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Research paper

Application of a transdiagnostic treatment for emotional disorders to body dysmorphic disorder: A randomized controlled trial

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ABSTRACT

Background: Body dysmorphic disorder (BDD) is a common disorder which is associated with a high rate of comorbidity and functional impairment. Although research shows that cognitive-behavioral therapy can be an efficacious treatment for BDD, there is growing evidence that dysregulated emotion is a core deficit. The Unified Protocol for the Transdiagnostic Treatment of Emotional Disorders (UP) is a transdiagnostic, emotion focused cognitive-behavioral therapy protocol that has been developed to target emotion regulation processes that play an important role in the development and maintenance of many emotional disorders

Methods: : In the present study, 128 patients meeting criteria for BDD were randomized to either the UP (n = 64) or waitlist/treatment-as-usual (WL/TAU) condition. Diagnoses were determined using semi-structural interviews and patients also completed the Brown Assessment of Beliefs Scale (BABS), the Appearance Anxiety Inventory (AAI), the Difficulties in Emotion Regulation Scale (DERS), the Beck Depression Inventory (BDI) and the Clinical Global Impression (CGI).

Results: Repeated measure ANOVA indicated that the UP significantly decreased depression, BDD symptoms and body-related anxiety, as well as significantly improving emotional regulation all with large effect sizes compared to the TAU/WL condition. Treatment gains as well as remission of comorbid conditions were maintained at the three-month follow-up.

Limitations: : Our study limitations include restricted follow-up periods and excluding participants who were actively suicidal.

Conclusions: : To our knowledge, this is the first examination of the UP for BDD, and results suggest that this disorder shares common mechanisms with other disorders of emotion, and that the UP may be an additional efficacious treatment for this condition.

1. Introduction

Body Dysmorphic Disorder (BDD) is a severe, chronic and disabling disorder categorized by a distressing preoccupation with an imagined or slight flaw in physical appearance (American Psychiatric Association, 2013). These preoccupations with perceived defects and imperfections can be focused on any part of the body, but the most common areas involve head, body hair, and facial aspects including nose, hair, skin. Some studies show that there are gender differences in the specific areas of concern; for example, males are more preoccupied with their genitals and females are likely more concerned about skin, stomach, weight and breasts (Phillips and Diaz, 1997; Hartmann et al., 2013). Additionally, the majority of these perceived defects occur across multiple areas of their body (Phillips et al., 1993; Veale, 2004; Cororve & Gleaves, 2001; Rosen et al., Orosan,1995).Also, patients with BDD occasionally complain about overall general ugliness and are not able to pinpoint specific defects (Veale, 2004).

Studies show these preoccupations are time-consuming, with patients with BDD spending an average of 3 to 8 h per day on these appearance-related thoughts. (Philips, Gunderson, Mallya, McElroy, & Carter, 1998; Albertini & Phillips, 1999) These thoughts are intrusive and lead to excessive anxiety and compulsive behaviors such as camouflaging, mirror avoidance/ checking, skin-picking, and reassurance seeking. (Rabinowitz et al., 2007; Phillips et al., 2005) BDD is also

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associated with poor insight about the perceived abnormalities, and up to 39% of patients have delusions or ideas of reference, in that they believe other people notice their disfigurements. (Phillips, 2004; Phillips et al., 2006; Phillips & Hollander, 2008) Individuals with BDD often seek cosmetic surgery or dermatological treatments to enhance their appearance (Veale et al., 1996a,b; Phillips et al., 1993) with approximately 65% having received cosmetic treatment. (Crerand et al., 2005; Sarwer & Crerand, 2008; Chung-Sheng et al., 2010)

BDD is a very common disorder with the point prevalence in epidemiological studies in the adult population reported to be approximately 1.7% to 2.4% (Buhlmann et al., 2010; Koran et al., 2008; Rief et al., 2006), with a similar prevalence among adolescents. (Schneider et al., 2017; Grant et al., 2001). Onset of BDD is usually during early adolescence (Phillips, 2001) and a large study by Gunstand and Phillips (2003) indicated that the mean age of onset was 16 ± 6.9 and modal age was 13. BDD is often chronic and unremitting if left untreated and has harmful effects on normal development (Phillips, 1996).

BDD is associated with substantial comorbidity with other emotional disorders, or disorders with deficits in adaptive emotion regulation skills, (Barlow et al., 2011a) including mood, anxiety and related disorders (somatic symptom disorders, dissociative disorders, eating disorders and borderline personality disorder) (Phillips et al., 2007: Coles et al., 2006; Fang & Hofmann, 2010; Hartmann et al., 2013) and substance use disorders. (Çelik et al., 2011) Individuals with emotional disorders tend to use maladaptive emotional regulation strategies, which play an important role in the development, maintenance, and persistence of symptoms. (Barlow et al., 2017a;b)

