Allied health article

Moving beyond dichotomous psychological evaluation: the Cleveland Clinic Behavioral Rating System for weight loss surgery

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Abstract

Background: Most bariatric programs require a preoperative psychological evaluation. The criteria for such decision-making and acceptance rates have been well described in published reports. Most programs have made categorical distinctions of accept, reject, or delay, although this limits utility.

Methods: Bariatric surgery candidates (n = 389; 77.1% women; 74.3% white; mean $\pm$ SD BMI 49.84 $\pm$ 11.51 kg/m^2) were evaluated using the CCBRS across 8 domains of interest in the psychological bariatric literature. Each domain was graded using a 5-point scale (poor, guarded, fair, good, excellent). A summary assessment was also given. The in-patient length of stay and preoperative, 1-, 3-, 6-, 9-, and 12-month BMI changes were assessed in the subset (n = 241) who had undergone surgery.

Results: The CCBRS had excellent internal consistency (Chronbach's alpha = .88) and good consistency across providers (test-retest for overall determination r = .82). Most candidates were deemed acceptable, but 25.7% were initially considered guarded or poor candidates. Only 2.6% of the sample was unable to achieve the goals to improve their candidacy and undergo surgery. Hierarchical regression analyses on the overall CCBRS score demonstrated that unemployment, less education, greater BMI, smoking, and psychiatric medication use were associated with lower assessment scores. Guarded candidates spent significantly longer in the hospital and fair candidates had less preoperative BMI change than guarded or good candidates, although no significant postoperative BMI changes were demonstrated.

Conclusion: The results of our study have shown that the CCBRS is an internally consistent and useful tool for multidimensional psychological assessment of preoperative bariatric candidates. (Surg Obes Relat Dis 2010;6:185–190.) © 2010 American Society for Metabolic and Bariatric Surgery. All rights reserved.

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A preoperative psychological evaluation is a part of the standard guidelines for obesity surgery identified by leading professional groups [1–3], and many insurers have required psychological clearance before approving surgery [4]. Despite the frequency of such evaluations, no consensus has been reached regarding what constitutes an appropriate evaluation, the utility of objective psychological testing, or

the reasons for denial [2,3]. This is not surprising, given the paucity of empirically validated contraindications for surgery and the limited support for behavioral factors that predict for weight loss outcomes [5,6]. However, general agreement has been reached on the important factors to assess [3,7,8]. Generally, researchers have agreed that a standard psychological interview is necessary but is not sufficient for evaluating candidacy [2,5,8–10]. Rather, a detailed assessment of eating behaviors, stress and coping, and social support are considered essential points of an evaluation [3,11,12]. Furthermore, the capacity to consent, an understanding of the risks and benefits of surgery, knowl-

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edge of the surgical procedure, and expectations for weight loss, health outcomes, and psychosocial impact are largely accepted as being of additional importance [5,10–13].

A consensus does seem to have been reached regarding psychosocial contraindications for weight loss surgery, including current illicit drug abuse, active or undercontrolled schizophrenia or other overt psychiatric illness, severe mental retardation, heavy alcohol use, severe and untreated eating disorders, a lack of knowledge about the surgery, severe situational stress, insufficient motivation, and a lack of significant support [1,2,13–15]. In studies examining the rates for psychological denial of weight loss surgery, the refusals for psychosocial reasons tend to range from 2% to 6% [2,13–17]. In addition to such denials, patients might be required to complete additional treatment or delay surgery to stabilize a condition. Studies have suggested that programs do not immediately approve patients because of psychosocial reasons 16% [16] to 25% [3,13] of the time. A survey of 103 psychologists who conduct preoperative psychological evaluations indicated significant variability in such decision-making [15]. Although the respondents noted delaying or denying surgery for an average of 14.3% of candidates, the range was 0–60% [15]. Furthermore, the benefits of recommending delays and the potential loss of patients undergoing surgery because of such delays are largely unknown [3].

Often the psychological evaluation results in final determinations that are either dichotomous (yes/no) or categorical (yes/delayed/no). However, such ratings have less reliability, sensitivity, and validity than more multidimensional assessments [18]. Furthermore, because multidimensional methods are also more likely to improve team communication, increase the specificity of recommendations, and increase research utility, our team developed the Cleveland Clinic Behavioral Rating System (CCBRS). The CCBRS was developed to assess patients' multidimensionally across the variety of domains identified in published reports as important in the preoperative psychological assessment.

The purpose of the present study was to describe the CCBRS; evaluate its psychometric properties; determine the factors related to the overall determinations; and evaluate its predictive utility related to the surgical outcomes.

