

Published in final edited form as:

Int J Eat Disord. 2013 November ; 46(7): . doi:10.1002/eat.22145.

Emotion Dysregulation and Symptoms of Anorexia Nervosa: The Unique Roles of Lack of Emotional Awareness and Impulse Control Difficulties when Upset

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Abstract

Objective—Extant research suggests that individuals with anorexia nervosa (AN) have deficits in emotion regulation across a variety of domains. The current study investigated associations between specific difficulties with emotion regulation and the core symptoms of AN.

Method—Participants were 192 patients with AN presenting to an intensive eating disorder treatment facility. Emotion regulation was assessed using the multidimensional Difficulties in Emotion Regulation Scale, and associations with body mass index (BMI) at admission, eating disorder cognitions, objective binge eating, subjective binge eating, and purging were examined.

Results—Eating disorder cognitions were significantly associated with multiple forms of emotion dysregulation; however, only lack of emotional awareness was independently related to these symptoms. In contrast, impulse control difficulties when upset was the only emotion regulation impairment associated with the presence of recurrent objective binge eating and recurrent purging in AN. No significant relationships between emotion regulation and BMI or subjective binge eating were detected.

Discussion—Results point to differential associations between specific emotion regulation deficits and core symptoms of AN. These findings suggest that parsing the construct of emotion regulation as well as the AN phenotype can help to identify the unique ways in which eating disorder symptoms may function to regulate emotions.

Keywords

anorexia nervosa; eating disorder symptoms; emotion dysregulation; lack of emotional awareness; impulse control difficulties

Emotion regulation difficulties are present among individuals with anorexia nervosa (AN) and are thought to contribute to the development and maintenance of the disorder (1; 2). With regards to etiology, high levels of negative affectivity prospectively increase the risk of eating disorders (3). Moreover, some scholars have hypothesized that specific eating disorder symptoms are maintained by their emotion regulating functions. For example, dietary restriction may facilitate primary avoidance of negative emotions, whereas binge/

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Disclosures of Conflict

The authors have no financial or other conflicts of interest to disclose.

purge symptoms may help to reduce the experience of negative affect once it has occurred (4). Given increased appreciation of the relation between emotion regulation deficits and AN, it is not surprising that treatments targeting emotion regulation skills have begun to be developed and have shown initial promise (1; 5).

Numerous abilities contribute to the effective regulation of emotional experiences, and there are multiple conceptualizations and assessment tools for studying emotion regulation difficulties (6). In response to these problems, Gratz and Roemer (7) developed the Difficulties in Emotion Regulation Scale (DERS). The DERS is a multidimensional self-report measure that comprehensively assesses emotion regulation according to the following domains: 1) awareness and understanding of emotions; 2) acceptance of emotions; 3) the ability to engage in goal-directed behavior, and refrain from impulsive behavior, when experiencing negative emotions; and 4) access to emotion regulation strategies perceived as effective. Reviewing the literature on emotion regulation and AN using this multidimensional conceptualization can help to provide a nuanced understanding of the specific impairments associated with the disorder.

First, there is a wealth of evidence to suggest that individuals with AN have deficits in the ability to recognize and understand emotional experiences. For example, patients with AN report higher levels of alexithymia, defined as an inability to identify and describe emotions within the self, compared to controls (8). Further, AN has been linked to difficulties recognizing emotions within others, as assessed using tasks that require participants to identify emotional expressions from faces and from the eyes only (9; 10). These emotion processing difficulties are thought to be part of a larger set of deficits related to social, emotional, and cognitive functioning within AN (10). A few studies also suggest that individuals with AN pay less attention to, and are therefore less aware of, their emotions compared to controls (8; 11). Allocating minimal attention to emotional experiences could reflect a tendency towards emotional avoidance - a hypothesized core maintaining mechanism in AN (12; 13).

Second, with regards to acceptance of emotions, Corstorphine (14) argues that “secondary” emotions (e.g., feeling guilty over being sad) play a key role in the distress experienced by individuals with eating disorders, and these secondary emotions may develop in the context of an early invalidating environment. Indeed, qualitative and quantitative research has reported that many individuals with AN hold maladaptive core beliefs about the value of emotions (e.g., “emotional expression has aversive consequences”) (15; 16), and these core beliefs likely contribute to the perceived need to avoid or modulate negative emotions in AN. Further, in a handful of recent studies, AN was associated with poor distress tolerance (i.e., the ability to endure and accept negative emotions) and more secondary emotional responding (11; 17).

