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Associations between emotion regulation and remission following cognitive behavioural therapy for adults with bulimia nervosa

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Abstract

Objective: Emotion regulation (ER) deficits are associated with illness severity in individuals with bulimia nervosa. We examined whether baseline ER abilities are associated with remission following enhanced cognitive behavioural therapy for eating disorders (CBT-E).

Method: Participants ($N = 50$, 85.0% female) receiving CBT-E completed a measure (yielding a global score and six subscale scores) of ER pre-treatment. Remission was assessed by the Eating Disorder Examination at post-treatment and follow-up. Analyses tested associations between baseline ER and behavioural, cognitive, or full remission at post-treatment and three-month follow-up.

Results: Lower global ER abilities, measured by the Difficulties in Emotion Regulation Scale, were associated with lower likelihood of behavioural and full, but not cognitive, remission at post-treatment. Specifically, individuals low in emotional clarity and impulse control were less likely to be behaviourally remitted. Those low in emotional acceptance, awareness, clarity, or strategies to manage emotion were less likely to be fully remitted. Global ER scores were not associated with any remission type at follow-up.

Discussion: Baseline ER deficits were associated with lower likelihood of behavioural or full remission at post-treatment. However, ER was less associated with remission at follow-up, indicating that ER is most important during treatment. Findings highlight a need for targeted treatments aimed at improving ER.

Keywords

bulimia nervosa; cognitive behavioural therapy; emotion regulation; remission

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1 | INTRODUCTION

Although cognitive-behavioural therapy (CBT) is the leading evidence-based treatment for bulimia nervosa (BN), only approximately 35% individuals who receive CBT achieve abstinence from binge eating and compensatory behaviours at the end of treatment (Agüera et al., 2013; Linardon & Wade, 2018). Of those individuals, far fewer meet full behavioural and psychological remission (i.e., binge eating and compensatory behaviour abstinence, plus Eating Disorder Examination [EDE] global scores within 1 standard deviation of community norms for eating pathology (Bardone-Cone et al., 2010). As such, understanding predictors of different types of remission may help researchers develop personalised interventions for individuals who may not respond optimally to enhanced CBT for eating disorders (CBT-E; i.e., a version of standard CBT adapted for transdiagnostic eating disorders).

One possible predictor of remission that warrants further exploration is deficits in emotion regulation (ER). Emotion regulation is a multidimensional construct that defines how individuals relate to, cope with, and understand their internal emotional experiences. Gratz and Roemer (2004) propose a six-factor model of ER, in which each of the factors (i.e., lack of awareness of emotion responses, lack of clarity of emotional responses, limited access to effect strategies to manage negative affect, challenges with controlling impulses while experiencing negative affect, difficulty engaging in goal-directed behaviours during negative affect, and nonacceptance of emotional responses) influences how an individual experiences and manages their negative internal experiences. Applied to BN, this model proposes that certain behaviours (i.e., binge eating and purging) help individuals to regulate negative emotions when they either (1) are unable to label and understand their emotional state or (2) lack more adaptive coping skills (Kenny et al., 2017; Stice et al., 1996).

Indeed, research suggests that greater deficits in ER are associated with more severe eating pathology and may contribute to low remission rates for cognitive behavioural therapy for BN (Lavender et al., 2014). In fact, findings from ecological momentary assessment studies have shown that negative affect increases prior to binge episodes and decreases after a binge has occurred, furthering evidence that binge eating may serve an emotion regulatory function (Berg et al., 2013; Haedt-Matt & Keel, 2011; Lavender et al., 2016; Schaefer et al., 2020). Individuals with BN who have greater difficulties managing emotion states may be less likely to achieve remission in CBT-E because (1) they are more likely to rely on ED behaviours to regulate negative emotions, which is only minimally addressed in CBT-E, and (2) changes to eating behaviours consistent with CBT-E recommendations (e.g., regular eating) are likely to increase emotional distress. One study found that improvement in access to ER strategies during the first six weeks of CBT-E for BN significantly predicted post-treatment remission (MacDonald et al., 2017), indicating that individuals who show improvements in ER over the course of treatment may be most successful. However, no research has examined whether baseline ER ability predicts remission from CBT-E for BN. If ER emerges as a baseline predictor of outcomes, personalised treatments that more specifically address ER deficits may improve outcomes.