From a theoretical perspective, BDD aligns well the model of emotional disorders. In 1998 and 2007, Brown and colleagues tried to identify latent variables corresponding to the *DSM–IV* (American Psychiatric Association,1994) constructs of anxiety, unipolar depression and related disorders, including social anxiety disorder, generalized anxiety disorder, obsessive-compulsive disorder, and panic disorder, using a structural equation model. They found that the higher order dimensions of negative affect and positive affect could explain much of the variance among these emotional disorders and all of the temporal covariance (bipolar disorder was not included). Based on high rates of comorbidity among these disorders, high levels of negative affect and low levels of positive affect, the term “emotional disorder” is now used to encompass these diagnoses. These disorders can be conceptualized as emotional disorders based on the extent to which: (1) the disorder is characterized by the experience of frequent and intense negative emotions; (2) there is an aversive reaction to the emotional experience itself that is driven by the individual's diminished sense of control and negative appraisal or valuation of the emotion; and (3) the individual engages in efforts to dampen, escape, or avoid the emotional experience, either preemptively or in reaction to the onset of a negative emotional state. (Barlow et al., 2014).

BDD is specifically associated with high levels of negative affect (Veale, 2004; Kollei et al., 2012; Summers et al., 2016). and studies show that patients experience a wide range of negative emotions including shame, self- disgust, hopelessness, anger, frustration, and guilt (Veale, 2004). Preoccupation with an imagined defect in appearance leads to high levels of self-focused attention, and patients with BDD experience shame and even self- disgust by comparing themselves with others. They use emotion avoidance coping strategies to minimize the degree of confronting their negative affect such as mirror checking/ avoiding wearing concealing clothes and using make up (Cororve et al, 2001). Thus, BDD would seem to be appropriately grouped among the emotional disorders.

At present, cognitive behavioral therapy (CBT) along with selective serotonin reuptake inhibitors (SSRIs) are the most effective treatments for BDD. (Allen, 2006; Phillips et al., 2008)

The most common intervention for BDD is exposure and response prevention (ERP) often accompanied by cognitive restructuring to challenge dysfunctional beliefs (Campisi, 1995; Neziroglu & Yaryura-Tobias, 1993 a, b), which are both common components of traditional CBT.

Several studies have demonstrated the effectiveness of CBT for BDD. (Wilhelm et al., 1999, 2011, 2014; Greenberg et al., 2016) Wilhelm et al. (2014) reported that after 22–sessions of CBT treatment their response rates were between 81% and 83%. Phillips et al. (2013), in naturalistic 4- year follow up, reported that the cumulative probability of being in full remission after a course of CBT was 0.2. Besides individual CBT psychotherapy, there is evidence that supports the efficacy of group-based (Rosen et al., 1995) and internet-based (Enander et al., 2016) CBT for BDD. Although evidence shows that CBT was a more effective intervention than anxiety management (Veale et al., 2014b) or supportive therapy (Enander et al., 2016), these interventions have been applied to treat BDD, too. Metacognitive psychotherapy (Rabiei et al., 2012), acceptance-based exposure therapy (Linde et al., 2015) and exposure and response prevention (ERP; Campisi, 1995) were other psychotherapy and behavioral interventions that have been used to treat BDD.

Including this study, many studies on CBT for BDD have limitations such as restrictive inclusion criteria and small sample size. (Koran et al., 2008; Wilhelm et al., 2011; Marques et al., 2011) In addition, CBT may have a limited effect on comorbid conditions associated with BDD. For example, Wilhelm et al. (2014) examined the efficacy of CBT for BDD with comorbid major depression. Although BDD symptoms decreased significantly, depression improved very little. (see Wilhelm et al., 2014, for review)

Given BDD's associated comorbidity, high levels of negative affect and additional characteristics of “emotional disorders”, and its responsiveness to CBT, a transdiagnostic cognitive-behavioral treatment might be a useful approach. The Unified Protocol (UP) is a transdiagnostic treatment of emotional disorders (Barlow et al., 2011a,b, 2017a, b,c; Bullis et al., 2014; Farchione et al., 2012) that was developed in response to considerable overlap between anxiety and depression symptoms, and the high rates of comorbidity among emotional disorders (Ellard et al., Barlow,2010;Sauer-Zavala et al., 2012). This intervention targets common underlying factors of emotional disorders especially neuroticism or negative affectivity (Barlow et al., 2017a,b; Farchione et al., 2012; Sauer- Zavala, et al., 2012), which are both present in BDD. And to note, the UP is a form of CBT, but the targets of treatment are transdiagnostic rather than single diagnostic.

The UP has had positive results in the treatment of anxiety disorders (Barlow et al., 2017; Ellard et al., 2010; Farchione et al., 2012), major depressive disorder (Boswell et al., 2014; Farchione et al., 2012; Ellard et al., 2010), bipolar disorder (Ellard et al., 2012), post-traumatic stress disorder (Gallagher, in press), and borderline personality disorder (BPD; Lopez et al., 2015; Sauer-Zavala et al., 2016)

1.2. The current study

The aim of the current study was to evaluate the efficacy of the UP for individuals with BDD. This randomized controlled trial compared treatment with the UP with a waitlist/treatment-as-usual (WL/TAU) condition to determine whether changes in symptoms were associated specifically with the UP. Hypotheses included greater efficacy for the UP (defined as ≥ 30% decrease in BDD symptoms) compared to the WL/TAU condition and retention of gains after a three-month therapy interval. Furthermore, comparative effects on primary diagnoses and comorbid conditions from baseline to posttreatment and follow-up periods are reported.

