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Dimensions of emotion dysregulation in bulimia nervosa

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Abstract

The goal of this study was to examine associations between dimensions of emotion dysregulation and eating disorder (ED) symptoms in bulimia nervosa (BN). This investigation used baseline data from a BN treatment study that included 80 adults (90% women) with full or subthreshold BN. Participants completed the Difficulties in Emotion Regulation Scale (DERS) and the Eating Disorders Examination (EDE) interview. The EDE global score was significantly correlated with the DERS total score, as well as several DERS subscales: Nonacceptance, Impulse, and Strategies. Further, the DERS Goals subscale was found to be uniquely associated with frequency of purging and driven exercise, although none of the subscales were associated with frequency of objective binge eating. Findings indicate that emotion dysregulation is associated with ED symptoms in BN, suggesting the utility of interventions that address emotion regulation skills deficits in the treatment of the disorder.

Keywords

emotion regulation; affect regulation; emotion; bulimia nervosa

Emotion regulation has been defined as a multidimensional construct emphasizing adaptive responding to emotional distress, versus efforts to control/suppress emotional arousal (Gratz & Roemer, 2004). This conceptualization has been applied to numerous forms of psychopathology, including substance use disorders (e.g., Fox, Hong, & Sinha, 2008),

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anxiety disorders (e.g., Roemer et al., 2009), and personality disorders (e.g., Bornolova et al., 2008). Gratz and Roemer's (2004) multidimensional model is characterized by four emotion regulation dimensions: (a) flexible use of adaptive strategies to modulate (versus eliminate) emotional intensity/duration, (b) maintaining behavioral control when distressed, (c) emotional awareness, clarity, and acceptance, and (d) willingness to experience emotional distress to pursue meaningful activities (Gratz, 2007; Gratz & Tull, 2010). Deficits in one or more of these dimensions are conceptualized as reflecting emotion dysregulation.

Both theoretical and empirical accounts suggest an important role for emotion dysregulation in eating disorders (EDs; e.g., Harrison, Sullivan, Tchanturia, & Treasure, 2010; Haynos & Fruzzetti, 2011). In particular, ED behaviors are often conceptualized as functioning as maladaptive strategies to regulate or escape aversive affective states. Several studies have found greater emotion dysregulation in ED versus control groups (Harrison et al., 2010; Harrison, Tchanturia, & Treasure, 2010; Svaldi, Gripenstroh, Tuschen-Caffier, & Ehring, 2012). Further, evidence suggests that those with anorexia nervosa (AN) and bulimia nervosa (BN) display certain emotion regulation difficulties (e.g., emotional nonacceptance, lack of emotional clarity) that are comparable to or exceed those characterizing major depressive disorder (Svaldi et al., 2012).

However, most ED studies utilizing the multidimensional emotion dysregulation framework have examined emotion dysregulation across various diagnostic or control groups. In addition to studies indicating greater levels of emotion dysregulation among those with EDs versus healthy controls, some evidence also suggests the presence of greater emotion regulation difficulties in BN versus BED and AN restricting type (e.g., Brockmeyer et al., in press; Brockmeyer et al., 2012; Harrison et al., 2010; Svaldi et al., 2012). However, the degree to which emotion dysregulation dimensions are associated with ED symptoms within specific diagnostic groups remains unclear. Such an approach can provide more information regarding the extent to which particular emotion regulation difficulties are related to various behavioral symptoms of EDs (e.g., binge eating, purging, compulsive exercise).

Recently, Racine and Wildes (2013) reported associations between dimensions of emotion dysregulation and ED symptoms in AN, finding that the specific emotion regulation difficulties of limited emotional awareness and poor impulse control when distressed were of particular salience in their sample. However, there are limited existing data regarding the extent to which emotion dysregulation dimensions are associated with ED symptoms in BN, although evidence suggests that this disorder is characterized by elevated emotion dysregulation (Harrison et al., 2010; Svaldi et al., 2012). Thus, this study sought to examine overall emotion dysregulation and specific emotion dysregulation dimensions in relation to overall ED psychopathology and symptom frequencies in BN. It was hypothesized that both overall and specific dimensions of emotion dysregulation would be associated with global ED psychopathology and frequencies of objective binge eating, purging, and driven exercise. Additionally, as a supplemental approach to examining the degree to which emotion dysregulation was related to ED psychopathology, an exploratory analysis was conducted to compare the levels of emotion dysregulation across individuals with full versus subthreshold BN.

