



# Hoarding and eating pathology: The mediating role of emotion regulation

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## Abstract

Hoarding disorder is characterized by persistent difficulty discarding possessions resulting in clutter that precludes one from using living areas for their intended purposes. The limited empirical work available has suggested a strong link between hoarding and various non-psychiatric conditions, including obesity. Despite these associations, no research has examined the link between hoarding and other forms of eating pathology including symptoms associated with binge eating. Moreover, little is known about mechanisms that may account for this relationship. The current study examined the associations between hoarding severity, obesity, and symptoms associated with binge eating in a sample ( $N = 97$ ) of individuals with elevated hoarding symptoms. Results revealed that hoarding severity was associated with increased body mass index (BMI) and symptoms of binge eating. In addition, difficulties regulating emotions mediated the association between hoarding and eating concerns. Considering the lack of information on hoarding behaviors, as well as its classification as a new diagnosis within DSM-5, these findings add considerably to a growing body of literature on hoarding disorder.

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## 1. Introduction

Hoarding disorder is a complex clinical phenomenon characterized by excessive saving behaviors and clutter that precludes the use of living spaces for their intended purposes [1]. Individuals who hoard experience marked impairment in numerous areas of functioning including social, occupational, and domestic domains [2,3]. This impairment includes but is not limited to controversy with family and friends over clutter, sanitation problems, and an inability to perform day-to-day activities such as preparing food, paying bills, or even working [4]. As a consequence of their inability to maintain a safe and sanitary home, hoarders have also been found to be at increased risk for several severe health conditions as well as increased medical care utilization [2].

One health-related condition that has shown high rates of comorbidity with hoarding is obesity. Obesity is a common and problematic condition in the United States. Recent studies have estimated obesity to be prevalent in just over one third of US adults [5], and nearly 1 in every 5 US children [6]. The negative effects of obesity are wide-reaching, from increased risk of physical disability [7], to poor emotion regulation [8], and poorer health- and mental-

related quality of life [9]. In addition to health-related concerns, obesity has also been associated with higher rates of eating pathology including binge eating disorder (BED) (for review, see [10]). Furthermore, individuals with BED are more likely to experience comorbid psychopathologies, such as mood and anxiety disorders [11–13].

Apart from physical health, a considerable body of research has examined the link between obesity and psychopathology. For example, the relationship between obesity and depression [14,15], as well as obesity and suicide [16–18] has been well supported in the literature. Often comorbid with depression, current and life-time anxiety disorders are similarly associated with obesity [19,20]. Looking to isolate specific relationships, Simon and colleagues [21] demonstrated a positive “dose–response” relationship between body mass index (BMI) and higher rates of major depressive disorder (MDD), panic disorder, and agoraphobia. Scott, McGee, Wells, and Browne [19] found that obesity was significantly associated with mood and anxiety disorders, with stronger associations between obesity and anxiety disorders when adjusting for comorbidity between the two psychopathologies. Taken together, these findings demonstrate a strong association between obesity and various mental health conditions.

More recently, the associations between obesity and hoarding disorder have also been examined. For example, Tolin, Frost, Steketee, Gray and colleagues [2] compared

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BMI among a large sample of individuals with hoarding disorder ( $N = 864$ ) and their family informants and found that hoarding participants were nearly three times as likely to be overweight or obese as their non-hoarding family member. Timpano, Schmidt, Wheaton, Wendland, and Murphy [22] extended this research by examining the role of the BDNF gene in relation to hoarding and obesity. The authors found that the Val/Val genotype was associated with greater levels of hoarding severity as well as increased BMI levels and obesity status. Despite this evidence for an association between hoarding severity and obesity, no research to date has examined if hoarding is related to other forms of eating pathology such as symptoms of binge eating. Given previous research demonstrating associations between obesity and binge eating [10], as well as associations between binge eating and various forms of psychopathology [12], it is reasonable to assume that hoarding may be associated with symptoms of binge eating.