A third aspect of emotion regulation is the ability to inhibit inappropriate action, and act in accordance with desired goals, when experiencing negative emotions (7). In individuals with eating disorders, problems with behavioral control in the presence of strong emotions are thought to be related most strongly to binge eating and purging. For example, there is a robust association between the personality trait of negative urgency (i.e., the tendency to act impulsively in response to negative affect) and binge eating and purging (18). Negative urgency also may underlie the comorbidity of binge eating and purging with other dysregulated behaviors (e.g., alcohol/substance use, self-harm) (19). Finally, negative affect is a strong proximal trigger for the occurrence of binge eating and purging episodes in individuals with eating disorders (20), including AN (21). Although these symptoms typically cause guilt/shame for sufferers, difficulty inhibiting action and a desire to modulate

intense negative affect are likely to be important maintenance factors for binge eating and purging.

Finally, access to adaptive emotion regulation strategies and skills is the most commonly assessed conceptualization of emotion regulation and appears to increase risk for general psychopathology, including eating disorders (22). A recent meta-analysis that examined various adaptive and maladaptive emotion regulation strategies reported that less problem-solving and more avoidance, rumination, and suppression were associated with the presence of an eating disorder (22). In addition, individuals with AN endorse a general expectation that they will be unable to use strategies to effectively improve their mood when upset (8; 11). One possibility is that eating disorder behaviors develop as a means to regulate emotions in individuals who have pre-existing difficulties with access to effective emotion regulation strategies (23).

Consistent with evidence suggesting that AN is associated with broad impairments in emotion regulation, the handful of studies that have used the DERS with AN patients report greater emotion dysregulation compared to controls across all domains assessed (9; 11; 24). A question that has not yet been addressed in the literature, however, is whether specific aspects of emotion regulation may be distinctly related to particular AN symptoms. Investigating differential associations between features of emotion regulation and the core psychopathology of AN is critical in order to better understand the function of specific eating disorder symptoms. In turn, this work could help to advance treatments designed to reduce AN symptoms through enhancement of emotion regulation skills.

Therefore, the aim of the current study was to comprehensively explore the relationship between specific difficulties with emotion regulation as measured by the DERS and the following symptoms in a sample of patients with AN: body mass index (BMI), eating disorder cognitions, objective binge episodes (OBEs), subjective binge episodes (SBEs), and purging episodes. We had three hypotheses. First, given the extant literature on emotion processing in AN and the observation that some of these difficulties are related to the illness state (10), we hypothesized that poor emotional awareness and understanding would be most strongly associated with low BMI. Second, because functional models have proposed that disordered eating thoughts may serve to facilitate emotional avoidance (12), we predicted that difficulties with awareness and acceptance of emotions would be most highly correlated with eating disorder cognitions. Finally, in light of the well-established association between negative urgency and binge/purge symptoms (18), we hypothesized that impulse control difficulties when upset would be most strongly related to the presence of OBEs, SBEs, and purging in AN.

METHOD

Participants

Participants were 192 patients enrolled in a longitudinal study of AN (25; 26). Study inclusion criteria were: 1) age \geq 16 years; 2) BMI $<$ 18.5 or BMI percentile $<$ 10 (patients aged 16-19 years) at presentation for treatment; and 3) medical stability. In addition, participants with a comorbid psychotic disorder or mild mental retardation ($n = 4$) were excluded (25; 26). After the study was described, 194 patients (75.78% of those approached) signed consent forms approved by the Institutional Review Board (assent for participants under 18 years) and completed baseline assessments. Two participants who completed the baseline assessment were excluded from the current study due to missing data on the emotion regulation measure. Demographic and clinical characteristics of the final sample ($N=192$) are presented in Table 1.

Procedure

Data for the current study come from baseline questionnaires and interviews performed as part of a larger longitudinal study (25; 26). Interviewers were trained research clinicians, supervised by two licensed psychologists. Weekly consensus meetings were held to ensure consistency in interviewing, and 10% of interviews were coded by independent clinicians to establish inter-rater reliability.