As mentioned, only ~35% of individuals achieve behavioural remission from BN following CBT-E, and even fewer individuals achieve psychological and behavioural remission. There

is clinical utility in examining predictors of behavioural, psychological, and full (i.e., behavioural and psychological) remission, as individuals who achieve behavioural but not psychological remission from BN show higher body dissatisfaction and life-interference from their ED than those who achieve full remission (Bardone-Cone et al., 2010). It is possible that ER specifically may differentially impact behavioural and psychological remissions, especially as each of the six domains of ER may map onto a different aspect of recovery. For example, an individual who has challenges with accepting their emotions may be likely to minimise or negate their negative feelings, and may avoid changing their feelings due to avoidance; as such, their cognitions may stay the same. Alternatively, an individual who has challenges with controlling impulse during times of negative emotion may be less likely to achieve behavioural remission, as they may be more likely to engage in binge eating or compensatory behaviours impulsively without first thinking through and/or pursuing other options.

As such, the primary objective of the current study was to examine whether baseline ER difficulties predict remission for individuals with BN receiving CBT-E. In particular, the current study aimed to examine whether the domains of ER outlined by Gratz and Roemer (2004) predict different levels of remission (e.g., behavioural, psychological, and full) following a 16 session (delivered over 16 weeks) CBT-E for BN. We hypothesised that individuals with lower baseline ER ability would be less likely to achieve all remission types at both post-treatment and three-month follow-up.

2 | METHOD

2.1 | Participants

Participants ($N = 50$) were treatment-seeking adults participating in a treatment study forBN. Participants were eligible for the study if they were between the ages of 18 and 70, had a body mass index (BMI) of at least 17.5 (based on the Diagnostic and Statistical Manual of DSM-IV criteria for weight cutoffs), were medically stable enough to participate in outpatient treatment, and met criteria for DSM-5 BN or subthreshold BN (e.g., endorsed ED cognitions and at least 12 objectively- or subjectively-large binge eating episodes and at least 12 episodes of inappropriate compensatory behaviours (e.g., self-induced vomiting, laxative misuse, diuretic misuse, driven or compelled exercise, fasting) in the past three months; these criteria were chosen so as to include individuals with subthreshold BN). Notably, zero participants enroled in the study with a BMI below 18.5. Had that been the case, careful assessment would have been employed to make a differential diagnosis between BN and anorexia binge-purge subtype; however, this was not an issue in the current study.

Exclusion criteria included current or planned pregnancy within the next year, previous receipt of a full trial of CBT for BN, unstable psychiatric medication, current ED treatment, and previous history of bariatric surgery. The vast majority of the sample ($n = 45$, 90.0%) met full-threshold DSM-5 behavioural criteria for BN. The remaining 10% of the sample ($n = 5$) met criteria for other specified feeding and ED (other specified feed or eating disorder; a clinically significant ED that does not meet full diagnostic criteria for BN); these individuals endorsed 12+ binge eating episodes, but some or all of these episodes were only subjectively large; otherwise, they met all other criteria for DSM-5 BN. Further, 23 (46.0%)

of the sample had BN with self-induced vomiting, while the remaining 27 (54.0%) reported other compensatory behaviours (e.g., exercise, fasting).

