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Research report

Self-efficacy after bariatric surgery for obesity. A population-based cohort study☆

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ABSTRACT

Background: Eating behaviors often predict outcomes after bariatric surgery, and in this regard, self-efficacy has been shown to predict long-term behavior. We examined current eating self-efficacy in post-bariatric surgery patients comparing them to obese non-surgery patients to determine whether weight loss is associated with increased self-efficacy in post-bariatric surgery patients. *Methods:* We performed a population-based study of patients evaluated for Roux-en-Y gastric bypass and administered a survey using the Weight Efficacy Lifestyle (WEL) Questionnaire. There were 148 surgical and 88 non-operative patients who responded. Overall WEL score was assessed using linear regression models. Predictors of an increased self-efficacy score were also examined. *Results:* Follow-up was 4.0 and 3.8 years in the operative and non-operative groups, respectively. Operative responders were slightly older and had a lesser BMI compared to non-responders, otherwise the demographics were similar. Difference in overall WEL between groups was 25.5 ± 5.3 points on a 0–180 scale. A 25% change in weight was associated with a difference of 15.4 points on the total WEL between groups. Current self-efficacy scores were highly related to weight loss and correlated to quality of life at follow-up ($\rho = 0.36$). *Conclusion:* Profound weight loss after bariatric surgery is associated with increased eating self-efficacy in a population of obese adults seeking medical treatment for obesity.

Introduction

Obesity is a substantive public health problem with national surveys demonstrating an alarming four-fold increase in prevalence obesity over the past three decades (Chambers, Guo, Siervogel, Hall, & Chumlea, 2002; Gregg et al., 2005). In addition to global financial implications, patients with obesity are at increased risk of medical co-morbidity and psychiatric illness (Gregg et al., 2005) both of which can affect adversely social functioning, coping abilities, and quality of life (Chambers et al., 2002). The health improvements associated with bariatric surgery, an approved treatment for obesity, have been well established (Buchwald et al., 2004). However, while at many bariatric centers patients undergo substantial psychological management both pre- and post-operatively to ensure maintenance of long-term weight loss, the psychological changes associated with having had bariatric surgery have not been well documented.

Self-efficacy is an individual's confidence in their ability to execute a behavior in the face of perceived obstacles or challenging situations (Bandura, 1977). Self-efficacy is an important factor in the social-cognitive framework that has been shown to be predictive of long-term maintenance of weight loss (DePue, Clark, Ruggiero, Medeiros, & Pera, 1995). An extensive literature demonstrates the importance of self-efficacy in predicting behavioral change in such areas as tobacco dependence (Condiotte & Lichtenstein, 1981), cardiac rehabilitation (Bock et al., 1997), and exercise (Sullum, Clark, & King, 2000). This component of social-cognitive learning theory has been applied recently to obese patients in their attempts at weight loss. It has been proposed that

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individuals with low eating self-efficacy will be unable to resist temptation to overeat in a range of situations. Numerous studies have shown that obese patients will often engage in emotional overeating, binge-eating episodes (Cargill, Clark, Pera, Niaura, & Abrams, 1999) and/or fail to implement adequate modifications in lifestyle in the pursuit of weight loss. In contrast, improvements in self-efficacy after weight-loss therapies can often predict successful, long-term weight maintenance.

Self-efficacy changes over time, and weight-loss success should enhance self-efficacy, while weight regain should decrease eating self-efficacy. Obesity treatment should be beneficial in improving eating self-efficacy, and past research has documented improved self-efficacy scores after participation in several multidisciplinary weight-loss programs (Clark, Cargill, Medeiros, & Pera, 1996; Martin, Dutton, & Brantley, 2004; Pinto, Clark, Cruess, Szymanski, & Pera, 1999). Not surprisingly, obese binge eaters have a lower self-efficacy compared to obese non-binge eaters (Lloyd-Richardson, King, Forsyth, & Clark, 2000), and in support of a social-cognitive framework, eating self-efficacy improves after treatment for binge-eating disorder (BED) (Wolff & Clark, 2001). Despite the importance of self-efficacy in weight management, the impact of profound weight loss on long-term eating self-efficacy after weight-reduction (bariatric) surgery has not been well examined. In addition, the long-term implications of this operative treatment on eating self-efficacy, including changes in meal size, self-esteem, and social stigmatization, are all relatively unknown. We predicted that our population-based cohort of bariatric surgery patients would have greater eating self-efficacy scores than corresponding non-surgical patients, and that percent of weight loss would be positively associated with eating self-efficacy.