Measures

Structured Clinical Interview for DSM-IV-TR Axis I Disorders (SCID-I; 27)—

Participants were interviewed using the SCID-I to establish AN diagnoses consistent with DSM-IV-TR criteria except: 1) amenorrhea was not required; and 2) 16 individuals with a BMI < 17.5, but who denied fear of fatness were included, consistent with a “non-fat-phobic” form of AN described in the literature (28). The SCID-I has established psychometric properties (29); inter-rater reliability for AN diagnosis in the current study was $\kappa = 1.0$.

Eating Disorder Examination, 16th edition (EDE; 30)—The EDE was administered to assess the severity of eating disorder cognitions over the past 28 days and the presence of recurrent (i.e., ≥ 1 episode per month) OBES, SBES, and purging episodes (i.e., self-induced vomiting, laxative misuse, diuretic misuse) during the past three months. The EDE comprises four subscales (Restraint, Eating Concern, Shape Concern and Weight Concern) and a Global score calculated as the mean of the four subscales. The four subscales of the EDE have been shown to correlate highly with the Global score in previous research (31) and in the current study (r 's = .80-.91). Therefore, we focused on the EDE Global score as a composite measure of eating disorder cognitions. However, we also report correlations between the EDE subscales and emotion regulation difficulties in Supplemental Table 1 (available online).

EDE subscale items are rated on a 7-point scale based on symptom frequency/severity, with higher scores indicating greater levels of pathology. The EDE subscales have shown acceptable internal consistency ($\alpha = .68-.90$) and inter-rater reliability ($\kappa = 0.70-0.99$) in previous research (32). Internal consistency ($\alpha = .94$) and inter-rater reliability (intraclass correlation coefficient [ICC] = 0.99) for the EDE Global score were excellent in the current study. Inter-rater reliabilities for the frequency of OBES, SBES, and purging episodes were ICC = 1.0, ICC = 0.99, and ICC = 0.99, respectively.

Difficulties in Emotion Regulation Scale (DERS; 7)—The DERS is a 36-item self-report questionnaire that comprehensively assesses the multi-dimensional construct of emotion regulation (7). The DERS provides a total score and six subscale scores in the following domains: 1) lack of clarity (Clarity) or the extent to which an individual knows and understands his/her emotional experiences; 2) lack of emotional awareness (Awareness), representing difficulty attending to and acknowledging emotions; 3) non-acceptance of emotional responses (Non-acceptance) or the tendency to have negative secondary emotional responses; 4) impulse control difficulties (Impulse), reflecting problems controlling one's behavior when experiencing negative emotions; 5) difficulties engaging in goal-directed behavior (Goals) as evidenced by poor concentration and an inability to accomplish tasks in the presence of negative emotions; and 6) limited access to emotion regulation strategies (Strategies) or the belief that little can be done to regulate emotions effectively once upset (7). DERS items are rated on a 5-point scale ranging from “almost never (0-10%)” to “almost always (91-100%).” Reliability and validity of the DERS have been established (7). In the current study, internal consistency was excellent for the total score ($\alpha = .93$) and adequate for each of the six subscales (α 's = .85, .77, .90, .88, .85, .89),

respectively. Gratz & Roemer (7) report inter-correlations among the DERS subscales ranging from .08 (for Goals and Awareness) to .63 (for Non-acceptance and Strategies). Supplemental Table 1 (available online) includes correlations among the DERS subscales from the current study.

Medical chart review—Participants' medical records were reviewed to obtain information about height and weight on the day of admission in order to calculate BMI (weight in kilograms/ height in meters squared). As part of the standard treatment protocol, participants were weighed on a digital scale in a hospital gown without shoes. Height was measured using a stationary stature board.

