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Original article

Using presurgical psychological testing to predict 1-year appointment adherence and weight loss in bariatric surgery patients: predictive validity and methodological considerations

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Abstract

Background: Previous studies suggest that presurgical psychopathology accounts for some of the variance in suboptimal weight loss outcomes among Roux-en-Y gastric bypass (RYGB) patients, but research has been equivocal.
Objectives: The present study seeks to extend the past literature by examining associations between presurgical scale scores on the broadband Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF) and suboptimal weight loss and poor adherence to follow-up 1 year postoperatively after accounting for several methodologic considerations.
Setting: Cleveland Clinic Bariatric and Metabolic Institute, Cleveland, Ohio, USA.
Methods: The sample consisted of 498 RYGB patients, who produced a valid presurgical MMPI-2-RF protocol at program intake. The sample was primarily female (72.9%), Caucasian (64.9%), and middle-aged (mean = 46.4 years old; standard deviation [SD] = 11.6). The mean presurgical body mass index (BMI) was 47.4 kg/m^2 (SD = 8.2) and mean percent weight loss (%WL) at 1 year postoperatively was 31.18 %WL (SD = 8.44).
Results: As expected, scales from the Behavioral/Externalizing Dysfunction (BXD) domain of the MMPI-2-RF were associated with worse weight loss outcomes and poor adherence to follow-up, particularly after accounting for range restriction due to underreporting. Individuals producing elevated scores on these scales were at greater risk for achieving suboptimal weight loss (<50% excess weight loss) and not following up with their appointment compared with those who scored below cut-offs.
Conclusions: Patients who are more likely to engage in undercontrolled behavior (e.g., poor impulse control), as indicated by presurgical MMPI-2-RF findings, are at greater risk for suboptimal weight loss and poor adherence to follow-up following RYGB. Objective psychological assessments should also be conducted postoperatively to ensure that intervention is administered in a timely manner. Future research in the area of presurgical psychological screening should consider the impact of underreporting and other discussed methodologic issues in predictive analyses. (Surg Obes Relat Dis 2015;▮:00–00.) © 2015 American Society for Metabolic and Bariatric Surgery. All rights reserved.

Keywords: Obesity; MMPI-2-RF; Bariatric surgery; Assessment; Weight loss; Adherence; Outcome; Psychology; Underreporting; Roux-en-Y; Incremental validity

Bariatric surgery for obesity is associated with better weight loss outcomes compared with diet, lifestyle changes, or pharmacotherapy alone [1]. However, prevalence for psychiatric disorders is higher among bariatric surgery

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candidates than among the normative population [2–4], and psychopathology persists following surgery [5–13]. Measures associated with externalizing psychopathology (a construct that encompasses under-controlled behaviors, such as impulsivity, substance use, aggression, etc. [6]) account for the variance in postoperative outcomes. For example, studies using neuropsychological assessment instruments suggest that poor executive functioning (associated with impulsivity, poor planning, etc.) is positively associated with suboptimal weight loss and nonadherence to postoperative guidelines [7,8]. Poor executive functioning is associated with an increased risk of externalizing psychopathology owing to deficits in disinhibition. Of note in this context, although patients may underreport externalization of problems, assessments of their executive functioning would not be impacted by an underreporting response style (i.e., they generally would be motivated to put forth good cognitive effort). Thus, associations between poor executive functioning and substandard weight loss outcomes may reflect, at least to some extent, the influence of a third variable—externalizing psychopathology. Studies utilizing postoperative assessments of eating behaviors suggest that up to 38% of patients report maladaptive eating behaviors, namely, grazing (picking and nibbling at food over an extended period of time) [9,10]. The prevalence rate for alcohol abuse 2 years postoperatively is 9.6% and is statistically higher than the presurgical prevalence rate, although it is unrelated to weight loss [11]. In terms of factors related to internalizing psychopathology (mood- and anxiety-related problems), some reports suggest that a presurgical presence of a mood or anxiety disorder impedes weight loss outcomes [12–14], whereas others suggest no association [13,15] or enhanced outcomes [16] between measures of mood or anxiety and weight loss outcomes.

Because of these high rates of psychosocial comorbidities and their potential impact on treatment, the American Society for Metabolic and Bariatric Surgery (ASMBS) [17] recommends multidisciplinary assessment of the bariatric surgery candidates that includes presurgical psychological screening [18]. One goal of presurgical psychological assessments is to identify constructs that may impede surgical outcomes. However, research on the associations between psychopathology and postoperative weight loss outcomes has been largely equivocal [19].

Livhits et al. [19] conducted a meta-analysis of 115 articles examining presurgical psychological screening of bariatric surgery candidates published between 1998 and 2010. They found minimal to no evidence for associations between postoperative weight loss and the following presurgical variables: previous weight loss attempts, binge/sweet/maladaptive eating habits, depression, anxiety, history of sexual abuse, self-esteem, past/current alcohol abuse/use, and other psychiatric disorders. The presence of a personality disorder was the only preoperative psychosocial factor that was unequivocally associated with suboptimal weight loss outcomes in their review. However, deriving consistent inferences in this area is difficult because bariatric surgery is an invasive procedure that typically requires substantial multidisciplinary follow-up, including psychological interventions when psychopathology is identified [17]. Furthermore, studies tend to be limited by significant attrition at follow-up assessments. In addition, from an ethical perspective, it is unrealistic to experimentally control for confounding treatment factors, which likely attenuate associations between psychopathology identified presurgically and postoperative treatment outcomes.

The Minnesota Multiphasic Personality Inventory-2-Restructured Form (MMPI-2-RF) [20,21] is a broadband psychological test, with research supporting its utility in bariatric surgery candidates [3,22–24]. The MMPI-2-RF was developed to improve upon the psychometric properties (e.g., reliability and validity) of the MMPI-2 [25], improve the accuracy of the validity scales (e.g., scales detecting random or fixed responding, overreporting symptoms, and underreporting symptoms), provide a straightforward interpretative strategy for clinicians, and lessen the burden for patients (administration time for a paper-pencil administration is approximately 35 to 50 minutes).

With regard to psychometric improvements, a general factor termed *demoralization* was theorized to be reducing the discriminant validity of the original Clinical Scales of the inventory. It reflects nonspecific distress, unhappiness, and dissatisfaction with current life circumstances [26–30]. Demoralization has also gained attention across behavioral medicine settings [30,31]. Demoralization variance overly saturated the original Clinical Scales [32]. Items associated with demoralization were removed from the original Clinical Scales of the MMPI-2 (now measured as demoralization [RCd] on the MMPI-2-RF), leading to the development of the more homogeneous Restructured Clinical (RC) Scales [32]. A similar process using the MMPI-2 item pool led the development of the 338-item MMPI-2-RF.

The nine validity scales of the MMPI-2-RF aid the clinician in assessing the credibility of an individual's test scores. Specifically, the validity scales consist of two scales that assess for inconsistent responding. The five overreporting scales assess the extent to which the patient is exaggerating psychological, somatic, or cognitive symptoms. Of most relevance for assessing bariatric surgery candidates, the two underreporting scales assess whether the patient is trying to present as more well-adjusted average.

The substantive scales of the MMPI-2-RF assess psychopathology in a hierarchical manner similar to emerging models of psychopathology [33–36] and personality disorders [37,38]. The test assesses emotional, thought, and behavioral dysfunction as well as various somatic or cognitive complaints and interpersonal functioning. Specifically, the test measures these constructs in a hierarchical manner. For example, Restructured Clinical Scale 7

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