Methods

Participants

Data were collected from 389 (77.1% female; 74.3% white; and 22.6% black) consecutive bariatric surgery candidates. Almost one half of the patients (mean age ± SD 46.57 ± 11.95 years) were married (48.8%), with some college education (40%). A slight majority of patients were currently employed (56.7%). The patients' initial mean weight was 139.16 ± 35.19 kg (range 82.18–288.55), with a mean BMI of 49.84 ± 11.51 kg/m^2 (range 31.52–99.25).

Follow-up data were collected for the subsample of patients who had undergone weight loss surgery at the analysis and had ≥1 follow-up data point (n = 241). Most of these patients (n = 156; 64.7%) had undergone laparoscopic Roux-en-Y gastric bypass, 38 patients (15.8%) had undergone laparoscopic adjustable gastric banding, 30 patients (12.4%) had undergone laparoscopic sleeve gastrectomy, and 17 patients (7%) had undergone a revision procedure. Among those not undergoing surgery (n = 127), 53 had withdrawn from the program, as determined by multiple "no-shows," 32 had insurance denials or changes, 16 had outstanding patient requirements (eg, cardiology consultation, psychiatry records), 10 had been cleared and approved by their insurance but had declined to schedule the surgery, 10 had converted to medical weight management, 4 had moved, and 2 had died. The Cleveland Clinic institutional review board approved the study.

Assessments

At the initial entry into the program, semistructured psychiatric interviews and objective psychological testing (Millon Behavioral Medicine Diagnostic [19] or Minnesota Multiphasic Personality Inventory-2 Restructured Form [20]) were used to assess the psychiatric co-morbidities in patients seeking weight loss surgery. During the semistructured interview, the lifetime and current psychiatric diagnoses, past and current psychiatric medications, and history of suicide attempts and psychiatric hospitalizations were queried. Additionally, if patients were currently receiving mental health treatment or had had an in-patient psychiatric hospitalization within the previous 5 years, those records were obtained. These served as confirmation of the psychiatric diagnoses for patients who were receiving current psychiatric treatment. Furthermore, at program entry, the patients completed self-report questionnaires answering "yes" or "no" for current or past psychiatric diagnoses of depression, bipolar disorder, anxiety, schizophrenia, anorexia nervosa, bulimia nervosa, binge eating disorder, or other psychiatric conditions. Patients indicated the year they were diagnosed, the types of treatment received, and whether they had been hospitalized for the psychiatric condition. A medical chart review and patient self-report noted current psychotropic medications, which were confirmed at each subsequent visit by the bariatric nurses.

During this initial interview, a number of domains of interest were also queried. The patients underwent a structured clinical interview for binge eating disorder according to the "Diagnostic and Statistical Manual, 4th edition, Text Revision" criteria and were screened for current and past compensatory behaviors and past eating disorder diagnoses. Current and past use, abuse, and dependence of tobacco, alcohol, and illicit substances were queried and, when positive, were confirmed by toxicology screening. The patients' ability to consent and their understanding of the procedure,

risks, benefits, and expectations were queried. Furthermore, their social support, current stressors, coping mechanisms, and efficacy of coping were assessed. Finally, adherence to weight-specific and other lifestyle change behaviors were questioned.

Clinical indices and demographics

During their preoperative evaluation, the patients' height, weight, BMI, education level, marital status, ethnicity, and age were recorded. The length of stay was determined from the electronic medical record. The weight, BMI, weight loss, and BMI change were measured at each subsequent follow-up visit at 1, 3, 6, 9, and 12 months.

Measures

The CCBRS was completed by the evaluating psychologist immediately after the interview and a review of objective test results. Each of the 9 domains was assessed on a Likert rating scale from 5 (excellent) to 1 (poor). The 5 ratings were operationalized as follows: 5, excellent—no concerns and no follow-up with psychology recommended unless future problems develop; 4, good—if a problem is present, it is well managed, with relative weaknesses or concerns addressable without significant intervention; 3, fair—

concerns or risk factors are present but reasonably well-controlled or managed, with a balance between the patient's relative strengths and weaknesses; 2, guarded—strongly recommend intervention before proceeding and likely requires discussion in multidisciplinary rounds; and 1, poor—inappropriate risk that very likely outweighs benefits (eg, threatening or assaulting to staff; acutely psychotic). These ratings were given for the following domains of interest: consent; expectations; social support; mental health; substance use/abuse/dependence; eating behaviors; adherence; coping/stressors; and overall. Table 1 lists the CCBRS and the mean, standard deviation, median, and mode for each domain.