2. Methods

2.1. Participants

Participants consisted of 128 adults ranging from 19 to 43 years old (M = 28.85, SD = 6.07), with a principal diagnosis of BDD according to the DSM-5 (American Psychiatric Association, 2013). Participants were recruited by brochures that were given to clinicians in the area, including clinical psychologists, dermatologists, dentists and plastic surgeons. After a short phone screen, interested and eligible individuals were identified and invited for an in person assessment. Participants were eligible for the study based on the following inclusion criteria: (1) they were 18 years or older, (2) met principle DSM-5 BDD criteria for at least six months; (3) met at least a moderate severity score of 24 or more on the Yale-Brown Obsessive Compulsive Scale Modified for Body Dysmorphic Disorder. Exclusion criteria consisted primarily of conditions that required prioritization for immediate or simultaneous treatment including (1) current high risk of suicide (Barry et al., 2015) which was assessed by clinical interview (SCID-I) and item- number 9 of BDI-II, (2) substance abuse or dependency within the last 6 months, (3) psychotic disorders (i.e. schizophrenia, schizoaffective disorders); and (4) bipolar disorder (for more information review Brown et al., 1998). Additionally, patients were excluded if they (5) have previously received cognitive behavioral treatment for any disorder lasting more than 8 sessions, (6) had body concerns that were more consistent with an eating disorder diagnosis, and (7) were on psychotropic medication but did not meet stability criteria (in length of time and dosage of medication) for at least 12 weeks prior to initial evaluation. In order to participate in the study, participants on psychotropic medication must have agreed to not change their medication or even their dosage during the course of the study.

Two hundred seventy-two individuals were referred for an initial evaluation to determine eligibility. One hundred forty-four of them were excluded due to different principal diagnoses (n = 68), concurrent psychotherapy (n = 10), unstable medications (n = 18), past psychotherapy (n = 6) and current substance dependence (n = 42) (see participant flow chart in Fig. 1).

Our sample included 66 females (mean age = 27.13 years, SD = 5.85) and 62 males (mean age = 29.41 years, SD = 6.13), and their ages ranged from 19 to 43. The mean age of onset of BDD in this sample was 15.04. 14.1% of the participants were married, 72.7% were single and 13.3% were divorced. All of them had at least one comorbid condition, including the following: major depressive disorder, social anxiety disorder, general anxiety disorder, obsessive-compulsive disorder and excoriation disorder.

The primary appearance concerns of our sample included nose (n = 124, 97%), hair (n = 118, 92%), body size (n = 110, 86%), skin (n = 97, 76%), breast size (n = 54, 42%) and buttocks (n = 48, 37.5%). Sixty-one of patients were currently taking psychiatric medication which included citalopram (n = 27), fluoxetine (n = 18), sertraline (n = 11) and paroxetine (n = 5).

All participants (100%) had received at least two cosmetic treatments on their appearance and the most frequent procedure was rhinoplasty (n = 128), followed by Botox injection (n = 126), liposuction (n = 85), buttock augmentation surgery (n = 62), labiaplasty (n = 50), breast augmentation (n = 42) or reduction (n = 4), abdominoplasty (n = 12), and otoplasty (n = 3), and ninety participants had received more than three cosmetic treatments.

2.2. Procedure

After participants were deemed eligible for the study and signed consent forms for study participation and audio recording of sessions, they completed a baseline assessment and were randomly allocated