2.2 | Procedure

The present study is a secondary data analysis of a study of CBT-E for bulimia-spectrum EDs (for more information on the parent study, see Juarascio et al., 2021). Treatment was 16 sessions of CBT-E based on the treatment approach developed by Fairburn (2008) with a supplemental mobile app component. The application delivered just-in-time adaptive interventions in response to self-reported momentary risk factors to promote in vivo skill use. All treatment was completed in-person. Participants were recruited from the community for participation through radio advertisements, flyers, and social media (e.g., Facebook, Instagram) advertisements. Participants were initially screened for eligibility via phone, provided informed consent, and completed an in-person or remote (due to the COVID-19 pandemic) baseline assessment to determine final eligibility. Assessment procedures included completion of a semi-structured diagnostic interview (Eating Disorder Examination; EDE; Fairburn et al., 2014) to determine ED diagnosis and eligibility, self-report measures, and behavioural tasks (e.g., mirror tracing tasks, a stop-signal reaction time test, and an n-back test). Assessments were conducted at baseline, mid-treatment (i.e., at session 8), post-treatment (i.e., within 1 week of session 16), and 3-month follow-up (3 months after session 16). All measures (EDE, self-report measures, and behavioural tasks) were completed at each assessment time. Notably, given that the aim of this project was to examine rates of remission following treatment, mid-treatment assessment data was not included as part of these analyses.

2.2.1 | Treatment—All participants received 16 sessions of in-person or videoconference (due to the COVID-19 pandemic) CBT-E (focussed version) and utilised an adjunctive smartphone application to complete self-monitoring records; the treatment manual utilised was based on Fairburn's CBT for ED (Fairburn, 2008), but did not include the optional, enhanced modules. All participants were asked to complete self-monitoring on their phones using an application developed for this study; the application also included push notifications to remind participants to complete their monitoring. Participants were assigned to one of two conditions: standard application or standard application with additional push reminders to use therapy skills. As the present analysis was not testing the effect of the application, we collapsed these groups and controlled for condition. Therapists were clinical psychology doctoral students and received supervision from licensed clinical psychologists. Remote assessments and therapy sessions were conducted via HIPAA-compliant Zoom. All study procedures were approved by the Institutional Review Board at a large, eastern university. All participants provided informed consent prior to commencing study procedures.

Behavioural remission criteria were defined as 0 episodes of objective or subjective binge eating or inappropriate compensatory behaviours in the past one month. While other studies have conceptualised recovery as requiring three months of abstinence from behaviours (Bardone-Cone et al., 2010), we selected one month due to the duration of our treatment; given that our treatment lasted 16 weeks, the requirement for three months (e.g., 12

weeks) of abstinence would have more accurately reflected an individual's early response to treatment than treatment's full effect. To maintain consistency, one-month duration was also used to define remission at follow-up. Psychological remission was defined as having an EDE Global Score within one standard deviation of community norms (Bardone-Cone et al., 2010). Full remission was achieved if individuals demonstrated both behavioural and psychological remission. Remission was coded categorically, such that 0 = not remitted and 1 = remitted for each of the three remission categories (psychological, behavioural, and full remission), such that participants had three individual remission scores: psychological remission (yes/no), behavioural remission (yes/no), full remission (yes/no).

2.3 | Measures

Eating Disorder Symptomatology and Remission: The EDE is a widely utilised, semi-structured interview for the assessment of ED symptomatology (Fairburn et al., 2014). The EDE yields frequency of binge eating and compensatory behaviours over the previous three months, as well as four subscale scores (Restraint, Eating Concern, Weight Concern, and Shape Concern) and a global score of cognitive ED symptoms.

Emotion Regulation: The Difficulties in Emotion Regulation Scale (DERS) is a 36 item, well-validated, self-report measure of ER and dysregulation (Gratz & Roemer, 2004). The DERS yields six subscale scores (Nonacceptance of emotional responses [Nonaccept], Difficulty engaging in goal-directed behaviour [Goals], Impulse control difficulties [Impulse], Lack of emotional awareness [Aware], Limited access to ER strategies [Strategies], Lack of emotional clarity [Clarity]) and a total score, with higher scores indicating greater difficulty with ER. The DERS does not have specified clinical cut-offs or severity markers. Given the negative impact of COVID-19 on mental health broadly (Raihan, 2020), it is possible that ER abilities decreased on a population level. As such, we tested differences between baseline DERS scores of those recruited before and during the pandemic and found them to not be statistically different (range of t scores = −3.51–1.67, range of p values 0.10−0.94.