It is also currently unclear what mechanisms may account for the relationship between hoarding and eating concerns. One promising factor that may help to explain the co-occurrence between hoarding and disordered eating is emotion dysregulation. Emotion dysregulation has been defined as difficulties with the ability to understand and differentiate emotions, as well as difficulties modulating emotions [23]. Specifically, emotion dysregulation is composed of several facets, reflecting problems with: 1) awareness and understanding of emotions, 2) acceptance of emotions, 3) control of impulsive behaviors and achievement of goals when distressed, and 4) use of appropriate emotion regulation strategies to modulate emotional responses [23]. Emotion dysregulation has been proposed to contribute to several psychiatric disorders because it may exacerbate negative emotional states by leading to increased physiological arousal, distress, and avoidance [24].

Recent cross-sectional research has indicated that individuals with hoarding disorder have higher levels of emotion dysregulation in comparison with healthy controls [25]. In addition, distress tolerance, a related but separate construct reflecting one's ability to withstand negative emotional states, has been found to predict hoarding symptom severity in nonclinical samples [26,27]. Previous researchers have hypothesized that emotion dysregulation may play a role in specific features of hoarding disorder, particularly difficulty discarding and acquiring. For example, individuals with difficulties in regulating their emotions may delay or neglect discarding possessions to avoid the negative emotions that are associated with this act, as they may feel these negative emotions are overwhelming or uncontrollable [25]. In addition, acquiring has been conceptualized as a maladaptive attempt to regulate one's positive and negative emotions [28], which could be particularly problematic in the context of a lack of more adaptive emotion regulation strategies. Consistent with this notion, when examining the hoarding subscales separately Timpano and colleagues [27] found that difficulty discarding and acquiring, but not clutter, were

associated with both self-report and behavioral indices of emotion dysregulation.

Emotion dysregulation has also been linked to disordered eating. Specifically, emotion dysregulation is associated with binge eating among undergraduates above and beyond several covariates such as sex, food restriction, and over-evaluation of weight and shape [29]. These associations have also been found in clinical samples of individuals who were obese and diagnosed with binge eating disorder, with difficulties in emotion regulation accounting for additional variance in emotional overeating and general disordered eating after covarying for sex and negative affectivity [30]. It is likely that individuals with emotion regulation difficulties may be more vulnerable to disordered eating such as binge eating to cope with negative emotions because they lack more adaptive ways to regulate their emotions [30,31]. Given the associations between emotion dysregulation, hoarding disorder, and disordered eating, it is plausible that emotion dysregulation may underlie the relationship between hoarding disorder and obesity as well as disordered eating.

The purpose of the proposed study was to examine the relationship between hoarding severity and eating pathology and the potential mediating role of emotion dysregulation. In an effort to replicate previous research, we first examined the relationship between hoarding severity and BMI. Consistent with the limited empirical work available, it was hypothesized that increased BMI would be associated with increased levels of hoarding severity. Second, we examined the relationship between hoarding severity and symptoms associated with binge eating disorder. Once again, it was hypothesized that increased hoarding severity would be associated with increased symptoms of binge eating. Third, we examined the associations between BMI, binge eating symptoms and specific facets of hoarding (i.e., acquiring, difficulty discarding, and clutter). Given previous research suggesting that the act of acquiring and difficulty discarding are attempts to regulate one's emotions, it was hypothesized that BMI and symptoms of binge eating would be most associated with these facets. Finally, mediation procedures were used to test the hypothesis that difficulties regulating emotions would mediate the relationship between hoarding severity and increased BMI as well as eating pathology.

## 2. Methods

### 2.1. Participants and procedure

Participants were recruited through Amazon's Mechanical Turk (Mturk), an online crowdsourcing marketplace. Data collected through Mturk are diverse and high in quality [32,33] and typically consist of individuals that are predominantly educated, underemployed, middle class, Caucasian, and approximately 30 years old [34,35]. The current survey was made available to individuals living in the United States that were over 18, who demonstrated high

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