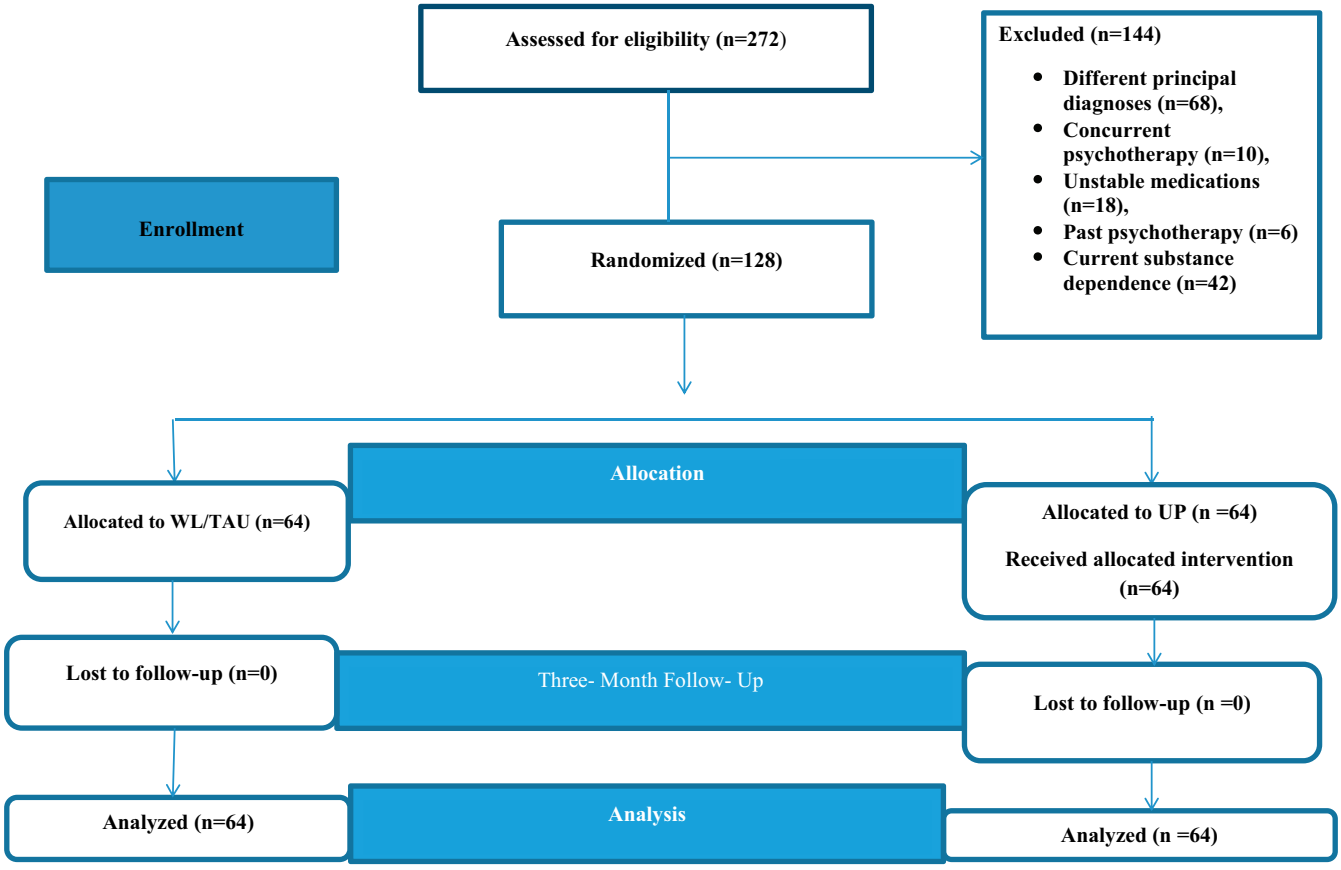

Fig. 1. Participant consort diagram.

using an urn randomization program (Stout et al., 1994) to one of two conditions: immediate UP or WL/TAU group. The WL/TAU participants also received UP treatment after the 3-month follow-up. Both groups were assessed at three phases: baseline, posttreatment and a three-month follow-up, which included all self–report measures and the SCID-I (First et al., 1996) which was administered by independent doctoral-level clinical students who were blind to conditions. In all cases, diagnoses were reviewed by experienced supervisors and consensus was reached on any initial disagreement.

Immediate UP and WL/TAU groups consisted of 64 (33 female) participants in each group. There were no drop outs in either group. The study was approved by the Ethical Board of Shahid Beheshti University of Medical Sciences.

The UP was delivered by a doctoral student of clinical psychology who was trained to administer the UP in a 16 h workshop. All therapy sessions for every participant were audio recorded, and then the recordings were rated for adherence to the UP protocol by three doctoral degree clinical psychologists who had experience with the UP. At weekly supervision sessions, the process of change for each participant was monitored and detailed feedback was provided for the therapist. All patients in the UP group received fourteen, 60 min, individual treatment sessions, which were free of charge and were conducted over a five-month period. UP was comprised of five main components. The following modules were administered.

1) Psychoeducation and treatment rationale (Session 1): participants were taught about the nature and function of emotion and were able to identify different aspects of their emotional experience, recognizing especially the important role of negative reinforcement in the maintenance of BDD.
2) Motivational enhancement (Session 2): is designed to increase participants' engagement during treatment, especially difficult exposure sessions.
3) Emotional awareness (Sessions 3–4): is designed to develop present-focused, nonjudgmental attitudes toward emotional experience in order to reduce avoidance and withdrawal behavior and to enhance tolerance during emotional exposures.
4) Cognitive reappraisal (Sessions 5–6): focuses on evidence that maladaptive beliefs and interpretation biases may contribute to the maintenance of BDD symptoms (Wilhelm & Neziroglu, 2002; Veale, 2004; Premo et al., 2016) and is designed to help participants develop more flexible thinking patterns.
5) Prevention of emotional avoidance (Sessions 7–8): is designed to highlight the important role of experimental avoidance in maintenance of BDD processes, and to modify these emotion regulation strategies.
6) Interoceptive exposure (Sessions 9–10): is designed to help individuals recognize internal somatic triggers for intense emotional experiences that provoke anxiety and distress, and to extinguish these reactions through repeated exposure to somatic cues.
7) Situational exposures (Sessions 10–14): are designed to teach patients how to identify external or situational emotional triggers, and to increase their tolerance of these emotions through exposure to the fearful anxiety provoking situation. Through exposure, patients learn to confront strong emotions, ultimately minimizing avoidance behavior. Length of time spent on this module can be extended based on patient's needs.
8) Relapse prevention (Session 15): is designed to review general treatment concepts, discuss patient's progress, and identify future stressors and difficulties that could risk the reoccurrence of symptoms, all with the goal of maintaining treatment gains and encouraging future progress.

