



Original article

# A behavioral rating system predicts weight loss and quality of life after bariatric surgery

William Hilgendorf<sup>a,b,\*</sup>, Annabelle Butler<sup>a,b</sup>, Lava Timsina<sup>b</sup>, Jennifer Choi<sup>a,b</sup>,  
Ambar Banerjee<sup>a,b</sup>, Don Selzer<sup>a,b</sup>, Dimitrios Stefanidis<sup>a,b</sup>

<sup>a</sup> Indiana University Health North Hospital, Carmel, Indiana

<sup>b</sup> Indiana University School of Medicine, Indianapolis, Indiana

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## Abstract

**Background:** Bariatric surgery represents the most effective intervention for severe obesity available today; however, significant variability in postoperative outcomes exists. Effective tools that predict postoperative outcomes are needed for decision-making and patient counseling.

**Objectives:** We hypothesized that a validated behavioral assessment tool, the Cleveland Clinic Behavioral Rating Scale (CCBRS), would predict excess weight loss, health-related quality of life, depression, anxiety, and alcohol use after bariatric surgery.

**Setting:** Hospital in the United States.

**Methods:** A prospective observational study with 2-year planned follow-up was conducted with patients who completed a psychological clinical interview, the Short Form 36 (SF-36) v.2 Health Survey and brief self-report questionnaires measuring depression (PHQ-9), anxiety (GAD-7), and alcohol use (AUDIT) preoperatively. At the conclusion of the preoperative psychological evaluation, the psychologist completed the CCBRS. All questionnaires were readministered at 6, 12, 18, and 24 months after surgery. Generalized estimating equations were used to assess whether any CCBRS ratings predicted surgery outcomes.

**Results:** One hundred seventy-nine patients (113 Roux-en-Y gastric bypass and 66 sleeve gastrectomy) were included in the analyses. SF-36 scores, PHQ-9 scores, and the AUDIT total scores improved significantly after surgery, while GAD-7 scores did not change appreciably. Higher preoperative CCBRS ratings predicted higher SF-36 scores, and lower PHQ-9, GAD-7 and AUDIT scores. The CCBRS social support rating predicted higher postoperative percent excess weight loss.

**Conclusion:** A behavioral rating scale (CCBRS) completed before bariatric surgery predicted postoperative weight loss, quality of life, depression, and anxiety. Therefore, this tool may prove useful in patient counseling and expectation management before surgery. (Surg Obes Relat Dis 2018;000:1–6.) © 2018 American Society for Bariatric Surgery. Published by Elsevier Inc. All rights reserved.

## Keywords:

Bariatric surgery; Quality of life; Behavioral rating system; Social support; Obesity

\*Corresponding author at: Indiana University Health North Hospital, IU Health Bariatric Surgery & Medical Weight Loss, 11725 N. Illinois Street, Suite 350, Carmel, IN 46032.

E-mail address: [whilgend@iuhealth.org](mailto:whilgend@iuhealth.org) (W. Hilgendorf).

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Obesity continues to be of epidemic proportions, affecting as much as 12% of adults in the world, and is a major cause of erosions in quality of life [1,2]. Bariatric surgery has been well established as an effective and durable intervention for severe obesity and co-morbid conditions [3]. While there are prospective long-term studies that sug-

gest health-related quality of life (HR-QoL) improves after bariatric surgery [4], it has been noted that these improvements have generally been less well established compared with weight loss and co-morbidity improvement/resolution due to the variations in reporting of QoL [5]. Research on the impact of bariatric surgery on anxiety and depression has led to mixed findings. Based on a review and meta-analysis [6], the role of obesity in the cause of anxiety disorders is not fully established and may follow a course different from that of depression after bariatric surgery [7]. In recent years, there are data to show an increased risk for alcohol problems after bariatric surgery [8].