Covariates—Age, duration of illness, and level of care upon admission to treatment (i.e., inpatient or day hospital program) were considered for inclusion as covariates given relationships between these factors and AN symptom severity and presentation (33). In addition, symptoms of depression and anxiety were evaluated as potential covariates given associations with eating disorder severity and indices of poor emotion regulation (22; 34). Depression and anxiety were assessed using the Beck Depression Inventory-Second Edition (BDI-II; 35) and the Beck Anxiety Inventory (BAI; 36), respectively. The BDI-II assesses the severity of core symptoms of depression, as specified in the DSM-IV, as well as associated features of depression (e.g., crying, diminished sexual interest) over the past two weeks. The BDI-II has demonstrated excellent psychometric properties in previous research, including high internal consistency ($\alpha = .91$) and good factorial validity (37). The BAI assesses the severity of anxiety and panic symptoms over the past week by asking participants to rate items on a 4-point scale ranging from “not at all” to “severely”. Excellent internal consistency ($\alpha = .90$) has been reported, and convergent/discriminant validity for the BAI have been established through higher correlations with measures of anxiety versus depression (38). Internal consistency estimates for the BDI-II and BAI were excellent in the current study (BDI-II: $\alpha = .93$; BAI: $\alpha = .91$).

RESULTS

Univariate Models

Correlations and independent t-tests were used to examine univariate associations between the DERS scales and symptoms of AN (see Table 2). A Bonferroni correction was used to control for multiple testing, and statistics with a corresponding p value of $< .0014$ (i.e., $0.05/35$) were considered to be statistically significant. Correlations between BMI at admission and emotion dysregulation were universally low and, after correction for multiple testing, no significant relationships emerged. In contrast, eating disorder cognitions were strongly related to multiple emotion regulation difficulties. The only DERS subscale that was not significantly correlated with the EDE Global score was difficulty engaging in goal-directed behavior. As expected based on previous research (18), patients with AN who engaged in recurrent OBEs had higher levels of impulse control difficulties when upset than those who did not report OBEs. The same pattern was true for purging vs. no purging. Importantly, impulse control difficulties when upset was the only DERS subscale that was significantly associated with the presence of recurrent OBEs and recurrent purging. Finally, although patients with SBEs also appeared to have higher levels of impulse control difficulties when upset than those without these behaviors, this difference did not reach statistical significance after correction for multiple testing ($p = .009$).¹

¹We also examined whether impulse control difficulties when upset predicted the frequency of OBEs, SBEs, and purging episodes over the past 3 months using Spearman's rank correlations. Indeed, the DERS Impulse scale was significantly associated with OBE frequency ($r = .27$), SBE frequency ($r = .24$), and purging frequency ($r = .28$, all p 's $< .001$). Relationships between the frequency of these behaviors and the other DERS subscales were not significant after correction for multiple testing.

Multivariate Models

A series of hierarchical regressions were conducted to examine whether difficulties in emotion regulation predicted symptoms of AN over and above the effects of other significant covariates. Separate regressions for each dependent variable (i.e., EDE Global score, recurrent OBEs, recurrent purging) were conducted. BMI at admission and recurrent SBEs were not examined in multivariate models given non-significant univariate analyses (see Table 2). The first step of each hierarchical regression included covariates significantly associated with the particular AN symptom based on univariate analyses (data not shown). In the second step of the regression, all DERS subscales significantly correlated with the symptom (see Table 2) were added.

Table 3 presents results for the EDE Global score. Duration of illness, depression, and anxiety accounted for 31% of the variance in eating disorder cognitions. Five of the six DERS subscales were then included in the second step of the regression, and, together, these forms of emotion dysregulation accounted for an additional 4% of the variance in eating disorder cognitions. However, limited emotional awareness was the only DERS subscale to significantly predict eating disorder cognitions after controlling for covariates and other deficits in emotion regulation. It is important to note that the association between poor emotional awareness and eating disorder cognitions was independent of the robust effect of depressive symptoms on eating disorder psychopathology.

Table 4 presents hierarchical logistic regression results for recurrent OBEs and recurrent purging. Impulse control difficulties when upset significantly predicted the presence of recurrent OBEs over and above the effects of age and duration of illness. Examination of the Cox and Snell pseudo R^2 values indicated that impulse control difficulties uniquely accounted for 9% of the variance in OBEs. Similarly, the presence of recurrent purging was predicted by impulse control difficulties when upset after controlling for level of care at admission, depression, and anxiety. The effect of impulse control difficulties was less pronounced for purging than for binge eating, but these deficits uniquely explained 3% of the variance in recurrent purging beyond the effects of covariates.

