	No.	%	No.	%	
Age					
Min. – Max.	17.0 – 33.0		17.0 – 33.0		tp= 0.852
Mean ± SD.	23.90 ± 4.99		24.00 ± 4.88		
Median	24.0		24.0		
Marital Status					
Single	15	83.3	13	72.2	MCp=
Married	2	11.1	3	16.6	0.684
Divorced	1	5.5	2	11.1	
Work					
Student	8	44.4	8	44.4	MCp=
Employed	8	44.4	8	44.4	0.645
Un employed	2	11.1	2	11.1	
Education					
High School	8	44.4	8	44.4	MCp=
Undergraduate	8	44.4	9	50.0	0.632
Postgraduate	2	11.1	1	5.56	
Family history of psychitric					
Yes	8	44.4	7	38.8	□2p =
No	10	55.55	11	61.11	0.125
Family history of PBD					
Yes	7	38.8	6	33.33	□2p =
No	11	61.11	12	66.6	0.583

χ2p: Value for Chi-square test, FEp: Value for Fisher Exact for Chi-square test, MC: Monte Carlo for Chi-square test, tp: Value for Student t–test

3.2 Comparison between the Two Studied Groups According to Current Psychiatric History

Psychiatric comorbidities that was detected by psychiatric interview and mental state examination followed by Arabic version of he Mini-International Neuropsychiatric Interview (M.I.N.I.) or Structured Clinical Interview (SCID-I,II) included mood disorders anxiety disorderspost-traumatic stress disorder (PTSD), obsessive compulsive disorder (OCD), adult attention deficit hyperactive disorder (ADHD) and eating disorders (one case suffering from bulimia nervosa in the DBT group and one case suffering from anorexia nervosa in the TAU group).

Four patients from the DBT group had co-morbid personality disorder other than BPD (2 cases with a histrionic personality disorder, one with narcissistic personality disorder and one with antisocial personality disorder). In comparison, six patients of the TAU group had another personality disorder (4 suffering from a histrionic personality disorder, one with co-morbid and obsessive personality disorder and one with antisocial personality disorder) with no significant difference in between the two groups.

There was no significant difference between DBT group and TAU group regarding the mean number of hospital admissions (Table 2).

3.3 Comparison between the Two Studied Groups According to Current Psychiatric Medication

Nearly half of the patients in each group was receiving current psychotropic medications including antidepressants (AD), antipsychotics (AP), mood stabilizers (MS), benzodiazepines and one patient in DBT group was receiving stimulant medication (long-acting methylphenidate) and another one from the same group was on non-stimulant medication for adult ADHD (Atomoxetine). There was no significant difference between the two groups regarding psychotropic medications in general or in each drug class separately (Table 3).

3.4 Comparison between the Two Studied Groups According to DERS Outcome

DBT patients showed better improvement of emotion regulation than TAU as demonstrated in the statistically significantly lower mean of the total score of DERS that retained its statistically

significant lower values at the four month follow up following treatment year. The decrease in mean of DERS scores in the DBT group compared to TAU was also statistically significant for the mean value of all DERS subscales. Again, the outcomes obtained at the end of the treatment year were all maintained at 4 months follow up with he treatment year was maintained at 4 months, followed by statistically significant differences between DBT and TAU patients among all DERS subscales (Table 4).

4. DISCUSSION

According to American Psychiatric Association practice guidelines for treating psychiatric disorders, Dialectical behavior therapy (DBT) is considered an evidence-based and empirically supported treatment for borderline personality disorder (BPD) and suicidal and self-injurious behaviors. More than twenty randomized controlled trials (RCT) have investigated the efficacy of standard DBT in addition to 15 RCTs investigating DBT skills only. According to the Cochrane review on psychological therapies for people with borderline personality disorder published in [7], DBT is the most robust psychological therapy for treating BPD and effectively reduces suicide attempts, self-harm, and anger while improving general functioning.