The WL/TAU group received weekly 30 min telephone calls (no longer than 45 min) in part to reduce attrition, and their symptom severity (based on BDD-YBOCS), degree of insight (BABS) and their functioning (daily activities and their social life) were checked. Just empathic listening and clarification were delivered and the use of exposure and other cognitive techniques were prohibited. For the 30 patients (see Table 1) who were on medication, weekly visits with their psychiatrists for pharmacotherapy were allowed and continued. Thus this group received some supportive psychotherapy and about half of them continued with their medications, resembling a "treatment as usual" (TAU) condition; but all knew that they could receive the UP after 8 months if further treatment was necessary. Therefore, this condition is best described as a hybrid waitlist/treatment as usual (WL/TAU) condition.

If their symptoms or level of functioning worsened, their insight became poorer, or their psychiatrists decided to change medications or dosage, patients were dropped from the study and were referred to another clinical psychologist to receive appropriate treatment.

Table 1
Clinical and demographic characteristics of UP and WL/TAU group.

	UP(*N* = 64)	WL/TAU(*N* = 64)
Age Mean(SD)	28.71 (6.82)	27.76 (5.24)
Gender		
Female	33 (51.6%)	33 (51.6%)
Male	31 (48.4%)	31 (48.4%)
Marital status		
Single	43 (67.2%)	50 (78.1%)
Married	11 (17.2%)	7 (10.9%)
Divorced	10 (15.6%)	7 (10.9%)
Current medication use		
Clomipramine	12 (18.7%)	15(23.43%)
Fluoxetine	10 (15.62%)	8 (12.5%)
Sertraline	7 (10.93%)	4 (6.25%)
Paroxetine	2 (3.12%)	3 (4.68)
Current comorbidity		
Generalized anxiety disorder	9 (14.1%)	7(10.9%)
Major depressive disorder	12 (18.8%)	13 (20.3%)
Social anxiety disorder	25 (39.1%)	28 (43.8%)
Obsessive-compulsive disorder	14 (21.9%)	13(20.3%)
Excoriation disorder	4 (6.3%)	3 (4.7%)
Cosmetic treatment		
Rhinoplasty	64 (100%)	64 (100%)
Botox injection	64 (100%)	64 (100%)
Liposuction	50 (78.12%)	35 (54.68%)
Buttock augmentation	37 (57.81%)	25 (39.6%)
Labiaplasty	21 (32.81%)	29 (45.31%)
Breast augmentation	17 (26.56%)	25 (39.06%)
Breast reduction	2 (3.12%)	2 (3.12%)
Otoplasty	1 (1.56%)	2 (3.12%)
Abdominoplasty	7 (10.93%)	5 (7.81%)

2.3. Measures

The Structural Clinical Interview for DSM-IV Axis I disorders (SCID-I; Lobbestael et al., 2011) is a valid and reliable semi-structural interview and is widely used to diagnose psychiatric disorders based on DSM–IV-TR (American Psychiatric Association, 2000). The Persian version of SCID-I Kappa score was reported to exceed 0.85 (Sharifi et al., 2009) and in the current study it was used to diagnose BDD and other comorbid conditions. (Note: at the time of the study, a Persian version of the SCID for DSM-V was not yet validated. The clinical psychologists and supervisors on the study created a cross referenced checklist and determined that patients met criteria for BDD based on both the DSM-IV and DSM-V.)

The Yale Brown Obsessive Compulsive Scale modified for BDD (BDD-YBOCS; Phillips et al., 1997) is a validated, 12-item semi-structured interview that is widely administered to measure BDD symptom severity. Its scores range from 0 to 48; higher scores indicate greater severity. The Persian version possesses satisfactory psychometric properties (Rabiei et al., 2009) and internal consistency in the current study was high with Cronbach's alpha at 0.85.

Table 2
Baseline, posttreatment and follow-up scores.