Method

Participants and Procedure

Participants were 80 adults ($n=72$ females) from two sites in the Midwestern United States who were enrolled in a randomized control trial for the treatment of BN (see Wonderlich et al., 2014 for a description of the study and the primary treatment outcomes). The present investigation reports only on data collected during baseline assessments that preceded treatment. The sample had an average age and body mass index (BMI) of 27.3 ± 9.6 years and 23.9 ± 5.5 kg/m², respectively. Most participants were Caucasian (87.5%) and never married (68.8%).

Participants were classified as either full threshold (i.e., meeting DSM-IV [APA, 1994] criteria for BN) or subthreshold (i.e., experiencing compensatory behaviors accompanying subjective bulimic episodes at least weekly for 3 months before enrollment, or meeting BN criteria except for binge eating on average once per week). Of note, although some of the individuals in the subthreshold group may meet newly specified DSM-5 criteria for BN, at the time this treatment trial was conducted, only the proposed DSM-5 criteria for BN were available. Thus, we refer to the subthreshold group as it was originally defined in the study protocol, which allowed individuals with clinically significant subthreshold bulimic-type psychopathology into the study as specified in the description above. Exclusion criteria included pregnancy/lactation, BMI < 18 kg/m², lifetime bipolar or psychotic disorder diagnosis, current substance use disorder, medical or psychiatric instability, and current psychotherapy. Individuals on a stable antidepressant dose for 6 weeks were allowed to participate. The relevant institutional review boards approved this protocol.

Measures

BMI—Participants' height and weight were measured to calculate BMI.

ED Psychopathology—The Eating Disorder Examination (EDE) interview (Fairburn, Cooper, & O'Connor, 2008) was used to establish diagnostic status and to assess ED symptoms that were present during the previous 28 days. The EDE provides a global score and four subscale scores, as well as frequency counts for ED behaviors. Inter-rater reliability ratings (based on intraclass correlation coefficients) were conducted on a random sample of audiotaped interviews ($n=16$; 20%) and ranged from 0.909 to 0.999.

Emotion Dysregulation—The 36-item Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) was used to assess emotion dysregulation. The measure provides a total score and six subscale scores: nonacceptance (nonacceptance of emotional states), strategies (limited access to adaptive emotion regulation skills), goals (difficulty with goal-directed behavior in the context of emotional distress), impulse (difficulty controlling behaviors when upset), clarity (lack of emotional clarity), and awareness (lack of emotional awareness). Items are rated on 5-point Likert-type scale and are summed such that higher scores indicate greater emotion dysregulation. The measure has demonstrated good validity and reliability in past research (Gratz & Roemer, 2004), including in studies with ED

samples (e.g., Harrison et al., 2010; Racine & Wildes, 2013). Internal consistency in this sample was good for the total ($\alpha = .96$) and subscale (α s = .87–.94) scores.

Statistical Analyses

Pearson correlations were used to examine the bivariate association between four primary ED psychopathology measures (EDE Global score, frequency of objective binge eating, frequency of purging, and frequency of driven exercise) and the DERS total and subscale scores. Alpha was set at .01 for interpreting the significance of these bivariate correlations to correct for multiple comparisons. A second set of analyses was then conducted based on the correlational results. Specifically, multiple regression analyses were used to examine the unique associations between those DERS scales that were found to be significant in the correlational analyses for each respective ED symptom measure, controlling for two conceptually relevant covariates (i.e., BMI and full versus subthreshold BN status). Finally, an independent samples *t*-test comparing the DERS scales across the full versus subthreshold BN groups was conducted. There were two goals of this exploratory analysis. First, it served as an additional approach to examining the role of emotion dysregulation in relation to overall ED symptom severity, since by definition the subthreshold group is less severe in some form (i.e., in symptom frequency or type of symptoms, such as experiencing subjective versus objective binge eating). Additionally, this comparison could have relevance for understanding heterogeneity in emotion dysregulation among those diagnosed with BN using new DSM-5 criteria, since some subthreshold participants in this study would be classified as full BN using the new criteria.

Results

Descriptives and intercorrelations are presented in Table 1. A preliminary examination of the distributions of the variables was conducted. The ED behavior frequency variables and the BMI variable were found to be positively skewed, and were thus transformed prior to analysis. As anticipated, the DERS total was significantly associated with the EDE global score ($p < .01$), as were three of the DERS subscales (all $ps < .01$): Nonacceptance, Strategies, and Impulse. DERS Goals, Clarity, and Awareness were not significantly associated with the EDE global score (all $ps > .01$). Additionally, the DERS Goals subscale was negatively associated with purging frequency, while this subscale was positively associated with frequency of driven exercise. In contrast, there were no significant associations between DERS scales and objective binge eating frequency.