DISCUSSION

To our knowledge, this study is the first to document that particular aspects of emotion dysregulation are differentially related to individual eating disorder symptoms in patients with AN. Using a multidimensional measure of emotion regulation, we found that difficulties with emotional awareness were uniquely related to eating disorder cognitions, whereas problems with impulse control when upset were linked to binge eating and purging. These findings extend previous research on emotion dysregulation in AN by demonstrating the utility of parsing the broader construct of emotion regulation in work examining the emotional functions of eating disorder symptoms. Moreover, the present data provide insight into specific emotion regulation impairments that may serve as potential treatment targets for AN.

Eating disorder cognitions were strongly associated with multiple forms of emotion dysregulation in the current sample, namely, difficulties with emotion understanding, poor emotion awareness, and lack of emotion acceptance. However, when emotion regulation difficulties were examined together, only lack of emotional awareness significantly predicted the severity of eating disorder cognitions, and this association was independent of depression and anxiety. Thus, among various aspects of emotion regulation, trouble paying attention to/acknowledging emotional experiences appears to be uniquely associated with eating disorder cognitions. These findings fit well with functional models of AN that describe how eating disorder symptoms (including cognitive correlates) help patients to

avoid emotional experiences as well as interpersonal relationships that can trigger emotional experiences (1; 12; 13). Indeed, a recent study found that emotion avoidance mediated associations between depressive and anxiety symptoms and eating disorder psychopathology in AN patients (12). Although emotional awareness and emotion avoidance are distinct (yet overlapping) constructs, our findings are consistent with the theory that individuals experiencing high levels of emotional distress may ignore or avoid their feelings through a heightened mental focus on weight, shape, and eating (1; 12).

In contrast to eating disorder cognitions, the only form of emotion dysregulation that was significantly associated with recurrent binge eating and purging in our sample of AN patients was impulse control difficulties when upset. Interestingly, the association between impulse control difficulties when upset and recurrent OBEs was stronger than that for recurrent SBEs, indicating that both the loss of control and overconsumption dimensions of OBEs are likely related to impulse control problems in AN. Numerous reports have documented the relation of impulsivity with binge eating and purging across the eating disorders spectrum, and recent research has found that negative urgency (i.e., the tendency towards emotion-based rash action) is the form of impulsivity that is most strongly linked to these behaviors (18). Given the large correlation between negative urgency and DERS impulse control difficulties ($r = .64$) (39), our findings add to this literature and suggest that both binge eating and purging are associated with impulsivity when upset in AN patients. These results are consistent with affect regulation models of eating disorders, which suggest that binge/purge behaviors function to help individuals distract from or alleviate negative emotions (2), particularly in people who feel out of control during these times.

Contrary to the study hypotheses, BMI at admission to intensive treatment was not significantly associated with emotion regulation difficulties in the current sample. Furthermore, although non-significant after correction for multiple testing, lower BMI at admission was related to better overall emotion regulation, which contradicted our hypothesis that lower BMI would predict poorer emotional clarity and/or awareness in AN patients. Another recent study detected a strong, positive correlation ($r = .72$) between emotion dysregulation and BMI in a small sample of acutely ill AN patients ($N = 23$) (40). The authors concluded that self-starvation may serve as a subjectively effective means of regulating negative emotions, such that AN patients may only endorse emotion regulation difficulties when they are at higher weights (40). However, given the restricted range of BMI in acutely ill AN patients and similar levels of emotion dysregulation in patients with AN and BN (who differ on body weight) (11; 24), future studies should continue to clarify associations between BMI and emotion regulation impairments in AN and other eating disorder populations.

