

Preoperative Psychological Testing—Another Form of Prejudice

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Abstract Preoperative psychological screening of bariatric surgery candidates has become routine, and a significant proportion of patients have their surgery deferred as a consequence. If psychological testing is being used as a form of preoperative triage, both patients and surgeons are entitled to know whether there is sufficient evidence to justify its use in this way. We define the argument for psychological screening as consisting of four premises (p1–p4) and a conclusion (C) as follows: (p1) A significant minority of obese patients will not be successful in losing weight following bariatric surgery—the “failure” group; (p2) A significant minority of patients will exhibit abnormal psychological profiles during preoperative testing; (p3) The majority of individuals referred to in (p2) will be found in group (p1) i.e., abnormal psychological profiles identified preoperatively *predict* less favorable weight loss outcomes postoperatively; (p4) Identifying patients with adverse psychological profiles preoperatively would allow either exclusion of those at high risk of failure or provide a more secure rationale for targeted pre- and postoperative support; (C) Psychological screening should be part of the routine

preoperative assessment for patients undergoing obesity surgery. We reviewed the literature to find evidence to support the premises and show that (p1) can be justified but that (p2) is problematic and can only be accepted in a heavily qualified version. We find no evidence for (p3) and since (p4) and (C) are predicated on (p3), the argument clearly fails. There is no evidence to suggest that preoperative psychological screening can predict postoperative outcomes and no justification for using such testing as a means of discriminating between candidates presenting themselves for bariatric surgery.

Keywords Predictors of success · Psychological screening · Bariatric surgery · Psychopathology · Psychological profile · Psychosocial factors

Introduction

Bariatric surgery is currently the only effective long-term treatment for morbid obesity and its related comorbidities [1–3]. Depending upon the procedure, patients typically lose between 40% and 70% of excess weight with a mean loss of approximately 60% 2 years postoperatively [4]. Postoperative weight loss is associated with major improvements in obesity-related comorbidities, including diabetes, hypertension, dyslipidemia, sleep apnea, and overall quality of life [4–9]. Moreover, these beneficial metabolic and other effects translate into significant reductions in mortality, morbidity, and health care use in surgically treated patients compared with nonsurgically treated controls [10–13].

In spite of these important health benefits, it is well recognized that long-term successful weight loss following

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surgery is by no means guaranteed. A sizeable minority, perhaps as many as 20%, fail to lose a significant amount of weight for reasons unconnected with the surgery itself, or regain weight within 2 years of surgery [14–16].

Unsurprisingly, practitioners have long desired to identify baseline predictors of poor weight loss and related outcomes following obesity surgery. The stated aim of preoperative testing is to identify those candidates for whom the probability of success is limited and (more importantly) those whose chances of success can be enhanced significantly through targeted intervention in the form of pre- and postoperative counseling, education, support, and in some cases formal psychiatric treatment. In this way, it is claimed, long-term outcomes can be improved and a higher proportion of applicants can be offered surgery [17].

Numerous studies have reported a high prevalence of psychopathology among patients seeking surgery for morbid obesity. Accordingly, patients who seek bariatric surgery typically are required by their medical insurers to complete a behavioral (i.e., psychiatric) examination with a mental health provider to determine their suitability for surgery [18]. This practice followed a consensus development conference in 1991 sponsored by the US National Institutes of Health, which recommends monitoring and addressing psychological and behavioral factors both pre- and postsurgery [19]. The American Society of Metabolic and Bariatric Surgery (ASMBS) offers specific guidelines for the preoperative psychological assessment of bariatric patients, and some form of preoperative test has become a standard requirement for most US insurance companies reimbursing for bariatric surgery [20]. Given this background, it is not surprising that preoperative psychological evaluation of bariatric surgery candidates has become the norm both in the US and in some other countries where bariatric interventions are available [21–23].

An important consequence of routine preoperative psychological testing is that a significant proportion of patients—up to one quarter—have their surgery deferred, with perhaps as few as 10% of those deferred returning for surgery within 27 months [21, 24, 25]. If psychological testing is being used as a form of preoperative triage, which results in some patients being denied potentially life-saving surgery, both patients and healthcare professionals are entitled to ask whether there is sufficient evidence to justify its use in this way. This paper will review the argument and the evidence for preoperative psychological evaluation in patients seeking bariatric interventions.

