



The food craving questionnaire-trait in a bariatric surgery seeking population and ability to predict post-surgery weight loss at six months

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ABSTRACT

Food cravings have been understudied in bariatric surgery patients and the Food Craving Questionnaire-Trait has not been validated in this population. Reliability and validity of the FCQ-T were examined and a regression analysis was run to determine whether or not preoperative scores on individual subscales of the instrument could predict weight loss at 6 months. The FCQ-T demonstrated excellent internal consistency in bariatric surgery-seeking patients, and individual subscales measuring emotion and mood were correlated with other measures of depression and anxiety. Endorsement of binge eating or emotional eating behaviors during a clinical interview was correlated with similar subscales on the FCQ-T. Higher scores on the subscale 'cues that may trigger food cravings' were associated with greater weight loss at 6 months post-surgery and higher scores on the subscale 'guilt from cravings and/or giving into them' was associated with less weight loss. Management of external cues may predict successful outcomes while emotional impact of cravings may indicate the need for further intervention to help manage specific food craving traits.

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1. Introduction

Bariatric surgery is increasing in popularity, with approximately 220,000 bariatric surgeries performed in the USA and Canada in 2008, and 344,221 done worldwide (Buchwald & Oien, 2009). While patients can be expected to lose approximately 61% of their excess body weight in the two years following their surgery, 30–50% of patients regain some or all of the weight they initially lost (Magro et al., 2008). Moreover, it is estimated that 20% of patients will regain all of the initially lost weight (Benotti & Forse, 1995). There is tremendous interest in discovering psychological characteristics that patients who present for bariatric surgery possess which may be related to weight loss outcomes. After many reviews of the literature, it remains unclear which preoperative factors can be assessed to predict successful weight loss outcomes.

Eating behavior disorders are suggested to be predictive of poor weight loss after bariatric surgery and binge eating disorder (BED) has been the primary eating disorder targeted. Preoperative rates of BED have been reported anywhere from 10% to 50% (Glinski, Wetzler, & Goodman, 2001; Kalarchian, Wilson, Brolin, & Bradley, 2000). There are mixed findings regarding the relationship between BED and weight loss after bariatric surgery. Some studies have found a relationship between preoperative binge eating and less weight loss or weight regain

within the first 2 years after gastric bypass (Hsu et al., 1998; Karlsson, Sjostrom, & Sullivan, 1998; Sallet et al., 2007). In the first six months after bariatric surgery, Dymek, le Grange, Neven, and Alverdy (2001) found that those with preoperative BED lost less weight than those without BED. However, several other studies have not found an association with binge eating and weight loss (Bocchieri-Ricciardi et al., 2006; Burgmer et al., 2009; Kinzl et al., 2006). Alger-Mayer, Rosati, Polimeni, and Malone (2009) conducted a prospective study to evaluate the predictive ability of the preoperative assessment of eating disorders. Patients with and without preoperative BED had similar weight loss at all time points up to six years after surgery.

Although binge eating disorder has been extensively studied within this population and has been shown to have mixed predictive ability in respect to post-surgical weight loss, other eating behaviors (i.e. food cravings) have not received as much attention. Examining other eating behaviors that are not necessarily disordered in nature, but that are more commonly occurring and are associated with negative eating related choices may allow researchers to identify new potential predictors of post-surgical weight loss. Food cravings are strong physiological or psychological desires that promote seeking and ingestion of a particular food (Cepeda-Benito, Gleaves, Williams, & Erath, 2000). Different from homeostatic hunger, food cravings are conceptualized as intense desires for specific foods that one makes extra efforts to obtain; while many foods can satisfy true hunger, only a specific food can satisfy a food craving (Pelchat, 2002; Rabinovitz, 2005). Food cravings have been linked to snacking, non-compliance with dietary restrictions and weight-loss

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programs, binge eating disorder, and obesity (Rabinovitz, 2005). Jarosz, Dopal, Wilson, and Schram (2007) suggest that episodes of overeating may be precipitated by food cravings and food-related cues. While binge eating may be physiologically difficult after a restrictive surgery, individual trait food cravings are stable characteristics and can be assessed at any time and would likely not be as impacted by a restrictive surgery.

The Food Cravings Questionnaire-Trait (FCQ-T) (Cepeda-Benito et al., 2000) measures how cravings are found in an individual at any given time. The instrument is a psychometrically sound measure of food cravings (Cepeda-Benito et al., 2000). The FCQ-T scales measure stable characteristics of craving, including intensions to eat, positive reinforcement, negative reinforcement, lack of control, preoccupation with food, feelings of hunger, negative affect, cue-dependent eating, and guilty feelings (Moreno, Rodriguez, Fernandez, Tamez, & Cepeda-Benito, 2008).

While the development and validation of the FCQ-T used a non-clinical population, Moreno et al. (2008) found similar psychometric properties in a clinical eating-disordered population. Jarosz et al. (2007) found that FCQ-T scores were significantly different in women with eating disorders compared to those without, and that obese women endorsing binge eating had the highest FCQ-T scores. Vander Wal, Johnston, and Dhurandhar (2007) used the FCQ-T in an overweight and obese population in a weight loss clinical trial to examine psychometric properties and found good to excellent internal consistency (.75–.93). Abiles et al. (2010) assessed food cravings with the FCQ-T in a sample of bariatric surgery candidates compared to a group of normal weight controls and found significantly higher scores on eight of the nine subscales in the surgery-seeking sample. However, this study utilized a small sample and did not address the potential predictive ability of the FCQ-T within this population. Moreover, while the reliability and validity of the FCQ-T has been assessed in a general, eating-disordered, and overweight population, no researchers have specifically evaluated its psychometric properties within a bariatric surgery seeking population.

