



# Examining the associations between emotion regulation difficulties, anxiety, and eating disorder severity among inpatients with anorexia nervosa

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## Abstract

**Objective:** There is growing interest in the role of emotion regulation in anorexia nervosa (AN). Although anxiety is also hypothesized to impact symptoms of AN, little is known about how emotion regulation, anxiety, and eating disorder symptoms interact in AN. In this study, we examined the associations between emotion regulation, anxiety, and eating disorder symptom severity in AN.

**Methods:** Questionnaires and interviews assessing emotion regulation difficulties, anxiety, eating disorder symptoms, and eating disorder-related clinical impairment were collected from group of underweight individuals with AN ( $n = 59$ ) at admission to inpatient treatment. Hierarchical linear regressions were used to examine the associations of emotion regulation difficulties, anxiety, and the interaction of these constructs with eating disorder symptoms and eating disorder-related clinical impairment.

**Results:** Emotion regulation difficulties were significantly positively associated with eating disorder symptoms and related clinical impairment only when anxiety levels were low and anxiety was significantly positively associated with eating disorder symptoms and related clinical impairment only when emotion regulation problems were not elevated.

**Conclusions:** This study adds to a growing literature suggesting that emotion regulation deficits are associated with eating disorder symptoms in AN. Certain individuals with AN may especially benefit from a focus on developing emotion regulation skills in the acute stages of illness.

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## 1. Introduction

Despite recent advancements, the psychological processes associated with Anorexia Nervosa (AN) remain poorly understood and, therefore, effective treatments for the disorder continue to be elusive [1,2]. Treatments developed out of traditional cognitive behavioral models of eating disorders have been demonstrated to be of limited efficacy in treating individuals with AN [1,3]. As such, within recent years researchers have been attempting to develop novel models by which to understand the phenomenology of AN.

One such model is that proposed by Haynos and Fruzzetti [4], which posits the central role of emotion regulation deficits in AN. According to this model, individuals with AN experience deficits in the ability to identify, understand, and modulate emotions, which results in an experience of emotions as overwhelming or unmanageable. Consequently, individuals with AN rely on disordered eating to regulate their affective state by reducing negative affect and/or increasing positive affect. Thus, the model proposes that disordered eating is maintained through reinforcement associated with momentary alterations in emotional states. In line with this hypothesis, studies have found that individuals with AN have more difficulties with emotion regulation than healthy controls and similar emotion regulation difficulties as individuals with mood, anxiety, and personality disorders [5–10]. Studies using ecological

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momentary assessment have found that changes in negative affect frequently precede restrictive eating and excessive exercise for individuals with AN [11], suggesting that these behaviors may function to manage aversive emotional experiences. Finally, research suggests that emotion regulation abilities do not significantly improve with traditional inpatient treatment for AN [12] and that emotion regulation deficits following treatment for AN are associated with long-term perpetuation of disordered eating [13], potentially explaining the failure of traditional cognitive behavioral treatments for AN.

Although there is growing evidence supporting the idea that emotion regulation difficulties affect eating disorder symptoms in AN, few studies have examined the relationship between emotion regulation and other putative processes related to AN. There is concurrently increasing interest in the role that anxiety plays in influencing AN symptomology [14,15]. It has been suggested that individuals who develop AN have elevated levels of anxiety resulting from a dysfunctional serotonin system, and that restrictive eating serves to reduce baseline levels of anxiety to a more manageable level [16]. Though there is considerable overlap between anxiety and emotion regulation models, anxiety models differ from that outlined by Haynos and Fruzzetti [4] in two main ways: 1) They place primacy on anxiety as the sole (or main) problematic emotional experience in AN, rather than identifying a wide array of problematic emotional experiences as relevant to AN; 2) They place emphasis on an elevated baseline level of anxiety as the primary problem associated with disordered eating, while emotion regulation theories suggest the inability to effectively regulate emotion, rather than the emotion itself, as the primary concern.

The relationship between emotion regulation problems and anxiety among individuals with AN has rarely been explored; therefore, it is unclear how much emotion regulation difficulties contribute uniquely to eating disorder symptoms and clinical impairment caused by these symptoms, independent of anxiety concerns. One study found that both anxiety and emotion lability uniquely predicted eating disorder symptoms in an AN sample, however only emotion lability specifically predicted restrictive eating, suggesting an independent contribution of emotion regulation difficulties to disordered eating [17]. However, more research is needed to determine the degree to which emotion regulation difficulties exert influence on eating disorder severity that is not solely attributable to the impact of elevated baseline anxiety. Additionally, the interaction between anxiety and emotion regulation on eating disorder severity in AN has not been explored. Thus, it remains unclear whether these processes independently contribute to eating disorder pathology or whether they interact in nuanced ways to affect eating disorder symptoms (e.g., individuals with AN who have higher anxiety are more vulnerable to consequences of emotional dysregulation).

In this study we examined the association between emotion regulation, anxiety, and the interaction of these

variables, with two indicators of eating disorder severity (i.e., eating disorder symptom severity and eating disorder-related clinical impairment) among individuals with AN. These associations were examined at admission to inpatient eating disorder treatment, at which time patients were in the acute stage of illness and underweight. The main hypotheses were as follows:

1. Emotion regulation difficulties would be significantly positively associated with eating disorder symptoms and clinical impairment, even after controlling for anxiety and relevant covariates.
2. There would be an additive effect of emotion regulation difficulties and anxiety on eating disorder symptoms and clinical impairment. High levels of both emotion regulation difficulties and anxiety would be associated with the greatest problem severity, while low levels of both would be associated with the lowest problem severity.
3. Emotion regulation difficulties would moderate the relationship between anxiety and eating disorder symptoms and clinical impairment. Anxiety would have a significant positive association with eating disorder symptoms and impairment when emotion regulation difficulties were elevated, but not when emotion regulation concerns were lower. It was theorized that poor emotion regulation would make individuals with AN more vulnerable to the impact of anxiety on eating disorder severity [4].

## 2. Methods

### 2.1. Participants

Participants were individuals with AN  $\geq 18$  years old ( $n = 63$ ) consecutively admitted to an inpatient eating disorder treatment program over a three-year period. A power analysis conducted using G-Power software [18] was conducted to determine whether this sample size was adequate, assuming an alpha level of 0.05 and sufficient power (80%) to detect a large effect size ( $f^2 = 0.35$ ) with seven predictor variables. Power analysis suggested that the sample size in this study ( $n = 64$ ) exceeded the minimum suggested sample size ( $n = 49$ ). Diagnosis of AN was established by the Structured Clinical Interview for DSM-IV (SCID-I) [19]. Participants completed questionnaires at inpatient admission. Procedures were approved by an institutional review board and participants provided informed consent for the use of assessment data for research purposes.

### 2.2. Measures

#### 2.2.1. Independent variables

The Difficulties in Emotion Regulation Scale (DERS) [20] was used to examine problems with emotion regulation. The DERS is a 36-item scale developed to assess multiple facets of emotion regulation, including abilities to identify, differentiate, and accept emotional experiences, engage in

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