	UP			WL/TAU		
	Pretreatment	Posttreatment	3-month follow-up	Pretreatment	Posttreatment	3-monthfollow-up
BDD-YBOCS	37.85 (3.27)	14.4(2.74)	14.1(2.16)	37.67 (3.36)	38.09(2.42)	38.26(3.27)
BABS Total	16.46(1.47)	2.31(0.95)	2.54(1.03)	16.65(1.44)	17.07(1.41)	17.17(1.2)
AAI	35.28 (1.66)	8.9(2.29)	9.37(2.24)	34.71(2.33)	33.12(3.58)	33.73(2.83)
BDI-II	39.81(4.51)	5.98(2.89)	6.21(3.02)	39.75(3.32)	38.14(3.67)	38.46(4.72)
DERS	135.85(4.15)	77.4(4.57)	78.89(4.68)	135.5(3.54)	136.678(3.59)	136.71(3.62)

Note: BDD-YBOCS = Yale-Brown Obsessive Compulsive Scale Modified for BDD; BABS = Brown Assessment of Beliefs Scale; AAI = The Appearance Anxiety Inventory; BDI-II = Beck Depression Inventory; DERS = The Difficulties in Emotion Regulation Scale

The Brown Assessment of the Beliefs Scale (BABS; Eisen et al., 1998) is a valid and reliable 7-item clinician-rated scale that measures current insight/delusionality about appearance related beliefs. Each item score ranged from 0 (least conviction) to 4 (most conviction). Total scores range from 0 to 24; higher scores indicate poorer insight. It has high internal consistency ($\alpha = 0.87$; Eisen et al., 1998). The Persian version also has satisfactory psychometric properties (Faqihi, Rajezi & Shams, 2016), and Cronbach's alpha in the current study was 0.82.

The Appearance Anxiety Inventory (AAI; Veale et al., 2014a) is a self-report 10-item questionnaire that focuses on cognitive processes and safety seeking behaviors of individuals suffering from BDD. Each item scores from 0 (not at all) to 4 (all the time) and total scores range from 0 to 40; scores of 19 or higher indicate the possibility of BDD presentation. In the present study, Cronbach's alpha was 0.86 and test-retest reliability at three months was. 92.

The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a 36-item self-report questionnaire assessing multiple aspects of emotional regulation difficulties in six domains, including (1) non-acceptance of emotional responses, (2) difficulties engaging in goal-directed behaviors, (3) impulse control difficulties, (4) lack of emotional awareness, (5) limited access to emotion regulation strategies, and (6) lack of emotional clarity. In the current study, we used the Persian version of the DERS (Mazaheri, 2015) and its internal consistency in the current study was excellent ($\alpha = 0.90$).

The Beck Depression Inventory (BDI; Beck et al., 1996) is a widely used self-report measurement that assesses depression symptoms and severity during the past two weeks. Its internal consistency, both in clinical ($\alpha = 0.92$) and non-psychiatric population ($\alpha = 0.93$), and its test-retest reliability ($r = 0.93$) are high (Beck et al., 1996). The internal consistency of the Persian version of the BAI is good ($\alpha = 0.92$) (Kaviani, & Mousavi, 2008), and internal consistency in current study was $\alpha = 0.87$.

The Clinical Global Impression- Severity and Improvement Scales (CGI-S and CGI-I; Guy, 1976) are widely used clinician administered measures assessing overall symptom severity and clinical improvement. Items on the CGI-S are rated from 1 (normal to no symptom severity) to 7 (the most severe symptoms), and items on the CGI-I were rated from 1 (very much improved) through 7 (very much worse). In current study we used the Persian version (Molavi et al., 2012)

2.4. Data analyses

Data were analyzed by SPSS 24. Using an “intent to treat” analysis, all data from all participants who had completed measures at baseline were analyzed. All 128 participants finished the trial (no attrition). Repeated measures ANOVA was used to investigate group differences and to identify within group differences. Paired sample *t*-tests were used to indicate whether participants maintained their treatment gains after a 3-month treatment interval. All tests were two tailed with an alpha level of 0.05 to determine statistical significance. To examine the efficacy of the UP, we computed effect size (Cohen's d) between: (a) baseline and posttreatment, (b) posttreatment and follow-up and (c) baseline and follow-up.

3. Results

3.1. Descriptive characteristics at baseline

No significant differences were found on Chi square tests and independent *t*-tests between the two groups in age ($t_{(126)} = -.88$, $p = 0.37$), sex ($\chi\ 2_{(2)}=0$, $p = 1$), comorbid conditions ($\chi\ 2_{(4)}=0.71$, $p = 0.95$) and marital status ($\chi\ 2_{(2)}=0.123$, $p = 0.37$). Demographic characteristics, comorbidity, medication use and previous cosmetic treatments in both the UP and WL/TAU groups are presented in Table 1.

At baseline assessment there were no significant differences between these groups in BDD symptom severity ($t_{(128)} = 0.319$, $p = 0.75$), anxiety about appearance ($t_{(128)} = 1.57$, $p = 0.11$), depression severity ($t_{(126)} = 0.08$, $p = 0.92$), BDD-related insight ($t_{(126)=-.72,\ p = 0.47}$), and difficulties regulating emotion ($t_{(126)} = 0.52$, $p = 0.59$).