Next, a series of multiple regression analyses were conducted to examine the unique associations between the DERS total/subscales and ED variables, controlling for two conceptually relevant covariates (i.e., BMI and full versus subthreshold BN status). The first regression examined the unique association between the DERS total score and EDE global score, controlling for the covariates. The overall model was significant ($F_{(3,76)} = 3.40, p = .022$), predicting 8.4% of the variance in the EDE global score. As anticipated, the DERS total score ($\beta = .29, p = .014$) was uniquely associated with the EDE global score, although neither of the covariates were significant. The second regression was conducted with the two covariates and the three DERS subscales (Nonacceptance, Strategies, and Impulse) that were

found to be significantly associated with the EDE global score in the bivariate correlations. Although the overall model was significant ($F_{(5,74)}=2.51, p=.037$) and predicted 8.7% of the variance in ED psychopathology, none of the covariates or subscale scores ($\beta s=-.08-.16, ps>.05$) was uniquely associated with the global EDE score. This finding may be due in part to the high intercorrelations between these subscales (mean=.62, range=.54-.72).

The third regression examined the unique association between purging frequency and the DERS subscale that displayed a significant bivariate correlation with this ED behavior (Goals), controlling for the two covariates. The overall model was significant ($F_{(3, 76)}=5.22, p=.002$) and predicted 13.8% of the variance in frequency of purging episodes. BMI was a nonsignificant predictor, while both full versus subthreshold diagnostic status ($\beta=.22, p<.05$) and the Goals subscale ($\beta=-.37, p<.001$) emerged as uniquely associated with purging frequency. The final regression examined the unique association between driven exercise frequency and the DERS subscale that was significantly correlated with this ED behavior in the bivariate correlation analysis (Goals). The overall model was significant ($F_{(3, 76)}=2.86, p=.043$) and predicted 6.6% of the variance in frequency of driven exercise. The Goals subscale emerged as uniquely associated with driven exercise frequency ($\beta = .31, p=.007$), although neither of the covariates were significant.

Finally, an independent samples *t*-test was conducted to compare the DERS scales across the full versus subthreshold BN groups. As shown in Table 2, there was not a significant difference across the groups in terms of EDE Global score ($p=.079$). However, results revealed that when compared to the subthreshold BN group, the full threshold group displayed a mostly consistent pattern of greater emotion regulation difficulties.

Discussion

This study examined associations between emotion dysregulation dimensions and ED psychopathology in BN. Results were consistent with findings from previous empirical studies suggesting that those with EDs, including BN, display elevated levels of emotion dysregulation (Harrison, Sullivan, et al., 2010; Svaldi et al., 2012), as well as theoretical and treatment models positing that emotion regulation difficulties contribute to ED psychopathology (e.g., ED behaviors functioning as maladaptive strategies for managing affect; Haynos & Fruzzetti, 2011; Wildes, Ringham, & Marcus, 2010; Wonderlich et al., 2014). Specifically, the current findings suggest that several dimensions of emotion dysregulation are associated with overall ED psychopathology in BN. Further, overall emotion dysregulation was associated with ED psychopathology after controlling for BMI and full versus subthreshold diagnostic status, indicating the salience of difficulties with regulating negative emotional states in terms of symptom severity among individuals with BN. Finally, results also revealed that those with full versus subthreshold BN displayed higher levels of emotion dysregulation.

Several findings were particularly notable. First, the DERS subscale that displayed the largest association with overall ED psychopathology assessed difficulties maintaining behavioral control in the context of emotional distress (Impulse), which is consistent with the broad pattern of impulsivity that typically characterizes BN. However, unlike previous

studies with varying samples that found associations between ED psychopathology and lack of emotional awareness as assessed via the DERS (e.g., Svaldi et al., 2012), the ED measures were not significantly associated with this emotion dysregulation dimension in this study. This finding partially contrasts with results in AN found by Racine and Wildes (2013), in which both lack of emotional awareness and impulse control difficulties when distressed were uniquely associated with ED symptoms. These results may suggest a stronger role of difficulties with emotional awareness in AN versus BN, which is consistent with evidence of socio-emotional functioning deficits in AN (Oldershaw et al., 2011).

