



## Research report

## Explaining the role of binge eating behaviour in weight loss post bariatric surgery

Kerry V. Wood\*, Jane Ogden

Department of Psychology, University of Surrey, Guildford, Surrey GU2 7XH, England, UK

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## ABSTRACT

The current study aimed to examine the role of binge eating (BE) in explaining weight loss in patients undergoing laparoscopic adjustable gastric banding (LAGB) for severe obesity. Participants were 49 patients (13 males and 36 females) who completed questionnaires two weeks prior and three and six months after their operation. Predictor measures of weight loss included pre and postoperative BE and changes in BE following surgery. A decrease in BE as a consequence of having surgery was able to significantly predict postoperative weight loss. Many surgical services currently screen patients for BE at baseline to identify those most suitable for surgery. This study suggests that this process may be redundant as the results indicate that it is not the presence of BE pre- or post-operatively which are predictive of treatment-induced weight loss, but whether patients' BE behaviours decrease or persist in response to surgery. Future research therefore should seek to identify predictors of decreased BE following surgery in order to enhance candidate selection and improve the efficacy of this form of obesity management.

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## Introduction

The prevalence of obesity in the UK, similar to countries across the world, continues to rise. The proportion of the population that is obese has grown by almost 400% in the last 25 years and by 2015 it is estimated that more than 700 million people will be obese (World Health Organisation, 2003). Although many different behavioural and pharmacological interventions are available to treat obesity, few offer long-term success (Davidson et al., 1999; Jones, Smith, Kelley, & Gray, 1995). Thus, bariatric surgery has become a popular treatment for obesity, especially in individuals with severe obesity who have tried conventional weight loss techniques and failed. However, although surgery has a high success rate in comparison to behavioural weight loss interventions, unfortunately, a number of patients, up to 20%, fail to lose a significant amount of weight postoperatively (Brolin, Kenler, Gorman, & Cody, 1999; Hsu et al., 1998). As a result researchers have sought to identify psychological and behavioural predictors of treatment-induced weight loss with the aim of improving treatment efficacy. Our study is based on a 6 month follow up of a surgical intervention, laparoscopic adjustable gastric banding (LAGB), the objective being to investigate the role binge eating (BE) behaviours play in weight loss post bariatric surgery.

To date, much research has focused on eating behaviours such as BE, described as the consumption over a discrete period of time of an amount of food that is 'definitely larger' than most people would eat in the same period of time under similar circumstances.

It is thought to be associated with negative emotional states (Greeno, Wing, & Shiffman, 2000) as well as successful weight loss outcomes, however, its role in weight loss in patients undergoing bariatric surgery is controversially discussed in the literature. Some studies have found that higher preoperative levels of BE predicted poorer weight loss (e.g. Hsu, Sullivan, & Benotti, 1997), whereas others have found no evidence to support this (Bocchieri-Ricciardi et al., 2006; Powers, Perez, Boyd, & Rosemurgy, 1999; White, Masheb, Rothschild, Burke-Martindale, & Grilo, 2006) and some have even found better weight loss outcomes (e.g. Latner & Wilson, 2002). In addition, studies have reported that BE behaviours can continue or develop postoperatively affecting weight loss outcome (Hsu, Betancourt, & Sullivan, 1996; Scholtz et al., 2007) whereas others report a decrease or disappearance following surgery (Colles, Dixon, & O'Brien, 2008; Powers et al., 1999; White et al., 2006). Such conceptions may be the result of methodological issues such as poor study design, measurement error or sampling errors due to problems with sample sizes or may indicate that the role of eating behaviours in individuals undergoing obesity surgery is more complex than first thought. Due to the large number of studies already conducted in this area, replicating such work seems pointless, instead it seems worthwhile to look beyond the role of these behaviours as being static predictors.

A change in BE behaviour has been found to be associated with post treatment weight loss in a sample of individuals undergoing a behavioural weight loss programme (Presnell, Pells, Stout, & Musante, 2008). This study found that pre-treatment elevations in BE behaviour predicted significant decreases in BMI post treatment. Moreover, surgery has been found to alter the importance individuals place on food by the enforced reduction in the capacity

\* Corresponding author.

E-mail address: [k.v.wood@surrey.ac.uk](mailto:k.v.wood@surrey.ac.uk) (K.V. Wood).

for food, leading to a shift in patients' relationship with food (Ogden, Clementi, Aylwin, & Patel, 2005). Consequently, it seems plausible to suggest that surgery facilitates a change in eating behaviour which is more predictive of weight loss success than pre or postoperative eating behaviour alone. The current study aimed to investigate this idea by employing changes in BE behaviour as a consequence of surgery as a predictor. Such information may help elucidate the nature of the associations between BE and weight loss and may account for some of the inconsistent findings observed in the literature. Measuring changes in BE behaviour as a result of surgery as a predictor of weight loss is an original contribution of this study.