Cronbach's alpha was computed for each DERS subscale. Results are as following: Nonaccept, α = 0.93, Goals, α = 0.89, Impulse, α = 0.90, Aware, α = 0.85, Strategies, α = 0.86, and Clarity, α = 0.90. For the DERS total, α = 0.84. Across total and subscales, results indicate high internal consistency.

2.4 | Statistical analyses

First, logistic regressions tested the main effects of DERS total score on each of the three remission categories at both post-treatment and follow-up. Notably, as mentioned, we completed analyses using a one-month time frame for remission, however, we also completed logistic regressions using a three-month time frame for remission at follow-up; the results did not change, and thus we retained the one month window for consistency between post-treatment and follow-up.

If a relationship was statistically significant, we completed follow-up analyses to test the main effects of all 6 baseline DERS subscale scores on each remission category. Treatment

condition and whether participants received remote vs. in person treatment were controlled for in all models. Further, given associations between ED severity and ER deficits, we controlled for baseline ED severity by including EDE global score in our model. Finally, we controlled for a false discovery rate (FDR) using the method outlined by Benjamini and Hochberg (1995). Further, we controlled for treatment condition. All analyses were conducted using International Business Machines Statistical Package for the Sciences IBM SPSS v 26.0.

3 | RESULTS

3.1 | Participants

Participants were 84.1% female ($N = 37$), on average 33.17 (SD = 8.95) years old, and were 67.9% White, 12.5% African-American, 8.9% Asian, 10.7% other [American Indian/Alaskan Native, prefer not to say, or general other]. The initial sample for this study included 56 participants; however, we completed analyses using a sample of 50 individuals who completed all of treatment. Further, six participants withdrew from the study between post-treatment and follow-up; as such, follow-up analyses only include data from 44 of the original participants. Due to COVID-19, not all participants were able to complete treatment or assessments in person; of the full sample ($N = 44$), 27 (61.5%) completed all study procedures in person, 11 (25.0%) received a combination of in person and remotely, and six (13.6%) completed all procedures remotely. Of the 44 participants, 22 (50.0%) were in the reminder on condition. Additional demographic information can be found in Table 1. Table 2 highlights remission rates at both post-treatment and follow-up.

3.2 | Difficulties in Emotion Regulation Scale subscales and remission: Regression results

Behavioural Remission.—Difficulties in Emotion Regulation Scale total score predicted behavioural remission at post-treatment ($\beta = -0.06$, $p = 0.006$, OR = 0.94), such that worse ER was associated with a lower likelihood of behavioural remission, but not at follow-up ($\beta = -0.01$, $p = 0.57$, OR = 0.99). As such, we examined the individual effects of DERS subscales on behavioural remission at post-treatment only. Results show that higher scores on all subscales except Nonaccept and Goals predicted behavioural remission from BN symptoms (i.e., binge eating and compensatory behaviours), such that for each one-unit increase in each of these subscales, behavioural remission was 13%–18% less likely.

Psychological Remission.—Difficulties in Emotion Regulation Scale total score was not associated with psychological remission at either post-treatment ($\beta = -0.03$, $p = 0.22$, OR = 0.98) or follow-up ($\beta = -0.01$, $p = 0.42$, OR = 0.99). As such, no analyses were conducted to examine specific DERS subscales as predictors of psychological remission.

Full Remission.—Difficulties in Emotion Regulation Scale total predicted full remission at post-treatment ($\beta = -0.17$, $p = 0.02$, OR = 0.85) but not at follow-up ($\beta = -0.07$, $p = 0.20$, OR = 0.94). As such, DERS subscales were then examined as predictors at post-treatment but not at follow-up. However, there were no statistically significant associations between DERS subscales and full remission at post-treatment. Table 3.

4 | DISCUSSION

This study was the first to examine whether baseline ER capabilities predicted remission in adults with BN receiving a 16-session course of CBT. As hypothesised, baseline deficits in ER were associated with lower likelihood of both behavioural and full remission at post-treatment. However, baseline ER was not associated with post-treatment psychological remission, nor was it associated any type of remission at follow-up.