3.2. Treatment outcomes

Means and standard deviations of dependent variables at baseline, posttreatment and a 3-month follow-up are presented in Table 2. Baseline assessment indicated that all the participants experienced moderate depression ($M = 39.78$, SD = 3.94), their BDD symptoms were severe ($M = 37.76$, SD = 3.3) and these symptoms were associated with high anxiety on the AAI ($M = 35$, SD = 2.03). The mean score on the DERS ($M = 135.67$, SD = 3.84) suggested major difficulties in regulating their emotions. Ninety percent of participants in the UP group and 83.6% in the WL/TAU group scored a 6 (severely ill) or 7 (among the most severe) on the severity dimension of the CGI (CGI-S).

Repeated measure ANOVA design with 3 (time: baseline, post and follow-up) × 2 (group: UP vs. WL/TAU) was used. The Muchly test for all of the measures except AAI, were significant, therefore Greenhouse-Geisser ($p = .82$) was used. The analysis revealed a main effect in the BDD-YBOCS ($F(1.56, 208.05) = 1098$, $p < 000$, effect size = 0.91), the BDI-II ($F(1.49, 188.23) = 1146.5$, $p < .000$, effect size = 0.91), the BABS ($F(1.89, 238.41) = 1715$, $p < .000$, effect size = 0.93), the AAI ($F(2, 256) = 6578$, $p < .00$, effect size = 0.91) and the DERS ($F(1.88, 237.71) = 37{,}029$, $p. < 000$, effect size = 0.96).

The results showed significant improvement of BDD symptoms over time ($F(1.68, 208.5) = 1001.51$, $p < 0.000$) (see Table 2). A 30% reduction in BDD-YBOCS scores is indicative of remission of symptoms (Phillips et al., 1997; Greenberg et al., 2016). In the current study, the treatment group showed a 61.95% reduction on the BDD-YBOCS with essentially no change in the WL/TAU group; moreover, no patients in the UP group met criteria for BDD based on the IE assessment at posttreatment. The group x time interaction of the BDI-II ($F(1.49, 188.23) = 1146.57$, $p < .000$) and the BABS ($F(1.89, 238.41) = 1715$, $p < .000$) showed significant reduction of depression symptoms, and improvement was observed in delusionality.

Results show that group x time interaction of AAI ($F(2, 252) = 1406$, $p < .000$) and emotion regulation ($F(1.9, 240) = 3061$, $p < .000$) were significantly improved as well.

To examine whether treatment efficacy was maintained at the 3-

Table 3
Paired *t*-test and effect size.

	Baseline to post-treatment			Post –treatment to follow-up			Baseline to follow-up		
	$t_{(63)}$	p	*Cohen's d*	$t_{(63)}$	P	*Cohen's d*	$t_{(63)}$	P	*Cohen's d*
BDD-YBOCS	47.33	.000	7.77	1.58	.117	.16	54.25	.00	8.6
AAI	84.48	.000	13.19	−1.75	.08	−0.2	72.45	.00	13.14
BABS	63.17	.000	11.43	−1.55	.12	−0.23	73	.00	10/96
BDI-II	49.92	.00	8.93	−1.02	.31	−0.07	49.36	.00	8.75
DERS	76.21	.00	13.39	−2.64	.01	−0.32	76.21	.00	13.39

Note: BDD-YBOCS = Yale-Brown Obsessive Compulsive Scale Modified for BDD; BABS = Brown Assessment of Beliefs Scale; AAI = The Appearance Anxiety Inventory; BDI-II = Beck Depression Inventory; DERS = The Difficulties in Emotion Regulation Scale

month treatment follow-up, a paired *t*-test was conducted for all measures and no significant change was observed from post-treatment to 3-month follow-up. Moreover, to identify treatment effectiveness, a paired *t*-test was conducted at first between baseline and posttreatment and then between baseline and follow-up. These results show that UP had a significant effect on symptom reduction and treatment gains were maintained. At follow-up assessment, 53% of the UP group scored 1 (very much improved) or 2 (much improved) on the CGI. (See Table 3)

Furthermore, we assessed emotional dysregulation as moderators of BDD symptom reduction, to determine whether improvements of emotional regulation would lead to treatment response. Therefore, we used hierarchical multiple regression to assess emotion dysregulation at baseline as moderators of treatment outcome which referred to decreases of BDD-YBOCS. The result show that emotional regulation ($R^2 = 0.002$, $p = .58$ and $F(1, 126) = 0.3$) was not mediator of symptoms reduction. Other assuming constructs tested include depression ($R^2 = 0$, $p = .95$ and $F(1, 126) = 0.003$) and insight ($R^2 = 0.005$, $p = .09$ and $F(1, 126) = 0.63$. It seems that the assumed constructs are not moderators of BDD symptom reduction.

Moreover, we performed a categorical analysis to determine how severity of BDD has been changed by significant symptom reduction (BDD-YBOC ≤ 15) during the current study. Crosstab analysis indicated that 23 (18%) of those with significant symptom reduction improved very much and 19 (14%) of them generally improved. Moreover, the result show that there is statistically significant association between symptoms reductions and treatment improvement ($\chi(6) = 73.27$, $p = .00$).