Table 2. Comparison between the two studied groups according to psychiatric history

Psychiatric History	DBT (n = 18)		TAU (n = 18)		p
	No.	%	No.	%	
Co-morbid psychiatric illness					
Mood Disorders	5	27.7	4	22.2	$^{\chi^2}$p=0.856
Anxiety Disorders	1	5.55	3	16.66	^{FE}p=0.362
PTSD	2	11.1	4	22.2	^{FE}p=0.925
Adult ADHD	3	16.66	1	5.55	^{FE}p=0.487
Eating Disorder	1	5.0	1	5.55	^{FE}P=0.578
OCD	3	16.66	3	16.66	^{FE}P=1.000
Personality Disorder other than BPD	5	27.7	4	22.2	$^{\chi^2}$p=0.866
Substance abuse	2	11.1	3	16.66	^{FE}p=0.962
Total Co-morbid Psychiatric Illnesses					
Min. – Max.	0.0 – 3.0		0.0 – 3.0		^{MW}p= 0.821
Mean ± SD.	0.95 ± 0.85		1.05 ± 0.95		
Median	1.0		1.0		
Psychiatric Hospital Admission					
No	11	61.1	15	83.33	$^{\chi^2}$p=0.687
Yes	7	38.88	3	16.66	
No. of Hospital Admissions					
Min. – Max.	0.0 – 4.0		0.0 – 4.0		^{MW}p= 0.420
Mean ± SD.	0.65 ± 1.05		0.70 ± 0.37		
Median	0.0		0.0		

$^{\chi^2}$p: Value for Chi-square test, ^{FE}p: Value for Fisher Exact for Chi-square test, ^{MW}p: Value for Mann Whitney test

Table 3. Comparison between the two studied groups according to the current use of psychotropic medication

Current psychotropic medication	DBT (n = 18)		TAU (n = 18)		P
	No.	%	No.	%	
No	6	33.33	7	38.8	$^{\chi^2}$p=0.220
Yes	12	60.0	11	61.11	
AD	5	25.0	7	35.0	$^{\chi^2}$p=0.435
AP	3	15.0	1	5.0	^{FE}p=0.605
MS	1	5.0	3	15.0	^{FE}p=0.605
Benzodiazepines	1	5.0	0	0.0	^{FE}p=1.000
Stimulant Medication	1	5.0	0	0.0	^{FE}p=1.000
Non–stimulant ADHD Medication	1	5.0	0	0.0	^{FE}p=1.000

$^{\chi^2}$p: Value for Chi-square test; ^{FE}p: Value for Fisher Exact for Chi-square test

Table 4. Comparison between the two studied groups according to DERS outcome at the end of treatment and after four months of follow up

		DERS		
		Baseline	**End of treatment year**	**Follow up after 4 months**
Nonaccept	DBT	(n = 18)	(n = 18)	(n = 18)
	Mean ± SD.	20.16 ± 2.40	17.55 ± 2.14	17.55 ± 2.14
	TAU	(n = 18)	(n = 18)	(n = 18)
	Mean ± SD.	20.50 ± 2.20	20.27 ± 2.13	20.00 ± 1.78
	tp	0.667	<0.001*	<0.001*
Goals	DBT	(n = 18)	(n = 18)	(n = 18)
	Mean ± SD.	18.55 ± 1.78	15.66 ± 1.32	15.66 ± 1.32
	TAU	(n = 18)	(n = 18)	(n = 18)
	Mean ± SD.	18.77 ± 1.55	18.66 ± 1.53	18.66 ± 1.53
	tp	0.693	<0.001*	<0.001*
Impulse	DBT	(n = 18)	(n = 18)	(n = 18)
	Mean ± SD.	21.55 ± 2.22	12..88 ± 2.16	12.72 ± 2.16
	TAU	(n = 18)	(n = 18)	(n = 18)
	Mean ± SD.	21.61 ± 2.17	21.22 ± 2.15	20.83 ± 1.75
	tp	0.940	<0.001*	<0.001*
Aware	DBT	(n = 18)	(n = 18)	(n = 18)
	Mean ± SD.	21.72 ± 1.07	14.72 ± 1.70	14.44 ± 1.72
	TAU	(n = 18)	(n = 18)	(n = 18)
	Mean ± SD.	21.83 ± 0.98	21.44 ± 1.58	21.16 ± 1.72
	tp	0.748	<0.001*	<0.001*
Strategies	DBT	(n = 18)	(n = 18)	(n = 18)
	Mean ± SD.	29.00 ± 1.07	17.22 ± 2.63	16.66 ± 2.63
	TAU	(n = 18)	(n = 18)	(n = 18)
	Mean ± SD.	28.83 ± 0.98	26.33 ± 4.60	25.05 ± 4.70
	tp	0.855	<0.001*	<0.001*
Clarity	DBT	(n = 18)	(n = 18)	(n = 18)
	Mean ± SD.	20.77 ± 1.73	10.22 ± 2.41	10.11 ± 2.27
	TAU	(n = 20)	(n = 20)	(n = 20)
	Mean ± SD.	20.55 ± 1.68	20.22 ± 1.26	19.88 ± 1.36
	tp	0.699	<0.001*	0.007*
Total	DBT	(n = 18)	(n = 18)	(n = 18)
	Mean ± SD.	131.77 ± 6.80	88.27 ± 8.82	87.16 ± 9.35
	TAU	(n = 18)	(n = 18)	(n = 18)
	Mean ± SD.	132.11 ± 6.18	128.16 ± 7.03	125.61 ± 6.55
	tp	0.879	<0.001*	<0.001*