To improve inter-rater reliability, we met weekly during the first 2 months of using the CCBRS to discuss how the determinations were made. No significant differences in the CCBRS scores were found between raters (all $P > .10$).

Statistical analysis

The frequencies and descriptives were initially run on the CCBRS items. The correlation coefficients and internal consistency (Cronbach's alpha) of CCBRS were determined. A subset of 30 patients was randomly selected, and a chart review was performed by a nontreating psychologist. The CCBRS

Table 1
Cleveland Clinic Behavioral Rating System for weight loss surgery

Domain	Poor	Guarded	Fair	Good	Excellent	Mean ± SD	Median (Mode)
Consent (includes capacity to consent, possible cognitive impairment, understanding of risks, benefits, alternative treatment)	1	2	3	4	5	3.77 ± .84	4.00 (4.00)
Expectations (includes realistic nature of surgery, recovery, early transition, weight loss goals, effect on relationships, quality of life, long-term outcome, etc.)	1	2	3	4	5	3.41 ± .85	4.00 (4.00)
Social Support (includes spouse or significant other, children, family members, friends, employer, co-workers; also includes past conversations with bariatric patients, attendance at support groups, etc.)	1	2	3	4	5	3.61 ± .74	4.00 (4.00)
Mental Health (includes psychiatric diagnosis and severity and duration of diagnosis; determination should be based on effect of illness on cognitive capacity, present stability/instability of illness, current treatment, adherence to treatment recommendations, psychosocial stresses that could affect illness and patient insight)	1	2	3	4	5	3.37 ± .91	3.00 (4.00)
Chemical/Alcohol Abuse/Dependence (includes use, abuse, and dependence on alcohol, prescription drugs, and illicit drugs; include history and present use in determination; if history positive, consider period of sobriety and relapse risk; weigh tobacco use/likelihood of quitting in assessment)	1	2	3	4	5	3.88 ± .96	4.00 (4.00)
Eating Behaviors (includes binge eating behaviors, night eating behaviors, compensatory behaviors, history of eating disordered behaviors, and problematic outcomes from past dieting attempts; consider behaviors [eg, "grazing," high-calorie beverage consumption] that might affect outcome)	1	2	3	4	5	2.84 ± .79	3.00 (3.00)
Adherence (includes adherence during previous dieting attempts, adherence with past psychological/psychiatric interventions, adherence with medical recommendations, and likely adherence with tobacco prohibition and program protocol)	1	2	3	4	5	3.37 ± .77	3.00 (3.00)
Coping/Stressors (includes an assessment of coping resources in the context of situational stressors)	1	2	3	4	5	3.19 ± .81	3.00 (3.00)
Overall Impression	1	2	3	4	5	3.13 ± .89	3.00 (3.00)

was completed after the chart review to preliminarily assess the inter-rater reliability between 2 different providers.

After removing the candidates with a poor rating, a chi-square analysis was conducted to compare those who did and did not undergo surgery on the overall CCBRS rating. To determine the relative contribution between the psychosocial variables and overall determinations of candidacy, a hierarchical regression analysis was conducted. The criterion variable was the overall CCBRS rating with the demographic variables (age, gender, employment status, and education) entered as a predictor in the first step. In the second step, the initial BMI was included. Next, the presence, history, or absence of alcohol abuse/dependence, substance abuse/dependence, and tobacco use/dependence were entered into the regression equation. Finally, the psychiatric variables were included (current or past history of outpatient mental health treatment, history of in-patient psychiatric treatment, and current or history of psychotropic medication use).

In the subset who had undergone surgery, a series of univariate analysis of covariance were conducted on the initial CCBRS overall assessment for the preoperative BMI change (a loss of 10% of excess body weight before surgery was recommended for all patients), length of hospital stay, 1-, 3-, 6-, 9-, and 12-month BMI change, covarying type of surgery. Finally, differences in the ratings on the CCBRS according to the surgery type (Roux-en-Y gastric bypass, laparoscopic adjustable gastric banding, laparoscopic sleeve gastrectomy) were examined using analysis of variance.

Results

Most candidates (71.7%) were deemed psychologically acceptable (fair, good, or excellent). A significant subset (25.7%) was considered guarded, and additional treatment and/or requirements were necessary before psychological clearance. Only 2.6% of candidates were deemed poor and were unable to achieve the goals that would lead to clearance for surgery.

