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Original article

Preoperative predictors of adherence to dietary and physical activity recommendations and weight loss one year after surgery

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Abstract

Background: Weight loss and weight loss maintenance vary considerably between patients after bariatric surgery. Postoperative weight gain has partially been explained by lack of adherence to postoperative dietary and physical activity recommendations. However, little is known about factors related to postoperative adherence.

Objectives: The aim of this study was to examine psychological, behavioral, and demographic predictors of adherence to behavior recommendations and weight loss 1 year after bariatric surgery.

Setting: Oslo University Hospital.

Methods: In a prospective cohort study, 230 patients who underwent Roux-en-Y gastric bypass were recruited from Oslo University hospital from 2011 to 2013. They completed a comprehensive questionnaire before and 1 year after surgery. Weight was measured preoperatively, on the day of surgery, and 1-year postoperatively.

Results: Mean body mass index was 44.9 kg/m^2 (standard deviation [SD] = 6.0) preoperatively and 30.6 kg/m^2 (SD = 5.2) 1 year after surgery. Patients lost on average 29.2 % (SD = 8.2) of their initial weight. Predictors of dietary adherence were years with dieting experience, readiness to limit food intake, and night eating tendency. Preoperative physical activity and planning predicted postoperative physical activity whereas predictors of weight loss were higher frequency of snacking preoperatively, greater past weight loss, and lower age.

Conclusion: Several preoperative psychological predictors were related to postoperative adherence to dietary and physical activity recommendations but were not associated with weight loss. Interventions targeting psychological factors facilitating behavior change during the initial postoperative phase are recommended as this might improve long-term outcomes. (Surg Obes Relat Dis 2016;▮:00–00.) © 2016 American Society for Metabolic and Bariatric Surgery. All rights reserved.

Keywords: Bariatric surgery; Psychological factors; Weight loss; Adherence; Postoperative recommendations

Expected weight loss after Roux-en-Y gastric bypass is 25%–35% of initial weight [1,2], but weight loss and weight loss maintenance vary considerably between patients [1]. This variability is partially because of differences in adherence to dietary and physical activity recommendations, as the physiological changes obtained through surgery alone do not necessarily result in a positive long-term outcome [3]. Understanding postsurgical adherence behavior could help to optimize outcomes. The identification of presurgical predictors of adherence might point to viable targets for psychosocial interventions preparing patients for the requested lifestyle change after

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surgery [3]. Although initial postoperative weight loss is estimated to reflect the physiological effects from the surgery to a larger degree than psychological and behavioral factors [4], this period might be critical for initiating behavior change necessary for weight loss maintenance. Thus, studies examining the impact of preoperative psychological predictors of postoperative behavior as well as weight loss are needed [5].

Most patients reach maximum weight loss 1–2 years after surgery [1], but thereafter, some patients experience weight gain [2]. Except for physiological mechanisms, the most common reasons for postoperative weight gain are sedentary lifestyle and increased consumption of high-caloric food [6]. Qualitative studies have shown that patients tend to overestimate the effect surgery will have on weight loss, despite being provided with information about the value of making and sustaining dietary and physical activity changes postoperatively [7]. Many perceive surgery as an external measure to limit overeating, which does not primarily require effort for personal behavior change [8]. This implies that it is of great importance to identify individuals who are having difficulties changing their behavior in the initial period after surgery to intervene at an early stage [3].

Adherence to dietary and physical activity guidelines is associated with greater weight loss after surgery [9], but little is known about factors facilitating adherence [10]. Cognitive restraint and self-efficacy have been identified as predictors of dietary adherence [10,11]. Self-efficacy has also been related to patients' intention to adhere to postsurgical recommendations [12]; in particular, intention to be physically active predicts adherence [13]. Anxiety and depression have been associated with poorer dietary adherence [10,14]. Although preoperative physical activity is related to postoperative activity [15], evidence on the relationship between preoperative eating behaviors and postoperative adherence is inconsistent [16].

To extend the understanding of what facilitates bariatric surgery patients' adherence to behavior recommendations postoperatively, the present study was conducted based on data from the ongoing prospective Oslo Bariatric Surgery Study (OBSS). The man objective of OBSS is to identify psychosocial predictors for long-term weight maintenance by studying various factors involved in the self-regulation process, which refers to the ability to change one's behavior in line with one's goals [17]. The different variables (expectations, readiness to change behavior, planning, self-efficacy, self-esteem, body image, depression/anxiety, previous behavior, etc.) relevant for the self-regulation process can either facilitate patients' behavior change postoperatively or function as a barrier.

The aim of this study was to examine psychological, behavioral, and demographic factors as predictors of adherence to behavior recommendations and weight loss 1 year after bariatric surgery.

Methods

Participants and procedures

The patients were recruited at the Centre for Morbid Obesity and Bariatric Surgery at Oslo University Hospital, Norway, from February 2011 to September 2013. Patients aged 18–60 years with a body mass index (BMI) $\geq$40 kg/m^2 or $\geq$35 kg/m^2 and obesity-related co-morbidities who had failed at previous weight loss attempts were eligible for surgery. Patient flow is described in Fig. 1.

Nearly all the participants (95.7%) attended the clinical 1-year follow-up consultation. Most were women (78.3%), approximately one third (31.1%) had completed at least a 4-year college/university degree, the employment rate was 72.3%, and 58.9% were single. More than half (62.6%) had a BMI of 40–50 kg/m^2, whereas 20% had a BMI $>$50 kg/m^2 preoperatively.

Postoperative recommendations

The general postoperative behavioral recommendations are based on the Norwegian National guidelines for healthy diet and physical activity (PA) [18]. Patients are recommended to use whole grain products, eat 5 portions fruits and vegetables every day, choose meat and dairy products with less fat, and eat every 3 to 4 hours. PA of moderate intensity for a minimum of 150 min/week or vigorous PA for 75 min/week is recommended.

Measures

Weight was measured preoperatively on the operation day (T1) and at the follow-up consultation 1 year after surgery (T2) using a calibrated Seca 635, III (0–300 kg) platform scale with patients wearing light clothing and no shoes. Adherence to dietary recommendations was measured according to the dietary guidelines of the Norwegian Health Directorate [18], which the patients are recommended to follow in addition to the more specific nutritional management postoperatively (e.g., at least 60 g of protein daily, vitamin and mineral supplementation, etc.). Only the general dietary recommendations were included in the questionnaire. Patients were asked: "You have received recommendations regarding how/what to eat after surgery. To what degree does it correspond with how/what you have eaten the last 4 weeks?" (1 = little, 7 = a lot), followed by 6 specific recommendations (e.g., I eat 5 portions of fruit and vegetables every day; I limit my intake of sugar and fat, etc.) [18]. Dietary adherence was calculated as the composite score averaging across recommended dietary

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