Method

The claim that psychological screening should be included as part of the routine preoperative assessment in patients

undergoing weight loss surgery is actually the conclusion of an argument with clearly identifiable—although usually hidden—premises. If we define a poor treatment response as inadequate postoperative weight loss, the argument in favor of preoperative psychological testing can be set out as four premises (p1–p4) and a conclusion (C) as follows:

- (p1) A significant minority of patients will not be successful in losing weight following obesity surgery—the “failure group”
- (p2) A significant minority of obese patients will exhibit abnormal psychological profiles (as defined by specific responses on standard psychological instruments) during preoperative testing.
- (p3) The majority of individuals referred to in (p2) will be found in the group referred to in (p1) i.e., abnormal psychological profiles identified preoperatively *predict* less favorable weight loss outcomes postoperatively.
- (p4) Identifying patients with adverse psychological profiles preoperatively would allow either exclusion of those at high risk of failure or provide a more secure rationale for targeted pre- and postoperative support.
- (C) Psychological screening should be included as part of the routine preoperative assessment in patients undergoing weight loss surgery.

Our willingness to accept the conclusion (C) should be based on the evidence we are able to adduce in support of *each one* of the premises (p1–p4). We reviewed the literature for evidence in relation to each of the four premises in turn.

Premise 1 A significant minority of patients will not be successful in losing weight following obesity surgery—the “failure” group

The first premise (p1) looks uncontroversial. All healthcare professionals involved in the surgical management of obesity will be acutely aware that a proportion of patients will fail to lose a significant amount of weight following bariatric intervention [14–16]. Precisely what *significant* weight loss means in this context is, however, a matter of some controversy and confusion [26–28].

Fortunately, for our purposes, a precise definition of weight loss “failure” is not required. The advocate of presurgical psychological assessment has to show only that a specific psychological profile identified preoperatively can predict failure (in this case poor weight loss) postoperatively; almost any definition of failure will do.

Premise 2 A significant minority of obese patients will exhibit abnormal psychological profiles (as defined by specific responses on standard psychological instruments) during preoperative testing.

At first sight, the second premise (p2) also seems uncontroversial since there is a wealth of evidence to suggest that morbidly obese subjects who are candidates for bariatric surgery have a high prevalence of psychopathology. However, a closer scrutiny of the evidence would suggest that things are not quite as straightforward as they first appear. Because this is a substantial literature, only the briefest of summaries will be attempted here.

Sarwer et al. [29], found that almost two-thirds of bariatric surgery candidates received a presurgery psychiatric diagnosis, the most common of which was major depressive disorder. Nearly 40% of patients were engaged in some form of psychiatric treatment at the time of the evaluation. These findings are consistent with an earlier report, which found that 58% of candidates for gastric bypass surgery had identifiable psychopathology and 20% were rejected from the treatment program following initial assessment [30].

Hsu et al. [16] reported lifetime prevalence rates of major depression among morbidly obese patients of 29–51% and Onyike et al. [31] found that patients with morbid obesity were five times more likely to have experienced an episode of major depression in the past year than were individuals of average weight.

Anxiety disorders including generalized anxiety disorder and social phobia have been diagnosed in up to 48% of candidates for bariatric surgery and up to 72% have been diagnosed with personality disorders [32].

Several investigators have defined preoperative psychopathology according to the Diagnostic and Statistical Manual of Mental Disorders (DSM) [33, 34]. The DSM organizes each psychiatric diagnosis into five levels (axes) relating to different aspects of disorder or disability. Axis 1 includes major mental illnesses, while Axis 2 includes underlying personality disorders. Using these two diagnostic categories, the prevalence of Axis 1 disorders in preoperative testing of obese patients has been found to vary between 20% and 70%, and that for Axis 2 between 22% and 29% [32, 35–43].

Between 10% and 50% of bariatric surgery patients screened preoperatively are thought to suffer from binge eating disorder (BED) [35, 44–47], although more recent studies have typically found rates between 10% and 27% [48–50]. In addition, sizeable minorities of bariatric patients have been diagnosed with substance abuse disorders [49–52].

Taken together, the results from these and other studies suggest an alarmingly high rate of psychopathology among bariatric surgery candidates, including depression, anxiety, personality and eating disorders, and substance abuse. However, these findings have to be interpreted with caution, given the important methodological differences that exist across these various studies. For example, a number of investigators used unspecified clinical interviews to assess

the prevalence of psychological/psychiatric illness; some used DSM criteria to classify patients, while others did not specify the diagnostic criteria; some studies focused on current psychiatric diagnoses, whereas others based results on both current and lifetime occurrences of disorders combined. Importantly, few studies included an appropriate control or comparison group, which makes it difficult to know whether these findings are specific to bariatric patients or whether similar rates of psychopathology would be found in other presurgical groups or in nonobese patients [32].