Although this study provides novel information about associations between specific aspects of emotion regulation and particular eating disorder symptoms in a large sample of AN patients, several limitations must be noted. Most importantly, because the current data are cross-sectional, we cannot make causal inferences about associations between emotion dysregulation and eating pathology in AN. Emotion regulation impairments may increase risk for specific eating disorder symptoms in AN patients, or poor emotion regulation may be a consequence of low body weight or other features of the illness state. In support of a risk factor model, previous research has found that negative urgency is a longitudinal risk factor for, and shares a significant proportion of genetic influences with, binge eating (41; 42), suggesting that impulse control difficulties when upset may precede and predict the development of binge eating and purging in AN. Likewise, patient accounts suggest that personal and family of origin difficulties with emotional processing predate the onset of AN symptoms (16). With regards to state versus trait effects, two previous studies compared overall levels of emotion dysregulation (via the DERS Total Score) in currently ill and

recovered AN patients, with conflicting results (40; 43). Specifically, one study reported similar scores in ill and recovered AN patients (40), whereas the other documented evidence that emotion regulation normalizes upon recovery from AN (43). Future studies using recovered as well as prospective designs are needed to understand directional relationships between specific aspects of emotion regulation and component features of AN.

A second limitation of the current study relates to our reliance on a self-report measure of emotion regulation rather than experimental laboratory procedures or psychophysiological measures (e.g., skin conductance, heart rate), which may provide a more objective assessment of emotion regulation difficulties. Although it is possible that patients with AN lack insight regarding emotion regulation problems, this is inconsistent with data showing that DERS scores in AN patients are higher than in non-patient controls (11; 40) and comparable to other psychiatric patient populations (24). Third, lack of emotional awareness and impulse control difficulties when upset predicted a relatively small amount of the total variance in eating disorder cognitions and OBEs/purging, respectively. It is important for future research to consider additional unexamined variables (e.g., personality traits, neurocognitive impairments, genetic risk) that may interact with emotion regulation difficulties and possibly explain a larger amount of variance in AN symptoms than main effects alone. Finally, study participants were 16 years of age or older and were recruited from a tertiary care facility. Therefore, they may not be representative of the population of individuals with AN.

In sum, findings from the current study suggest that eating disorder symptoms are differentially associated with particular emotion regulation deficits in individuals with AN. These results provide further support for the development of novel treatments that conceptualize eating disorder behaviors as maladaptive attempts at emotion regulation and that teach skills to help develop more adaptive emotion regulation strategies (1). In the context of these and other treatments for AN, future work examining emotion regulation as a possible mediator or moderator of treatment outcome is critical for understanding the precise role of emotion regulation in eating disorder psychopathology. This work should focus on overall emotion regulation difficulties and those aspects that may be most relevant for core AN symptomatology (e.g., emotional awareness/avoidance) and specific AN subtypes (e.g., impulse control problems for AN-binge/purge subtype).

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Research supported by National Institute of Mental Health grant K01 MH080020 (Jennifer E. Wildes).

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Table 1

Demographic and clinical characteristics of the sample (N =192)

Characteristic	M (SD)	N (%)
Age	26.50 (10.18)	
Female		183 (95.3)
Caucasian		183 (95.3)
Anorexia nervosa subtype		
Restricting		85 (44.3)
Binge-eating/purging		107 (56.7)
Duration of illness (years)	8.52 (9.02)	
Level of care on admission		
Inpatient		160 (83.3)
Day hospital		32 (16.7)
BMI at admission	15.71 (1.82)	
Eating Disorder Examination Global score	3.03 (1.45)	
Recurrent OBEs (1/month) in past 3 months		47 (24.5)
Recurrent SBEs (1/month) in past 3 months		61 (31.8)
Recurrent Purging (1/month) in past 3 months		101 (52.6)
DERS Total Score	110.38 (24.47)	
DERS Clarity	14.85 (4.66)	
DERS Awareness	19.34 (4.85)	
DERS Non-acceptance	18.13 (6.57)	
DERS Impulse	15.38 (6.01)	
DERS Goals	18.09 (4.67)	
DERS Strategies	24.59 (7.41)	
Beck Depression Inventory-II	30.22 (13.25)	
Beck Anxiety Inventory	22.73 (11.57)	

BMI, body mass index; OBE, objective binge episode; SBE, subjective binge episode; DERS, Difficulties in Emotion Regulation Scale

Table 2

Correlations and independent t-tests examining relationships between DERS scales and symptoms of AN