## Method

### *Participants and procedure*

Forty-nine individuals (13 male and 36 female) were recruited from several private hospitals in Kent where they were scheduled to undergo LAGB. The mean age of the study sample was 41.35 years ( $SD = 10.4$ ; range = 21–61). Of the participants, 89.9% were Caucasian, 4.1% were mixed race, 4.1% were black and 2% Indian. Surgical indications were a BMI  $\geq 40$  kg/m<sup>2</sup> or a BMI of 35–40 kg/m<sup>2</sup> with serious comorbidity. The study protocol was approved by the research and ethics committees of the University of Surrey and the private hospitals. Treatment of participants was in accordance with the ethical standards of the American Psychological Association (American Psychological Association, 2010). The patients had given signed informed consent before participating. Two weeks before undergoing surgery participants completed preoperative measures. Three and six months later follow up questionnaires were sent to participants at their home address with a stamped address envelope in which to return them.

### *Measures*

Demographics, weight, height and BE were measured preoperatively. Weight and BE were assessed again at 3 and 6 months postoperatively. Preoperative height and weight were measured by the researcher. Weight was measured in light clothing and without shoes on a digital scale. Participants measured and reported their postoperative weights at three and six months. BMI was calculated by dividing weight (kg) by height<sup>2</sup> (metres).

### *Binge eating*

Binge eating was assessed with the Eating Disorders Diagnostic Scale (EDDS; Stice, Telch, & Rizvi, 2000). The EDDS is a 22-item self-report scale intended to assess the DSM-IV (American Psychiatric Association, 1994) criteria for anorexia nervosa, bulimia nervosa and binge eating disorder (Stice, Fisher, & Martinez, 2004; Stice et al., 2000). This measure is well validated and reliable, exhibiting validity with interview-based diagnoses, convergent validity with risk factors for eating pathology, and internal consistency (Stice et al., 2000). In order to make a diagnosis of DSM-IV binge eating disorder, items 5–18 were used from the EDDS. Items 1–4 and 19–22 were not included in our measures because they are measures of anorexia nervosa. Specific algorithms are provided for determining whether the participant meets diagnostic criteria for BED, which was used to determine the presence of BED. The alphas for BE behaviour at all three measurement points were  $>0.6$ .

### *Statistical analysis*

A change score for BE was computed by subtracting preoperative BE score from 3 month postoperative BE score. Scores for postoperative weight loss at 3 months were calculated by subtracting 3 month postoperative BMI from preoperative BMI, and scores for weight loss at 6 months were calculated by subtracting 6 month postoperative BMI from preoperative BMI. Descriptive statistics and correlations for weight, preoperative BE, postoperative BE, change in BE and weight loss were computed and analysed. Due to the small sample size, correlations were screened and only used for the regression analyses if they showed a significant correlation with weight loss. Preoperative BE scores were not significantly related to weight loss and were therefore omitted from the regression analyses. Two multiple regressions were performed to assess the predictive value of postoperative BE and change in BE on (1) 3-month post-surgery weight loss and (2) 6-months post-surgery weight loss. With Cronbach's alphas above .60, all scales' scores showed acceptable reliability (Nunnally & Bernstein, 1994).

## Results

### *Preliminary analyses*

A total of 43 participants (87%) completed 3-month postoperative measures and a total of 33 participants (67%) completed 6-month postoperative measures. Attrition analyses indicated that participants who did not complete postoperative measures did not differ significantly from those who provided data on any of the variables considered in this study at baseline.

### *Predictors of weight loss*

Correlational analyses revealed a significant positive correlation between postoperative BE and weight loss at six months and a significant positive correlation between a change in BE and weight loss at six months (see Table 1). Consequently, multiple regression analyses were used to assess the predictive ability of postoperative BE and change in BE (Table 2).

At three months, postoperative BE and change in BE were not significant predictors of weight loss. However, at six months, postoperative BE and change in BE were able to predict 19% of the variance in weight loss. Unlike change in BE, postoperative BE was not a significant predictor of weight loss (see Table 2). Notably, the relationship between change in BE and weight loss at 6 months postoperatively was negative, i.e. suggesting better weight loss outcome for those who showed a decrease in BE behaviour following surgery.

## Discussion

The present study aimed to examine the role of BE behaviour in weight loss post LAGB. The major finding of this study was that change in BE behaviour following surgery was a significant predictor of postoperative weight loss, specifically, a decrease in BE as a consequence of surgery resulted in greater weight loss success at six months postoperatively. In agreement with other studies assessing the effects of maladaptive eating behaviours on weight loss outcome, e.g. (Bocchieri-Ricciardi et al., 2006; White et al., 2006; Powers et al., 1999), pre and postoperative BE were unable to significantly predict weight loss at three and six months postoperatively.

Taken together, our findings suggest that BE behaviours do play a role in weight reduction in patients undergoing LAGB but the role is more complex than simply using pre- and post-operative BE

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