In addition to these methodological differences, there is both a lack of consensus concerning which instruments should be used for preoperative screening and considerable controversy regarding their validity. Even the authors of the DSM acknowledge that its diagnostic and criterion sets are highly questionable [53–55]. For example, there is disagreement regarding the degree to which an Axis II diagnosis is a valid indicator of mental disorder [56–58]. No criterion has been identified that can be used to distinguish between those who can be reliably diagnosed as personality disordered and those who cannot [59]. This ambiguity makes it very difficult to know what it means to say that 72% of obese patients presenting for bariatric surgery have a “personality disorder”.

It is important to recall that (p2) makes reference to a “significant minority of obese patients, etc”. This is relevant, because many of the studies referred to above report a *majority* of bariatric patients with psychiatric comorbidities. However, if a particular characteristic is identified in a majority of patients preoperatively, then the characteristic has no discriminatory value whatever and cannot be used as a predictor of poor weight loss outcomes in a minority of patients postoperatively.

In summary, we can agree that patients presenting themselves for bariatric surgery appear to have a high prevalence of psychiatric/psychological disorders as defined by specific patterns of responses on standard instruments. However, precisely what these findings mean and their relevance to patient care are unknown.

Premise 3 The majority of individuals referred to in (p2) will be found in the group referred to in (p1) i.e., abnormal psychological profiles identified preoperatively predict less favorable weight loss outcomes postoperatively.

Two decades ago, Powers et al. [60], studied a group of 131 surgical patients who underwent a detailed presurgical psychiatric evaluation and who were then followed for almost 6 years. The authors found no association between the presence or absence of a presurgical psychiatric diagnosis and weight loss. A similar negative association was reported in an early study by Hsu et al. [16].

More recently, Vallis et al. [61] studied 89 morbidly obese patients undergoing vertical banded gastroplasty (VBG). Regardless of presurgery psychological profile, VBG produced significant weight loss maintained 1 year after surgery. There was no evidence to suggest that those with adverse preoperative psychological assessments did worse than those with more favorable profiles. Moreover, presurgical psychological difficulties were normalized following surgery. The authors call into question the practice of attempting to screen out individuals with psychological problems prior to surgical intervention.

Similarly, Black et al. [62] examined associations between lifetime Axis I and Axis II disorders and weight loss in 44 patients undergoing VBG for morbid obesity. The authors concluded that neither Axis I nor Axis II diagnoses were predictive of weight loss following VBG during a 6-month follow-up.

Interestingly, Averbukh et al. [63], showed a *positive* association between presurgical depression scores and postoperative weight loss. In other words, more depressed individuals tended to lose greater amounts of weight compared with less depressed individuals. Similarly, Clark et al. [64] showed that bariatric patients with a history of psychiatric illness or substance abuse, lost more weight postoperatively compared to those without such histories.

In addition to these individual studies, at least four major systematic reviews have provided a detailed and comprehensive examination of the relationship between a variety of preoperative psychological/psychiatric variables and postoperative outcomes [32, 65–67]. All four reached broadly the same conclusion, stated succinctly by Wadden et al: “*Researchers and clinicians are not able to predict which surgery patients will have suboptimal weight loss or suffer from clinically significant behavioral complications, including depression, binge eating, vomiting or dumping*”.

The studies and reviews referred to above are consistent in finding either no association (or a positive association) between adverse psychosocial variables and postoperative outcomes. In contrast to these findings, several studies have reported that certain preoperative psychological variables *can* predict postoperative outcomes. Because of their more favorable conclusions, these studies deserve to be considered in more detail.

Ryden et al. [68] found that preoperative depression was associated with suboptimal weight loss. Unfortunately, the study had a 40% dropout rate and the authors based their conclusion on a comparison made between just 13 patients who achieved satisfactory weight loss and seven who did not. As we have already seen, the burden of evidence derived from more adequately powered studies finds either no such association between preoperative depression scores, or even a positive association [62].

Lanyon and Maxwell [17] studied 131 morbidly obese patients listed for gastric bypass. Prior to surgery, each patient underwent a structured interview using an instrument developed by one of the authors and containing a total of 273 items, together with five established psychological inventories. Postoperative weight loss and changes in BMI were used as the outcome measures.