DERS Scale	BMI	EDE Global score Correlations	Recurrent OBEs		Recurrent SBEs		Recurrent Purging		f^2 ^a
			OBEs M (S.D)	No OBEs M (S.D)	SBEs M (S.D)	No SBEs M (S.D)	Purging M (S.D)	No purging M (S.D)	
Total Score	.14	.45*	117.49 (22.31)	108.08 (24.77)	115.31 (21.11)	108.09 (25.64)	113.59 (24.11)	106.82 (24.51)	1.93
Clarity	.08	.37*	15.25 (4.09)	14.72 (4.84)	14.95 (4.37)	14.81 (4.81)	14.97 (4.21)	14.72 (5.14)	0.36
Awareness	.09	.37*	19.66 (4.10)	19.23 (5.09)	19.85 (3.98)	19.10 (5.21)	19.63 (4.67)	19.01 (5.06)	0.89
Non-acceptance	.10	.37*	18.25 (6.29)	18.09 (6.67)	18.32 (6.63)	18.03 (6.56)	18.52 (6.45)	17.69 (6.70)	0.88
Impulse	.10	.28*	18.53 (5.87)	14.36 (5.72)	17.05 (5.77)	14.61 (5.99)	16.88 (5.95)	13.72 (5.67)	3.75*
Goals	.17	.19	19.55 (4.11)	17.61 (4.76)	19.29 (4.12)	17.53 (4.82)	18.27 (4.44)	17.89 (4.93)	0.56
Strategies	.09	.33*	26.23 (6.65)	24.06 (7.59)	25.82 (6.59)	24.01 (7.72)	25.32 (7.39)	23.78 (7.40)	1.44

BMI, body mass index; EDE, Eating Disorder Examination; OBE, objective binge episode; SBEs, subjective binge episode; DERS, Difficulties in Emotion Regulation Scale

^adf = 190

* $p < .0014$

Table 3

Hierarchical linear regression analyses predicting eating disorder cognitions

	<i>t</i>	<i>R</i> ²
EDE Global score		
Step 1		.31 ***
Duration of illness	.02	0.34
BDI-II	.44	5.60 ***
BAI	.15	1.94
Step 2		.04 *
Duration of illness	.04	0.61
BDI-II	.35	3.82 ***
BAI	.14	1.72
DERS Clarity	.07	0.82
DERS Awareness	.18	2.54 *
DERS Non-acceptance	.06	0.75
DERS Impulse	-.04	-0.50
DERS Strategies	-.009	-.10

EDE, Eating Disorder Examination; BDI-II, Beck Depression Inventory-Second Edition; BAI, Beck Anxiety Inventory, DERS, Difficulties in Emotion Regulation Scale

p < .001

*
p < .05

Table 4

Hierarchical logistic regression analyses predicting the presence of objective binge episodes and purging episodes

	b (S.E)	Wald 2	OR (95% CI)	Cox and Snell R²
<u>Presence of recurrent OBEs</u>				
Step 1				.04
Age	-.05 (.03)	2.76	.95 (.90-1.01)	
Duration of illness	-.003 (.03)	0.008	.99 (.94-1.06)	
Step 2				.09
Age	-.04 (.03)	1.75	.96 (.90-1.02)	
Duration of illness	-.03 (.03)	0.67	.97 (.93-1.04)	
DERS Impulse	.13 (.03)	17.12 ***	1.14 (1.07-1.21)	
<u>Presence of recurrent purging episodes</u>				
Step 1				.08
Level of care at admission	1.05 (.42)	6.05 *	2.85 (1.24-6.55)	
BDI-II	.008 (.02)	0.30	1.01 (.98-1.04)	
BAI	.03 (.02)	3.27	1.03 (.99-1.07)	
Step 2				.03
Level of care at admission	1.17 (.44)	7.16 **	3.23 (1.37-7.61)	
BDI-II	-.005 (.02)	.10	.99 (.97-1.03)	
BAI	.02 (.02)	1.62	1.02 (.99-1.06)	
DERS Impulse	.09 (.03)	7.63 **	1.09 (1.03-1.16)	

OBE, objective binge episode; DERS, Difficulties in Emotion Regulation Scale; BDI-II, Beck Depression Inventory-Second Edition; BAI, Beck Anxiety Inventory

 $p < .001$

**
 $p < .01$

*
 $p < .05$