Analyses at the post-treatment timepoint revealed specific relationships between various domains of baseline ER and likelihood of behavioural remission, but not psychological remission. More specifically, results showed that greater deficits in general and some subscales of ER (i.e., Clarity, Impulse, Awareness, Strategies) significantly predicted lower likelihood of behavioural remission. Odds ratios for the other two domains (Non-accept, Goals) were 0.85 to 0.96, respectively, similar to the odds ratios for the significant domains. However, despite medium to large effect sizes, these associations failed to reach statistical significance, which can occur in similar analyses both due to small sample size or chance. Further, while baseline total DERS score was associated with a decreased likelihood of full remission at post-treatment, no specific subscale scores reached statistical significance, suggesting that broad deficits may be important but that domain specific skills are not as essential. These findings should be considered in the context of previous research indicating that improvements in ER throughout treatment are associated with improvement in ED symptomatology (MacDonald et al., 2017); by providing evidence that baseline ER, not just ER changes during treatment, are associated with remission, our results lend support lend support to models positing that ER deficits may contribute to or maintain binge eating (Lavender et al., 2014).

Despite this initial evidence demonstrating that lower ER abilities are associated with lower likelihood of behavioural improvement following treatment, our analyses did not reveal a significant association between baseline ER and remission three months after completing treatment. These findings are consistent with past results demonstrating that ER improvements are associated with remission following dialectical behavioural therapy at post-treatment and four months post-treatment, but not at five or six months post treatment (Wallace et al., 2014). Our results fit within the context of extant literature demonstrating that ER skills and improvement appear to be beneficial for early outcomes, but have diminishing impacts over time. This could be due to changes in ER demands throughout treatment, either because (1) as individuals progress through treatment, they may habituate to difficult emotions and/or negative affect may decrease, thus minimising the need for ER skills or (2) treatment itself may engender difficult emotions and once in the follow-up stage, those emotions may dissipate. Furthermore, given notable effect sizes, it appears there may be some association between these constructs that was not capture in our data; future research may consider replicating these findings in a larger sample size.

In general, however, our findings indicate that baseline ER abilities are associated with changes in ED behaviours, such that better ER was associated with favourable behavioural outcomes, but seem to have little bearing on improvements in ED cognitions. The association between ER and behaviour change may exist because individuals with BN rely

on behaviours such as binge eating and inappropriate compensatory behaviours to manage negative emotions (either general or body image/weight/food specific) in the absence of adaptive skills (Lavender et al., 2016), and it follows that those with fewer skills are more likely to continue to engage in ED behaviours, especially as focussed CBT-E does not emphasize ER skills. However, the associations between ER and cognitive recovery remains less clear, and future research should examine this association in more detail.

At follow-up, there were no statistically significant associations between baseline ER and any type of remission. Generally, the weakening of the relationships at follow-up may indicate that one's ability to manage their emotional reactions is very important for early progress in treatment but does not as strongly impact the ability to maintain treatment gains, consistent with findings by Wallace et al. (2014). One explanation is that CBT asks patients to implement behaviour changes that are likely to lead to momentary increases in negative affect, especially in the first weeks of treatment when individuals are asked to reduce dietary restraint and compensatory behaviours and start weekly weighing. For example, for individuals who are accustomed to irregular patterns of eating (e.g., restricting for the majority of the day followed by binge episodes) and compensatory behaviours, engaging in regular eating and reducing compensatory behaviours is likely to bring up feelings of discomfort, anxiety, guilt, and/or shame, which may increase urges to engage in ED behaviours. As such, having access to ER skills may be essential to making progress during treatment. However, as individuals engage in healthy behaviours on a regular basis, it is likely that those behaviours will become less challenging, as is the model of most exposure-based therapies showing that distress decreases with repeated exposure to feared situations, thoughts, and feelings (Abramowitz et al., 2019). With improvements in ED pathology in treatment, it is also possible negative affect also decreases, meaning there is less need for ER skills after treatment ends. As such, at this time, the importance of some ER skills may decrease and/or other factors may become more important in predicting remission. However, our post-treatment analyses did yield small effect sizes, indicating that in a larger sample, there may be relationships between baseline ER and outcome that we were underpowered to detect.