The psychosocial evaluation is an important part of the team effort to identify factors, which may affect optimal postsurgical outcomes [9], though which outcomes are most important can vary by discipline [10]. While efforts are made to identify the patients who are psychologically at risk before surgery, there is no algorithm to determine which patients may need additional preparation or even be denied. Just as the cause of obesity is multifaceted, contributions to successful weight loss postoperatively and subsequent weight regain are not well understood. Suspected behavioral and emotional contributions to poor outcomes have included binge-eating disorder [11], grazing [12], nonadherence to taking vitamins and adequate hydration [13], poor impulse control [14], lack of persistence [15], depression [16], and possibly alcohol use disorders (see Parikh et al. for a review [17]). One purpose of presurgical psychological evaluations presumably is to help predict probability for success; however, evidence for predictive validity is limited.

One of the more systematic approaches to the psychological evaluation is the Cleveland Clinic Behavioral Rating Scale (CCBRS) [18]. This is a clinician rating of the following 8 domains that can affect success and adjustment to bariatric surgery, plus an overall impression score: consent, expectations, social support, mental health, chemical/alcohol abuse/dependence, eating behaviors, adherence, coping/stressors.

The CCBRS ratings were hypothesized to be predictive of bariatric surgery outcomes. We hypothesized that patients who receive bariatric surgery will not only show significant weight loss by postoperative month 6 but also experience clinically meaningful improvements in HR-QoL and show reductions in anxiety and depression.

## Methods

### *Participants and procedures*

After the institutional review board approved the study, 380 patients were seen from October 2012 to October 2013 for their presurgical psychological evaluation. One of 2 psychologists performed all psychological evaluations using the instruments described in the measures section below and a diagnostic interview.

During the course of the psychological evaluation and chart review, it was determined if the patient met the inclusion criteria of being at least 18 years of age, fluent in English, cognitively able to give consent, and willing to participate. As a result, 314 patients were enrolled. Of these, 184 patients underwent bariatric surgery. Data from 5 patients were excluded because they were either revisions or band placement; therefore, the final analytical sample included data on 179 participants.

Weight, height, short form 36-item health survey (SF-36) v2, patient health questionnaire 9 item (PHQ-9), generalized anxiety disorder 7 item (GAD-7), and alcohol use disorders identification test (AUDIT) data were collected preoperatively and for 2 years postoperatively at an interval of 6 months during the patients' regularly scheduled clinic visit. Body mass index (BMI) was calculated using the standard formula: weight (kg) / [height (m)]<sup>2</sup>. We calculated percent excess weight loss (%EWL) as follows:

$$\%EWL = (\text{Initial weight} - \text{Postoperative weight}) / (\text{Initial weight} - \text{Ideal weight}) \times 100$$

Ideal weight was considered to be equivalent to each patient's weight at BMI=25 [5]. The preoperative BMI entered for each participant was taken on the day of the initial surgical consultation.

Of 181 patients, there were 126 (69.6%) with at least 1 follow-up visit in which data were collected. SF-36 v2 data were not used for that visit if there were any omitted responses. Approximately 39.2% of the patients were followed-up 6 months after surgery, 47.5% for 12 months after surgery, 31.5% for 18 months after surgery, and 22.7% for 24 months after surgery.

### *Measures*

The SF-36 [19] was chosen due to its broader relationship to co-morbidities associated with obesity [5]. It yields 2 component scores, the physical component score (PCS) and the mental component score (MCS). The PCS includes items assessing general health, mobility and self-care, pain, and the extent to which physical problems affect the ability to fulfill roles. The MCS has items assessing social functioning, vitality, emotional distress, and the extent to which mental health affects the ability to fulfill roles. The CCBRS [18] is shown to have internal consistency (Chronbach's alpha = .88) with good interrater reliability (r = .82) and was developed for use with preoperative psychological assessment of bariatric patients. The CCBRS includes the following 8 content areas plus one overall impression score: consent, expectations, social support, mental health, chemical/alcohol abuse/dependence, eating behaviors, adherence, coping/stressors, and overall impression were evaluated for all the patients in the sample. These areas were rated by the evaluating psychologist using a Likert scale ranging

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