Since obese individuals seeking weight loss surgery likely differ from those who do not elect to pursue surgical treatment, a comprehensive look at the FCQ-T in a large population of bariatric surgery-seeking individuals is warranted. The present study sought to examine the reliability and validity of the FCQ-T in a bariatric surgery seeking population. To assess reliability, the present study proposed to examine the structure of the measure using confirmatory factor analysis and to assess the internal consistency of the subscales. The study examined the validity of the measure by examining correlations between the subscales of the FCQ-T and related measures of depression, anxiety, and problematic eating behaviors. It was hypothesized that higher levels of depression and anxiety would be associated with higher scores on the FCQ-T, particularly on the subscales associated with emotions ('anticipation of positive reinforcement that may result from eating,' 'anticipation of relief from negative states and feelings as a result of eating,' 'emotions that may be experienced before or during food cravings or eating,' and 'guilt from cravings and/or giving in to them'). It was also hypothesized that higher scores on the FCQ-T and its subscales would be related to more problematic eating behavior (consistent with the past research by Jarosz et al., 2007). Finally, the present study sought to investigate the predictive ability of the FCQ-T by assessing the relationship between pre-surgical FCQ-T scores and weight loss outcomes at six months post-surgery. It was hypothesized that individuals with higher total scores on the FCQ-T and its subscales would have lower overall weight loss at six months following surgery.

2. Methods

2.1. Participants

One hundred and thirty-eight bariatric surgery candidates underwent comprehensive pre-surgical psychological evaluations to assess readiness for surgery (30 men, 108 women). One hundred and twenty of these

candidates were approved for surgery and went on to have gastric bypass surgery, sleeve gastrectomy, or adjustable gastric banding surgery. At the time of their psychological evaluations, patients averaged 46.67 (SD = 12.84) years of age. The ethnic makeup of the sample was approximately 66.7% Caucasian, 32.6% African American, and .8% another ethnicity. Ninety-three participants had gastric bypass surgery (78%), 12 had sleeve gastrectomy (10%), 13 had adjustable gastric banding (11%), and 2 had a repair or a revision (1% - gastric banding to bypass after failure due to band slippage or lack of weight loss). The average BMI was 49.96 kg/m² (SD = 10.82). Six-month follow-up data on post-surgical outcomes were available for 84 patients (70% of the sample). There were no statistically significant pre-surgical differences between those patients with follow-up data and those without for demographic variables, weight pre-surgery, and scores on the FCQ-T, BAI, or CES-D.

2.2. Procedure

All patients seeking bariatric surgery underwent a three-hour psychological evaluation conducted by a psychologist which included a semi-structured clinical interview assessing various aspects of their past and present functioning as well as a battery of relevant questionnaires assessing different aspects of psychopathology. Current clinical practice at the center includes the following questionnaires: Food Craving Questionnaire-Trait (Cepeda-Benito et al., 2000), the Center for Epidemiological Studies – Short Depression Scale (Andresen, Malmgren, Carter, & Patrick, 1994), and the Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988). Other measures unrelated to anxiety, depression, and food cravings were not included in this analysis.

Upon completion of the psychological evaluation, patients met with a registered dietitian who measured the patients' pre-surgical weight and calculated each patient's ideal body weight and excess weight (the difference between current and ideal body weight). Ideal body weight is calculated using the Hamwi equation for ideal body weight: adult females' ideal body weight is 100 pounds plus 5 pounds for each inch over 5 feet tall and adult males' ideal body weight is 106 pounds plus 6 pounds for each inch over 5 feet tall (Hamwi, 1964). At each follow-up appointment, the patient's height and weight were measured and percent excess body weight lost was recorded.

2.3. Measures

2.3.1. The Food Craving Questionnaire-Trait

(FCQ-T; Cepeda-Benito et al., 2000) is a 39-item measure assessing different aspects of food cravings including physiological and psychological variables. The measure has been factor-analyzed yielding the following nine subscales: 'having intentions and plans to consume food' (plans), 'anticipation of positive reinforcement that may result from eating' (positive reinforcement), 'anticipation of relief from negative states and feelings as a result of eating' (negative reinforcement), 'lack of control over eating' (loss of control), 'thoughts or preoccupation with food' (food concern), 'craving as a physiological state' (hunger), 'emotions that may be experienced before or during food cravings or eating' (emotions), 'cues that trigger food cravings' (context), and 'guilt from cravings and/or giving in to them' (guilt). Respondents rate the frequency in which they experience food cravings on a six-point Likert Scale, ranging from 1, "never/not applicable" to 6, "always" (Vander Wal et al., 2007). Scores range from 39 to 234. The overall scale has been shown to have a high (Cronbach's $\alpha = .92$) and the subscales themselves have also demonstrated high α s.

2.3.2. The Center for Epidemiological Studies – Short Depression Scale

(CESD-10; Andresen et al., 1994; Radloff, 1977) is composed of 10 items that assess severity of depressive symptomatology. Respondents rate the frequency with which they experienced the suggested symptoms, during the past week, on a four-point Likert Scale, ranging from "rarely or none of the time" to "most of the time." Scores range

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