At the 3-month follow–up, another independent doctoral-level clinician, who was also blind to treatment condition, administered the SCID-I. No one in the treatment group met full criteria for any mental disorder based on the administered SCID-I.

4. Discussion

To our knowledge this is the first study to examine the use of the UP for BDD. Patients had severe BDD and depressive symptoms, had received at least one cosmetic treatment, and had poor insight and severe difficulties in emotion regulation. Their quality of life was poor and high rates of comorbidity were reported. Nevertheless, results from this study indicate that the UP may be an effective treatment for patients with this disorder. The mean score on the BDD- YBOCS decreased significantly and symptom severity improved from severe to subclinical range. Their BDD-related anxiety also improved substantially, along with any delusionality, and BABS scores suggested that their insight improved from poor to fair. Although depression levels at baseline were severe, ($M = 39.81$, $SD = 4.51$), participants' motivation to engage in the current study was not affected and no one dropped out of treatment, perhaps due in part (in the WL/TAU condition) to weekly 30 min phone calls. The UP's psychoeducation and motivational enhancement components may have also played an important role in dropout prevention, as well as the study participants' access to treatment at no cost.

The scores of the BDI-II decreased significantly with severity of depression improving from severe to mild. Posttreatment SCID-I scores indicated that all participants in the treatment group no longer met full criteria of BDD or any comorbid mental disorder and these participants maintained their gains for at least three months following treatment completion. Due to the UP's focus on underlying factors such as neuroticism, rather than directly targeting disorder-specific symptoms (e.g. panic attacks in panic disorder, excessive worry in generalized anxiety disorder) we were pleased with the reduction of symptoms across other emotional disorders as well as in BDD. Lack of significant change in the WL/TAU group from baseline to 3-month follow–up suggests that improvement of treatment group was not due to passage of time or to non-specific support, alone.

Of course, without more active free-standing comparison treatment we cannot fully estimate the influence of common factors, although BDD does not seem to be placebo responsive (Phillips, 1996; Veale & Bewley, 2015).

Pending replication, it seems the UP could be added to the list of existing interventions (Greenberg et al., 2010; McKay, 1999; Phillips et al., 2013; Veale et al., 2014b) as an additional first line approach to treat this difficult disorder.

Why is this potentially important? First, the UP addresses a single putative mechanism of action common to all disorders of emotion characterized by high levels of neuroticism. Responsiveness of BDD to the UP suggests, but of course does not prove, that BDD would also fall under the umbrella of the term "emotional disorders." (Bullis, Boettcher, Sauer-Zavala, Farchione, & Barlow, submitted) Assuming this is correct; the UP offers some advantages for dissemination and implementation in front line clinical settings.

By addressing the underlying core principles, the UP can be administered to the full range of emotional disorders (see Barlow and Farchione, 2017b), potentially relieving the burden on practitioners to learn multiple additional protocols for each different disorder and becoming proficient in one. Furthermore, the presence of comorbidity amongst emotional disorders, including BDD, the UP can treat all of the patient's ailments, not just one, saving time and possibly money in the long run for both the patient and the therapist. In other words, this transdiagnostic protocol can effectively treat BDD, but also any other comorbid emotional disorder present, like panic disorder or OCD.

4.1. Limitations

This study has several limitations. First, the WL/TAU condition, receiving as they did only 30 min. of weekly therapist contact, only partially contributed for the effects on non-specific factors. Second, there is a strong relationship between suicidality and BDD, but participants who were actively suicidal were excluded, limiting judgement on the effectiveness in patients with this characteristic. Third, all interventions were delivered by a single therapist. Fourth, severity of depression was assessed only by self-report. Fifth, we did not measure personality disorders which could moderate the outcome. And finally, sixth, the follow-up period was restricted to three months. Although participants did not meet criteria for BDD or other psychiatric disorders at 3 months post-treatment, a longer follow-up period would be important.

4.2. Conclusion

In summary, BDD is associated with a high rate of comorbidity, substantial functional impairment and little capacity to treat this disorder outside of scattered specialty clinics. The UP is a transdiagnostic emotion focused cognitive–behavioral therapy that is applicable to many emotional disorders characterized by emotional regulation difficulties. Although further investigation and research is needed, the current randomized clinical trial suggests that the UP would be an efficacious treatment for BDD.

Conflicts of interest

All author declare that there are no conflicts of interest

Contributors

Banafsheh Mohajerin: Conceptualization, Software, Formal Analysis, Visualization, Writing – Original Draft. *Maryam Bakhtiyar*: Conceptualization, Investigation, Project Administration. *Behrouz Dolatshahi:* Conceptualization, Methodology, Software, Formal Analysis, Validation, Data Curation. *Fereshteh Motabi:* Supervision. *Olenka S. Olesnycky*: Writing – Original Draft, Writing – Review & Editing.

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