*tp: Value for Student t-test, *: Statistically significant at p ≤ 0.05*

DBT group had lower drop-out cases in comparison to the TAU group. This is consistent with the first RCTs compared standard 12 months of DBT to treatment as usual (TAU) and found a more significant reduction in the frequency and medical severity of self-injurious behaviors, the frequency, and length of inpatient hospitalization, and treatment drop out [12,13].

4.1 Emotional Dysregulation and Difficulties in Emotion Regulation Scale (DERS) Outcome

In the current study DBT patients showed better improvement of emotion regulation in comparison to TAU as shown in the statistically significant lower means of total score of DERS and also its subscales which maintained its statistically significant lower values at the 4 month follow up following treatment year [11,14].

These results are consistent with those shown by [15] when they examined the effect of DBT on emotion regulation as assessed by the Difficulties in Emotion Regulation Scale. Event-related functional magnetic resonant image (FMRI) was obtained pre- and post-12-months of standard-DBT in unmediated BPD patients. Healthy controls (HCs) were studied as a benchmark for normal amygdala activity and

change over time (n ¼ 11 per diagnostic-group). During each scan, participants viewed an intermixed series of unpleasant, neutral, and pleasant pictures presented twice (novel, repeat). Change in emotion regulation was measured with the Difficulty in Emotion Regulation (DERS) scale. FMRI results showed the predicted Group Time interaction: compared with HCs, BPD patients exhibited decreased amygdala activation with treatment. This post-treatment amygdala reduction in BPD was observed for all three picture types but particularly marked in the left hemisphere and during repeated-emotional pictures. Emotion regulation measured with the DERS significantly improved with DBT in BPD patients. Improved amygdala habituation to repeated-unpleasant pictures in patients was associated with enhanced over all emotional regulation measured by the DERS. However, there are some differences between this study and our study (comparing with the healthy group and using FMRI in the assessment of emotion regulation). Still, both studies showed improvement in emotion regulation as assessed by difficulty in Emotion Regulation scale (DERS), and this confirmed by findings found in FMRI.

Our results are also consistent with those shown by [16] when they examined the effect of DBT on emotion regulation as assessed by the Difficulties in Emotion Regulation Scale, depressed mood as assessed by the Beck Depression Inventory, and their associations with substance use frequency.

A sample of 27 women with substance dependence and BPD receiving 20 weeks of DBT in an academic community outpatient substance abuse treatment program at Connecticut, USA. His results showed improved emotion regulation, improved mood, and decreased substance use frequency. Further, emotion regulation improvement, but the not improved mood, explained the variance of reduced substance use frequency and increased behavioral control in BPD patients. These results confirmed our results regarding emotion regulation assessed by DERS but our study lakes of assessment of co morbid disorders like mood disorder and substance use disorder, and further studies in this concern are recommended.

