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An examination of emotional and loss-of-control eating after sleeve gastrectomy surgery☆

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ABSTRACT

Emotional eating has been identified as a predictor of poorer weight loss outcomes in non-bariatric clinical samples. It is unknown, however, whether emotional eating contributes to poorer weight loss outcomes after bariatric surgery or how it might be associated with loss-of-control (LOC) eating, a known predictor of post-surgical outcomes. This study examined the nature and significance of emotional eating among post-bariatric surgery patients with LOC eating. Participants (N = 134) were patients with LOC eating (at least once weekly) seeking treatment to help improve eating approximately 4–9 months following sleeve gastrectomy surgery. Participants were assessed with the Eating Disorder Examination-Bariatric Surgery Version interview, Yale Emotional Overeating Questionnaire, and Beck Depression Inventory-II. Emotional eating and LOC eating were significantly negatively correlated with post-surgical weight loss (p's < 0.05), both variables had a small effect. Linear regression analyses revealed that both emotional eating and frequency of LOC eating were independently associated with weight loss ($R^2 = 0.041$ and 0.049, respectively). Our findings suggest that, among post-sleeve gastrectomy patients with LOC eating, greater frequency of LOC eating and LOC eating in response to emotions are associated with poorer weight outcomes.

1. Introduction

Emotional eating refers to the tendency to eat in response to negative emotions, such as sadness, fear, and anger (Arnow, Kenardy, & Agras, 1995; Van Strien, Rookus, Bergers, Frijters, & Defares, 1986). Emotional eating has been identified as a predictor of poorer weight loss outcomes in (non-surgical) clinical and community samples (Koenders & van Strien, 2011; Niemeier, Phelan, Fava, & Wing, 2007; Ricca et al., 2010). It is unknown, however, whether emotional eating contributes to poorer weight loss after bariatric surgery or how it might be associated with loss-of-control (LOC) eating. LOC eating is defined as a subjective sense of loss-of-control while eating (regardless of the amount consumed), difficulty stopping eating, or difficulty preventing oneself from eating. Research has found that post-surgical LOC eating is a significant predictor of poorer post-surgical outcomes (White, Kalarchian, Masheb, Marcus, & Grilo, 2010).

A review of eating behavior following bariatric surgery found that post-surgical disordered eating (i.e., binge or LOC eating, grazing, sweet eating, emotional eating, and nocturnal eating) predicted poorer weight loss outcomes, with binge/LOC eating appearing to have the strongest support (Sheets et al., 2015). Post-operative LOC eating was found to be a significant predictor of greater weight regain two years after gastric bypass and gastric banding procedures (Conceicao et al., 2017). Similarly, having a current eating disorder was associated with less weight loss 2 and 3 years after gastric bypass and gastric banding procedures (Kalarchian et al., 2016). Few studies, however, have evaluated post-surgical emotional eating within the bariatric population. The majority of postoperative emotional eating studies considered by Sheets et al. (2015) were excluded because of small sample sizes and insufficient follow-up. A more recent review examined changes in eating behaviors pre- and postoperatively and identified a total of nine studies evaluating emotional eating, the majority of which were conducted among those who received Roux-en-Y gastric bypass (RYGB, n = 7; Opozda, Chur-Hansen, & Wittert, 2016). Overall, the available research provided consistent evidence of significant reductions in emotional eating after RYGB and limited evidence after adjustable

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gastric band, but no studies examined emotional eating following sleeve gastrectomy. Understanding post-operative eating behavior after sleeve gastrectomy is pertinent as it has recently become the most commonly performed bariatric surgery in the United States (Spaniolas et al., 2015). Moreover, emotional eating might contribute to poorer weight loss outcomes after sleeve gastrectomy. Thus, this research could inform whether emotional eating might be one possible target of treatment for disordered eating after surgery to improve post-surgical outcomes.

The association between post-operative emotional eating and weight outcomes in the bariatric population appears inconsistent and is limited by several factors related to the measurement of emotional eating itself. For instance, many studies report unclear criteria and/or utilize unvalidated instruments when assessing emotional eating (Opolski, Chur-Hansen, & Wittert, 2015; Opozda et al., 2016). Furthermore, the most commonly used validated measures of emotional eating often assess the 'urge' or 'need' to eat in response to emotions, rather than the occurrence or frequency of eating in response to emotions (Opolski et al., 2015). Likewise, difficulties in assessing binge/LOC eating in the bariatric population have been observed (Goldschmidt et al., 2016; Meaney, Conceicao, & Mitchell, 2014). For instance, post-surgical physical constraints may limit the amount of food that can be consumed at a given time after bariatric surgery and studies which have only assessed objective binge-eating episodes (defined as the consumption of "an unusually large amount of food") might underreport or overlook LOC eating in bariatric patients (Meaney et al., 2014).