Methods

Study setting and data resources

All Olmsted County patients referred for bariatric surgery are seen in the multidisciplinary nutrition clinic at Mayo Clinic, Rochester, Minnesota. This study included all Olmsted County patients evaluated between January 1st, 1990 and October 31st, 2005, ensuring a minimum follow-up of one year. Olmsted County, Minnesota, is a relatively isolated rural area, 85 miles closest to the nearest city of >100,000 people. The Mayo Medical and Surgical Indices which catalogue all operations and visits at the Mayo Clinic were used to identify the study cohort. The Institutional Review Board approved this study, and all patients included in this study had granted permission for their medical records to be used for the purposes of clinical research.

Study cohort

849 Olmsted County residents were identified who were evaluated at the Mayo Nutrition Clinic for obesity and were seeking to have bariatric surgery for weight reduction. All patients were managed medically by endocrinologists, and they were also seen by nutritionists for dietary counseling, and by behavioral psychologists for lifestyle changes. A licensed dietician meets with patients for up to three visits within a six month time frame and counsels patients on healthier food choices and caloric restriction to avoid weight gain. Patients undergo an initial psychological assessment with the goals of being able to understand and comply with lifestyle change recommendations, identification of the risks for adjustment disorders following weight loss and for the presence of any psychiatric contraindications to bariatric surgery, such as a psychiatric evaluation for poorly controlled psychiatric disease or psychotropic medication assessment. Furthermore, all patients seeking to have bariatric surgery participate in the LEARN program (Lifestyle, Exercise, Attitudes, Relationships, and Nutrition) for 12–16 weeks. Patients also visit a physician 2–3 times over a six month period to assess their progress and problem solve solutions to any barriers they encounter. Such lifestyle and behavioral interventions continue post-operatively for the operative cohort and following completion of the initial 12–16 week LEARN program for the non-operative cohort. There were 389 patients who underwent Roux-en-Y gastric bypass surgery (RYGB) (Batsis et al., 2007) and 460 non-operative patients. All bariatric procedures occurred at St. Mary's Hospital, a tertiary care hospital that is part of Mayo Clinic. Participant flow is depicted in Fig. 1. The study exclusion criteria consisted of patients at baseline with the following: BMI < 35 kg/m^2, revisional bariatric procedures, consultations not-intended for bariatric surgery, age < 18 years, non-Olmsted County residents at either time-point, no research authorization, death, missing demographic information, patients unable to complete the survey due to language difficulties or physical incapacity, and patients with incomplete data or lost to follow-up. Non-operative patients were those who refused or were ineligible for surgical intervention and managed medically. In our routine practice, the non-operative patients are excluded for multiple reasons and not one particular criterion including the following: patient declined bariatric surgery, third-party payer denial, unclear expectations of the bariatric surgery, psychiatric difficulties, or lack of medical necessity. The final surgery cohort consisted of 268 patients and the final non-operative cohort was 273 patients.

Definitions

Information in the patient's medical record at the time of bariatric surgery or nutrition clinic consult in the operative and non-operative groups were considered baseline variables, while the most recent information in the medical record at the time of survey mailing constituted follow-up variables. Follow-up time was the difference between these two dates. Body mass index (BMI) was calculated by dividing weight (kg) by height (m^2). Excess weight was defined as the difference of the patient's measured weight and their ideal body weight (Robinson, Lupkiewicz, Palenik, Lopez, & Ariet, 1983). We used the carry-forward observation method for missing variables. Patients classified as depressed were those identified as taking medications for this indication. Cardiovascular disease was defined with ICD-9 codes 390-459.9, dyslipidemia as patients on medications for this indication or biochemical abnormalities suggestive of dyslipidemia; and hypertension if the patients were on medications for this indication or a blood pressure of ≥130/80 mmHg. Patients with diabetes mellitus included patients on medications, a fasting blood glucose ≥126 mg/dL, or HbA1c ≥6.5%.

Survey evaluation process + response rates

The Mayo Survey Research Center designed and coordinated the mailing of the 21-page survey. Two mailings, one in November 2006 and the second in December 2006, were performed with telephone follow-up between January and March 2007 using a standardized script for those who did not respond to the initial mailing. Surveys were re-mailed if subjects agreed. Data were coded and entered in duplicate by data specialists blinded to the study hypotheses. In the operative cohort, there were 151 (56.3%) positive responders overall, 41 (15.3%) refused, and 76 (28.4%) who did not respond to the survey request. The final operative cohort for data analysis consisted of 148 (55.2%) patients (Fig. 1). In the non-operative group, 88 (32.2%) were positive responders used in our data analysis. Non-operative non-responders consisted of 185 patients (67.8%).