The CCBRS demonstrated excellent internal consistency (Cronbach's alpha = .88). Although each domain correlated significantly with the others (all $P <.05$), the correlation coefficients ranged from .28 (eating behaviors and substance use/abuse/dependence) to .57 (consent and expectations). Although indicative of significant overlap, less than one third of the variance (32%) was shared by the highest correlating domains. The overall inter-rater reliability was quite good ($r = .82$) between 2 different providers. The individual item inter-rater reliability ranged from .89 (consent) to .53 (adherence).

Participants with a guarded rating were more likely to not undergo surgery than those with a fair, good, or excellent rating [chi-square (1,49) = 44.10; $P <.001$]. Participants with a guarded rating were more likely to withdraw from the program, as evidenced by multiple "no shows," and more likely to have outstanding patient requirements.

In the hierarchical regression analysis examining the predictors of the overall CCBRS score, the demographic variables accounted for 13% of the variance [$F (4, 369) = 14.22$; $P <.001$]. The BMI in the second step was also significant and accounted for an additional 2% [$F (5, 368) = 8.59$; $P <.01$]. The inclusion of alcohol, tobacco, and illicit substance variables added an additional 9% [$F (9, 364) = 11.39$; $P <.001$]. Finally, the inclusion of psychiatric variables added an additional 5% to the explained variance in the overall CCBRS score [$F (14, 359) = 5.54$; $P <.001$]. The overall model explained 30% of the variance in the overall score ($r = .55$). In examining the individual significant predictors in the final model, education ($t = 2.07$; $P <.04$), employment status ($t = 4.21$; $P <.001$), BMI ($t = -2.91$; $P <.01$), smoking ($t = -3.76$; $P <.001$), and current psychotropic medications ($t = -3.12$; $P <.01$) were significant. Less educated, unemployed, higher BMI, current or past smoking, and current psychotropic medication use were given lower overall ratings on the CCBRS.

Analyses of covariance were conducted on the overall ratings (no poor candidates underwent surgery), co-varying the surgery type for the preoperative BMI change, postoperative in-patient length of stay, and BMI change at 1, 3, 6, 9, and 12 months (sample size, mean, standard deviation, F, and P values listed in Table 2). A significant effect of the CCBRS overall score was demonstrated for preoperative BMI change [$F (4, 238) = 3.03$; $P = .03$]. Post hoc tests indicated that candidates with a fair rating lost significantly less weight than did those with a guarded or good rating. A significant effect was also found for postoperative length of in-patient stay [$F (4, 237) = 5.48$; $P <.001$]. Post hoc analyses indicated that patients identified as guarded on the CCBRS spent significantly longer in the hospital than did patients rated as fair, good, or excellent. However, no significant differences were found for BMI change at each follow-up point according to the overall CCBRS score.

Finally, no significant differences were found for surgery type on any of the 8 domains or the overall CCBRS score (all $P >.10$).

Discussion

The presented results suggest that the CCBRS is a brief, internally consistent instrument for assessing surgical candidates across a variety of psychosocial domains. Very similar to other reports, most candidates were considered acceptable for surgery, with a significant minority requiring additional treatment and/or stabilization and a very small percentage (2.6%) unable to achieve candidacy [2,13–17]. We also had a very small percentage (3.1%) of excellent candidates. This might indicate providers' preferences for less extreme recommendations or might be indicative of the frequency of at least minimal psychosocial concerns in a bariatric population. Our proportion of guarded patients—analogous to waiting/requiring more treatment—was greater than that

Table 2
Mean, standard deviation, F and P values for comparisons among overall CCBRS score

Variable	Guarded (n = 41)	Fair (n = 87)	Good (n = 103)	Excellent (n = 8)	F	P value
Preoperative BMI (kg/m^2) change	2.58* ± 3.64	.93*† ± 3.08	1.90† ± 2.96	2.17 ± 3.04	3.03	.03
Length of stay (days)‡	5.08*†§ ± 4.68	2.67* ± 1.41	2.63† ± 1.40	2.38§ ± .74	5.48	.001
BMI (kg/m^2) change						
1 mo	6.58 ± 4.16	5.53 ± 3.30	6.17 ± 2.96	7.09 ± 3.91	1.12	.34
3 mo	8.23 ± 4.85	8.45 ± 4.75	9.04 ± 3.66	9.00 ± 1.68	.27	.85
6 mo	11.48 ± 6.26	10.70 ± 5.98	11.54 ± 4.62	—	.28	.76
9 mo	11.17 ± 8.14	13.80 ± 5.61	13.29 ± 5.39	—	.79	.46
12 mo	12.42 ± 7.99	12.70 ± 4.91	15.11 ± 5.61	—	.94	.40

CCBRS = Cleveland Clinic Behavioral Rating System; BMI = body mass index.