An Egyptian study by Abdelkarim et al. [11], examined the effect of DBT for co-morbid borderline personality disorder and substance use disorder without drug replacement. Forty Egyptian outpatient were assigned for one year either to comprehensive DBT program (20 patients), or TAU (20 patients).

Patients were assessed at baseline, and follow-up assessment at 4, 8, 12, and 16 months was done using Arabic version of Difficulties in Emotion Regulation Scale (DERS), urine multidrug screen, and timeline follow-back method for assessment of alcohol and substance use history. This study's results following one year of treatment, DBT group showed significantly lower doses of drugs used, DERS score. However, this study was done on BPD patients with co morbid substance abuse disorder without drug replacement and was focusing mainly on SUD outcomes while our study not exclude drug replacement and was focusing on BPD outcome.

There are multiple points of similarity between both studies first, the same Egyptian sample size and their distribution between two groups (DBT vs. TAU) second, same period of treatment (one year) and follow up after 4 months of treatment. Both studies showed improvement of BPD symptoms and emotion regulation as was assessed by DERS at the end of treatment and after 4 months follow up.

A study by Gratz and Gunderson [17] provided preliminary data on the efficacy of a group intervention targeting emotion dysregulation among self-harming women with BPD, 14-week, emotion regulation group intervention, designed to teach self-harming women with BPD more adaptive ways of responding to their emotions to reduce the frequency of their self-harm behavior. Participants were matched on level of emotion dysregulation and lifetime frequency of self-harm and randomly assigned to receive this group in addition to their current outpatient therapy (N = 12), or to continue with their current outpatient therapy alone for 14 weeks (N = 10). The results of this study indicated that the group intervention had positive effects on self-harm, emotion dysregulation, experiential avoidance, BPD-specific symptoms, and signs of depression, anxiety, and stress. Participants in the group treatment condition evidenced significant changes overtime on all measures and reached normative levels of functioning on most.

Similarities between this study's outcomes and the current study could be explained by the similarity in the sample where both studies were utilizing a sample of women with BPD with

emotion dysregulation and self-harming behaviors. In our study emotion regulation skill as a part of DBT program, participants learned adaptive ways of responding to their emotions and how to deal with stresses in distress tolerance skill. Difficulties in Emotion Regulation Scale (DERS) was used to assess our participants pre-and post-treatment and showed statistically significant lower values at the 4 months follow-up following treatment year, which corresponds to improvement in borderline symptoms self-harm behaviors. BPD patients need to learn all four skills of DBT as skills from one set may be necessary to deal with problems in another area. For example, it seems reasonable that to effectively interact with people, one would be required to regulate emotions. Also, with increased ability to control emotions (e.g., Emotion Regulation) comes more consistency in day-to-day interactions, providing a more stable and consistent sense of self (e.g., Identity Disturbance), and this is a point of strength in our study.

These previous results would confirm the efficacy of DBT as a potential transdiagnostic treatment approach for persons suffering from defective emotion regulation in general as Attention Deficit/ Hyperactivity Disorder (ADHD), depression in elderly [18] and bulimia nervosa and binge eating [19]. More recently, it was also tried in a small-sized study for its efficacy in reducing pathological gambling. Although there were no statistically significant improvements in gambling behavior measures, 83% of participants were abstinent or reduced their gambling expenditure pre- to post-treatment, and participants also reported statistically and clinically significant improvements in psychological distress, mindfulness, and distress tolerance. Moreover, there were no increases in alcohol or substance use [20,21]. In addition, Clarkin et al. [22] showed that dialectical behavior therapy is effective in soothing anger, and Soler et al. [23] confirmed the effectiveness of the treatment to deal with impulsivity behaviors.

5. CONCLUSIONS

We provide the superior efficacy of DBT in improving emotion regulation in delta region's patients with BPD compared to TAU.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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