One main implication of these findings is the clinical utility. As mentioned, it is possible that individuals with deficits in ER do not respond as well to CBT as those with strong ER skills due to the therapeutic model of CBT-E. The early goals of CBT-E are behaviour modification and skill building (i.e., initiation of regular eating, cessation of compensatory behaviours) and there is less of a specific focus on development of advanced ER skills. Although emotions are addressed in CBT in so far as they inform thoughts and behaviours, ER is not central to treatment and emotion focussed skills are not (a) covered in detail, (b) tracked consistently as part of treatment goals. In sum, while CBT-E may indirectly address ER as a pathway to improve skill acquisition, emotion focussed techniques aimed at specifically improving general emotion regulatory abilities are not central to the CBT model. As such, CBT may not be as beneficial for those who have deficits in ER. However, knowing which domains of ER predict outcome for individuals with BN may allow for more targeted treatment approaches. Specifically, the domains that predicted behavioural remission at post-treatment (Impulse, Awareness, Strategies, and Clarity) are all areas that are targeted by many mindfulness and acceptance-based treatments, broadly defined as

treatment models that target change through processes such as acceptance, mindfulness, cognitive diffusion, and ER (Barney et al., 2019). If individuals received a measure of ER capabilities prior to treatment, such as the DERS (Gratz & Roemer, 2004), and are found to have deficits, they could be placed in a treatment that would more specifically target ER skills. For example, an individual with low acceptance of emotional experiences who does not have access to healthy coping skills may respond to negative affect with minimisation and turning to binge eating instead of more adaptive skills. Thus, a treatment that provides additional guidance in helping that patient to recognise, accept, and cope with their emotions may help to improve outcomes, especially as improvements in ER during treatment are associated with better outcome.

4.1 | Strengths

One strength of this study was the sample itself; all participants had a DSM-5 diagnosis of BN or (other specified feeding or eating disorder, bulimia nervosa) OSFED-BN and were receiving CBT in an outpatient setting, thus making it more generalisable for clinical populations. Second, we considered not only remission at post-treatment but as follow-up, and considered multiple types of remission. These findings help to clarify when and how ER may be impactful, and highlight that there may be other factors influencing short term remission that are important to consider. Finally, the use of a clinician-rated interview (i.e., EDE) as a measure of eating pathology helped to eliminate any challenges of self-report and provided a more objective picture of ED symptoms.

4.2 | Limitations

As is common with studies conducted fully or partially in 2020, one major limitation of this study was the transition to telehealth treatment as a result of COVID-19 starting in March 2020. As this study was mid-recruitment when the shelter in place orders were first implemented, there are three groups a participant may fall into: (1) completed all treatment and assessment in person, (2) completed some treatment and assessment in person and some remotely, (3) all treatment and assessments completed remotely via Health Insurance Portability and Accountability Act HIPAA complaint video platforms. Although we controlled for type of treatment received, it is possible that ER's impact on remission could depend on whether an individual received telehealth or in-person treatment.

Second, there is a chance that individuals' ER abilities suffered as a result of the pandemic and the social, emotional, and environmental disruptions that occurred during the time this study was completed. While we did not observe any differences in baseline ER between those who started treatment pre-pandemic and those who started treatment once the pandemic began, research has shown significant deleterious impacts of the pandemic on mental health, including an increase in depression and anxiety, general burnout, and eating pathology (Raihan, 2020); it is possible that worse overall mental health could have also impacted outcomes despite there not being significant differences.

Third, as mentioned before, the parent study was examining the broad, not focussed, version of CBT-E. As the focus version contains a specific module on mood intolerance, future research may consider examining whether baseline deficits in ER are associated with

outcome for those who receive specific treatment content regarding mood management. Further, while we controlled for treatment condition, it is possible that those who received more push reminders had greater improvement in ER that should be more carefully examined in future studies. Finally, this study had a relatively small sample size, which may have decreased our power to detect associations between ER and outcome, particularly at follow-up. As such, these results should be replicated in a larger sample. While we did control for the number of analyses run using an FDR correction, there is still an increased risk of a Type I error.