Data presented as mean ± standard deviation.

* Significantly different from each other.

† Significantly different from each other.

‡ Removal of 1 participant with guarded rating with length of stay of 50 days.

§ Significantly different from each other.

reported by other programs [13,15,16]. This might relate to the more tertiary nature of our program or our availability of brief on-site treatment for common co-morbidities such binge eating disorder [21]. This can lead to short delays to optimize candidacy. However, these patients were more likely to leave the program or to be significantly delayed by outstanding patient requirements. This suggests that closer follow-up and guidance might be needed to help psychologically higher risk persons complete surgery.

The CCBRS had very good internal consistency within our sample. Although the CCBRS items correlated significantly, the shared variance between items was <50%, considered acceptable because the items measure similar but different aspects of a construct of interest [22]. Preliminary work on inter-rater reliability was also quite favorable, with 2 different psychologists' overall rating correlating at .82. Future research should further examine the inter-rater reliability of the rating scale in real time and could compare the results with other patient-, family-, or physician-based rating scales. Work should also examine the feasibility and utility in clinical practice. However, our experience has shown that its use improved the communication with the multidisciplinary team. Instead of reviewing the lengthy report provided, surgeons and other clinicians can quickly review the measure for a summary of a patient's strengths and weaknesses while still preserving much of the important nuanced information obtained during the evaluation.

The variables most strongly associated with lower summary scores were unemployment, less education, higher BMI, current tobacco use, and current psychiatric medication use. This was largely consistent with the published data demonstrating poorer outcomes for older patients [23,24] and those with a higher BMI [23,24], and knowledge of these data might have influenced ratings. Less well-examined in the published data is the influence of employment, education, or tobacco use; although our findings suggest these variables as potential areas for future studies. Our population had a greater rate of unemployment than that of

many other sites, likely because of our acceptance of Medicare and Medicaid. Thus, these results might not be generalizable to other bariatric populations. Furthermore, unemployment, which was initially entered into the equation, might be reflective of other important factors that might influence the ratings (eg, patients receiving disability for mental illness). The current use of psychiatric medications was markedly common (46.8%) and analogous to that reported by other studies (39.9–47.7%) [16,25,26] but also related to poorer scores on the CCBRS. However, the more frequently examined co-morbid psychiatric diagnoses were not examined [27]. The patients who were seen as more functional (ie, working, better educated) were seen as better candidates, although these factors did not make a difference in their first year of weight loss. Future work should examine the predictive utility of the measure for psychosocial variables related to postoperative adjustment and weight loss maintenance in the years after bariatric surgery.

The overall assessments on the CCBRS were predictive of preoperative adherence to weight loss recommendations and in-patient length of stay. Somewhat surprisingly, the candidates with a fair rating lost less weight than those who with a guarded or good rating. However, the candidates with a guarded rating were delayed to achieve psychiatric and behavioral goals and thus had a longer period to achieve the preoperative BMI change than those who were immediately cleared. Furthermore, many of the interventions they were receiving (eg, treatment of binge eating disorder) might have not only affected their preoperative functioning but also their postoperative outcomes.

The longer length of stay for the candidates with a guarded rating has important clinical implications. Future work should examine the factors that prolong the hospital stay among these candidates. Knowledge of this overall rating could be used as a guide in managing in-patient and postoperative care. Our results were consistent with the larger psychosocial bariatric data that has yet to consistently identify the psychological variables that reliably predict

weight loss outcomes [6,7]. Longer term weight loss outcome and psychosocial outcome variables might be more likely to correlate with the initial CCBRS ratings. However, it is also important to note that the domains of concern are almost always points of intervention before surgery. Thus, whether the lack of predictive utility resulted from effective treatment or insignificance of the psychosocial variables for postoperative weight loss is unknown.

Our multidimensional assessment relied heavily on patients' capacity to verbally communicate and assumes a high degree of veracity. Although we supplemented the interview with objective psychological testing, the tendency to present one's self in a more favorable light could reduce the validity of the CCBRS. Future work should examine the convergent validity of this measure with objective testing, outside medical records, and other collateral information.

Conclusion

The CCBRS is a reliable, multidimensional measure for assessing surgical candidates across 8 psychosocial domains of interest.

Disclosures

The authors have no commercial associations that might be a conflict of interest in relation to this article.

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