Second, the unique negative association between the DERS Goals subscale and purging frequency suggests that those with fewer perceived problems with the ability to maintain control of goal-focused behavior in the context of distress actually reported more frequent purging. One possible explanation for this finding is that purging may function as an emotion regulation strategy for these individuals (albeit a maladaptive one), such that purging may result in the perception of fewer emotion regulation difficulties in this particular domain. Alternatively, there may be third variables (e.g., personality traits) that contribute to this association. For instance, higher levels of perfectionism may contribute both to greater purging frequency (e.g., Forbush, Heatherton, & Keel, 2007) and to a potentially greater ability to maintain goal-focused behavior, even in circumstances characterized by emotional distress. Additional research will be needed to elaborate on this finding, particularly via assessments of potentially confounding third variables. Finally, it was notable that there were significant differences between the full and subthreshold BN groups in most emotion dysregulation dimensions, despite the lack of differences in overall ED psychopathology, which is consistent with prior research indicating that full and subthreshold ED presentations are often similar in severity (Fairburn et al., 2007). This suggests that there may be additional impairments in emotional functioning among those with full BN that may not directly associated with overall ED psychopathology.

Strengths of the current study included the use of interview-based ED symptom data, as well as the clinical nature of the sample, including participants who represented a range of ED symptom severity based on the inclusion of both full and subthreshold DSM-IV BN presentations. However, certain limitations also should be noted. First, the relatively small sample size may have limited the ability to detect smaller effects. Second, the limited diversity of the sample (e.g., ethnicity, gender) may reduce generalizability. Third, emotion dysregulation was measured via a self-report questionnaire, and future studies would benefit from the inclusion of behavioral tasks, psychophysiological measures, or other approaches to the assessment of emotion regulation difficulties. Fourth, other theoretically relevant constructs related to emotion dysregulation that may also play a role in BN were not assessed in this study (e.g., negative urgency, distress tolerance), and additional research investigating these emotion-related constructs in BN, including potential interactions, is recommended. Finally, the cross-sectional nature of these data precludes the ability to establish causal relationships; prospective studies will be needed to clarify the temporal nature of these associations.

Despite the limitations noted above, the results of the current study contribute to the existing literature on emotion dysregulation in BN, particularly with regard to associations between

emotion dysregulation dimensions and ED symptoms in this patient population. These findings are consistent with theoretical and empirical accounts of the role of emotion dysregulation (e.g., Harrison, Sullivan, et al., 2010; Haynos & Fruzzetti, 2011; Racine & Wildes, 2013) in eating disorders. Additionally, these results are consistent with certain approaches in ED interventions that address emotion dysregulation and related constructs, such as those included in Integrative Cognitive Affective Therapy (ICAT; Wonderlich et al., 2014) and Dialectical Behavior Therapy (Safer, Telch, & Chen, 2009), among others. Thus, targeting emotion dysregulation may prove useful in the treatment of individuals with BN.

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Means, Standard Deviations, and Intercorrelations between DERS Scales and Eating Disorder Symptom Measures (N=80)

	DERS Nonacceptance	DERS Strategies	DERS Impulse	DERS Goals	DERS Clarity	DERS Awareness	DERS Total	Mean	SD
EDE Global	.30*	.30*	.32*	.26	.16	.04	.31*	3.27	1.10
EDE OBE Frequency	.06	.10	.20	.04	.16	.11	.14	22.81	20.15
EDE Purging Frequency	-.28	-.16	-.10	-.32*	-.05	.14	-.18	30.53	29.74
EDE Exercise Frequency	.18	.05	.29	.31*	.14	.09	.23	7.43	9.48
Mean	16.26	20.21	14.79	16.20	13.20	17.36	98.03		
SD	7.12	7.19	5.52	4.95	4.57	5.49	26.32		

Note. DERS = Difficulties in Emotion Regulation Scale; EDE = Eating Disorder Examination Interview; OBE = Objective Binge Eating Episodes. Alpha was set at .01 for interpreting significance of the bivariate correlations. Data for variables that were transformed prior to analysis are presented here as the raw (untransformed) values.

* $p < .01$

Comparison of Global Eating Disorder Psychopathology and Emotion Dysregulation Dimensions in DSM-IV Full versus Subthreshold Bulimia Nervosa

Table 2

	Subthreshold BN (<i>n</i> = 22)		Full threshold BN (<i>n</i> = 58)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
EDE Global	2.92	1.09	3.40	1.08	-1.78	.079
DERS Nonacceptance	13.59	5.90	17.28	7.32	-2.11	.038
DERS Strategies	17.36	6.59	21.29	7.17	-2.24	.028
DERS Impulse	11.55	3.42	16.02	5.69	-4.29	<.001
DERS Goals	14.68	5.32	16.78	4.72	-1.71	.091
DERS Clarity	10.95	4.05	14.05	4.50	-2.82	.006
DERS Awareness	15.41	4.77	18.10	5.61	-2.00	.0495
DERS Total	83.55	21.29	103.52	26.11	-3.20	.002

Note. BN = Bulimia Nervosa; EDE = Eating Disorder Examination Interview; DERS = Difficulties in Emotion Regulation Scale. Bolded values indicate significance at $p < .05$.