5 | CONCLUSIONS

Overall, findings from this study show that deficits in ER in individuals with BN are associated with a reduced likelihood of being remitted following a 16-week CBT-E treatment. Future treatments may consider specifically targeting three domains of ER, nonacceptance of emotional responses, impulse control difficulties, and limited access to ER strategies, as these were the most predictive of outcome. Targeting treatment could be done through testing whether personalised interventions (such as one aimed at targeting ER and developing coping mechanisms for those with low ER abilities) yield higher remission rates for these individuals than standard CBT-E.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Abbreviations:

BMI	body mass index
BN	bulimia nervosa
CBT	cognitive behavioural therapy
CBT-BN	cognitive behavioural therapy for BN
CBT-E	enhanced cognitive behavioural therapy
DERS	difficulties in emotion regulation scale
ED	eating disorder
EDE	eating disorder examination
ER	emotion regulation
FDR	false discovery rate

LOC	loss of control
MABTs	mindfulness and acceptance-based treatments
OBE	objective binge episodes
OSFED	other specified feed or eating disorder
SBE	subjective binge episodes

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Highlights

- Baseline Emotion regulation (ER) predicted behavioural, but not cognitive, remission following cognitive behavioural therapy for eating disorders (CBT-E), such that those with baseline deficits were less likely to be remitted. Further, baseline ER predicted full remission, in the same direction.
- Baseline ER was not associated with any type of remission three months post-treatment.
- Specific domains of ER may differentially impact remission categories.

TABLE 1

Baseline demographic characteristics, N=50

	M	*SD*	Range	Possible range
Age	37.90	*14.15*	19–68	
OBEs[a]	38.67	22.87	20–84	
SBEs[a]	12.33	23.27	0–58	
LOC[a,b]	51.00	30.11	30–95	
Purging	44.00	83.86	0–214	
Compensatory Bx[c]	28.33	26.49	4–64	
BMI	28.57	*5.14*	20.9–33.9	
DERS nonaccept	18.57	*8.57*	9–30	6–30
DERS goals	20.00	*5.76*	12–25	5–25
DERS impulse	19.17	*4.88*	14–27	6–30
DERS aware	20.17	*4.58*	13–24	6–30
DERS strategies	27.00	*8.05*	18–40	8–40
DERS clarity	13.67	*5.75*	6–20	5–25
DERS total	118.67	*29.49*	77–150	36–180

Abbreviations: BMI, body mass index; DERS, difficulty in emotion regulation scale; LOC, loss of control; OBE, Objective binge episodes; SBE, subjective binge episode.

[a] All binge totals are for past three months combined.

[b] LOC refers to total number of loss of control episodes, or the sum of objective and subjective binge episodes.

[c] Includes laxative use, diuretic use, compensatory exercise, compensatory fasting, and other extreme weight control behaviours (e.g., diet pills, chewing and spitting).

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TABLE 2

Remission rates at post-treatment and follow-up

	Post-treatment (*N* = 44)	**Follow-up (*N* = 44)**
Cognitive remission	35 (68.6%)	26 (59.1%)
Behavioural remission	40 (90.9%)	34 (68.0%)
Full remission	18 (40.9%)	19 (38.0%)

TABLE 3

Predictive relationships between each Difficulties in Emotion Regulation Scale (DERS) subscale and types of remission at post-treatment

	Behavioural remission			Full remission		
DERS subscale	***β***	***p***	**OR**	***β***	***p***	**OR**
Nonacceptance	−0.17	0.02	0.85	−0.07	0.38	0.94
Goals	−0.04	0.59	0.96	−0.07	0.26	0.92
Impulse	−0.15	0.03[a]	0.87	−0.05	0.58	0.95
Aware	−0.17	0.02[a]	0.85	−0.01	0.57	0.99
Strategies	−0.14	0.02[a]	0.87	−0.01	0.42	0.99
Clarity	−0.21	0.02[a]	0.82	−0.07	0.20	0.94

[a]denote statistical significance following FDR correction.