The aim of this study was to examine the nature and significance of emotional eating among post-sleeve gastrectomy surgery patients with LOC eating. Although limited, given that the existing data suggests that emotional eating is associated with poorer weight loss in RYGB we hypothesized that more frequent LOC eating and emotional eating would be significantly related to poorer post-operative weight loss after sleeve gastrectomy surgery. Our study specifically examined the *frequency* of LOC eating in response to emotions, rather than the tendency or urge to eat in response to emotion, as well as associated eating disorder psychopathology and weight loss after sleeve gastrectomy.

2. Method

2.1. Participants

Participants were 134 individuals who were seeking treatment for eating concerns and reporting LOC eating (at least once weekly during the prior month) four to nine months ($M = 6.61$, $SD = 1.55$) following sleeve gastrectomy surgery. All participants underwent laparoscopic sleeve gastrectomy surgery at the Yale Bariatric/Gastrointestinal Surgery Center of Excellence. Participants were referred to the study directly from the bariatric team or responded to mailings or flyers soliciting patients with postoperative eating concerns. The assessments for this investigation were performed independently from the bariatric program. Participants were eligible if they were between the ages of 18 and 65 and reported LOC eating (defined as a sense of LOC while eating, difficulty stopping eating, or difficulty preventing themselves from eating) at least once weekly during the past four weeks regardless of the amount eaten. Exclusion criteria included use of any current medications known to influence weight or eating, substance dependence, or severe psychiatric illness that required immediate treatment. This study received approval from the Yale University School of Medicine Institutional Review Board and all participants provided written informed consent.

The majority of participants were female ($n = 114$; 85.1%) and 53% were White ($n = 71$), 35.1% were Black ($n = 47$), and 10.4% were Hispanic ($n = 14$). The mean age was 45.46 years old ($SD = 10.84$) and the mean current BMI was 37.7 kg/m^2 ($SD = 7.1$), while the mean pre-surgical BMI was 46.89 kg/m^2 ($SD = 8.89$).

2.2. Assessments

Participants were assessed with the Eating Disorder Examination-Bariatric Surgery Version (EDE-BSV), a semi-structured interview of eating disorder symptomatology and overeating behaviors, including objective binge-eating episodes (OBE; eating an unusually large amount of food and experiencing a subjective sense of LOC while eating) and subjective binge-eating episodes (SBE; LOC eating without eating an unusually large quantity of food), adapted for bariatric surgery patients (de Zwaan et al., 2010; Devlin et al., 2016; Mitchell et al., 2012). The EDE-BSV assesses the standard EDE questions related to LOC eating and yields a global score, as well as four subscales including restraint, eating concern, weight concern, shape concern, according to the standard procedures (range = 0–6) and higher scores reflect greater frequency or severity of eating disorder psychopathology. For this investigation, LOC eating frequency was determined by the sum of any LOC eating, regardless of the quantity, as opposed to some studies which have exclusively focused on the presence of OBEs or SBEs in the bariatric population (see Meaney et al., 2014 review for examples).

Participants completed the Yale Emotional Overeating Questionnaire (EOQ; Masheb & Grilo, 2006), a 9-item self-report measure. Items on the EOQ assess the frequency of overeating eating in response to various emotions (e.g., sadness, happiness) during the past 28 days on a 7-point Likert scale (0 = No days, 1 = 1–5 days, 2 = 6–12 days, 3 = 13–15 days, 4 = 16–22 days, 5 = 23–27days, 6 = Every day). For example, an EOQ score of 1.3 indicates overeating in response to emotion for 1–5 days during the past month, whereas a score 5.3 would indicate 23–27 days during the past month. For this investigation, the EOQ items were modified to assess the frequency of LOC eating, rather than overeating, in response to emotions, henceforth referred to as "emotional eating." Higher scores are indicative of greater frequency of emotional eating. The Cronbach's alpha obtained in the present investigation was 0.89. Participants also completed the Beck Depression Inventory-Second Edition (BDI-II; Beck, Steer, & Brown, 1996) to assess the presence and severity of depression symptoms. The Cronbach's alpha obtained in the present investigation was 0.93.

2.3. Height and weight

Weight was measured using a high-capacity digital scale and height was measured using a stadiometer. Current body mass index (BMI) was calculated using measured current weight and height. Pre-surgical BMI was calculated using measured pre-surgical weight and height. Weight change was calculated by subtracting the patients' current measured weight (lbs) from their pre-surgical measured weight (lbs). Percent excess weight loss (%EWL) and percent total weight loss (%TWL) were also calculated.

3. Data analysis

Frequencies of emotional eating and LOC eating were examined and bivariate correlations were conducted to examine the relationships between weight loss, LOC eating, emotional eating, depression, and eating disorder symptomatology. Linear regression analyses tested the joint and independent contributions of LOC eating and emotional eating in accounting for variance in weight loss. Three linear regression analyses were conducted to examine the impact of LOC eating on weight change, the impact of emotional eating on weight change, and last, both variables to examine the joint contribution on the impact on weight change.

4. Results

Participants reported an average of 20.73 ($SD = 19.36$) LOC eating episodes during the previous month and the average EOQ total score