In their results, the authors list no fewer than 33 individual correlations with postoperative weight loss, all of which were extremely weak and almost none of which reached statistical significance. Having ascertained that none of the individual variables had a significant association with the outcome measures, the authors derived several composite variables, which they found to have a stronger association with weight loss. However, this post hoc statistical maneuver clearly falls well short of showing that a variable (any variable) identified preoperatively, can predict poor weight loss outcomes postoperatively.

In a recent report, Leombruni et al. [69], studied severely obese patients who underwent laparoscopic vertical banded gastroplasty (VBG). All were assessed with a semistructured interview and a battery of psychological tests preoperatively and at 6 months following surgery. The authors speculate that “Self-directedness”, “Self-transcendence” and “Bulimia and Asceticism”, might have a specific influence on short-term outcomes of VBG.

Once again there are serious methodological obstacles for which no amount of statistical manipulation can compensate. The study had a small number of subjects (38) and there was considerable selection bias since, although 52 were originally selected, 10 were excluded because of psychiatric comorbidity. Given that psychiatric comorbidity is said to be typical of patients undergoing bariatric surgery, it is not clear why the authors chose to exclude these subjects. Moreover, although we are told that the aforementioned traits (Self-directedness, etc) might have a specific influence on short-term outcomes of VBG, we are not told what the magnitude of that influence might be. We therefore have no idea as to the difference in weight loss between the group with these characteristics compared with those in whom they were absent.

Finally, binge-eating disorder has also been claimed as a predictor of outcomes following obesity surgery. In a prospective study of 216 subjects, Sallet et al. [70], found an association between preoperatively diagnosed binge-eating disorder (BED) and subclinical binge-eating disorder (SBED) and poorer postoperative weight loss. The authors appear to have applied broad diagnostic criteria to the cohort since 173 (80%) of the subjects were diagnosed with either BED (44/20%) or SBED (129/60%), a prevalence substantially higher than the 10–27% found in recent studies [48–50].

After a 2-year follow-up, among those who exhibited poorer weight loss—defined as <50% of excess BMI lost—a total of 10 were found in the BED/SBED group, which represents 10% of the total (98) with BED/SBED. Put another way, 90% of those with BED/SBED diagnosed preoperatively were found to have satisfactory postoperative weight loss. On this account, the presence of BED/SBED is a predictor of success rather than failure. This illustrates a point made earlier, that where the majority of individuals have a characteristic identified preoperatively, it cannot be used as a predictor of postoperative failure in a minority since, by definition, the majority of those with the characteristic will be successful. Moreover, several other prospective studies have failed to find any association between presurgical binge eating and suboptimal postoperative weight loss [71–74].

To summarize, despite the fact that numerous attempts have been made to find an association between psychological variables identified preoperatively and postoperative outcomes, to date none of these attempts has succeeded. Indeed, what is striking about the majority of studies reviewed in relation to (p3) is their consistency in finding no such association. As we have seen, the few studies, which claim to have identified outcome predictors, have serious methodological flaws, which make their claims unreliable. It follows that since (p3) cannot be justified, the argument for preoperative screening is seriously undermined.

Premise 4 Identifying patients with adverse psychological profiles preoperatively would allow either exclusion of those at high risk of failure or provide a more secure rationale for targeted pre and postoperative support.

This premise (p4) is predicated on (p3), since exclusion of those at high risk of failure clearly presupposes that we can identify them. However, since we have refused to accept (p3) for lack of evidence, we are clearly not in a position to identify a “failure” group who may benefit from targeted intervention as asserted in (p4). If the evidence for (p3) were convincing, then (p4) *might* turn out to be true and we would at least then be in a position to design studies to test it. However, since we cannot get beyond (p3), we have no means of establishing (p4).

Conclusion Psychological screening should be included as part of the routine preoperative assessment in patients undergoing weight loss surgery.

Since there is a conspicuous lack of evidence in support of the key premises of the argument, we see no reason to accept the conclusion (C).

Discussion

A striking feature of the literature regarding the use of preoperative psychological screening in patients undergoing obesity surgery, is the frequency of statements which unambiguously support the practice, without any attempt to justify it. For example:

“We can, however, via the pre-operative behavioural health assessment, identify psychosocial risk factors and make recommendations to both the client and the surgical group that are aimed at facilitating the best possible outcome for the patient” [20]

“The purpose and usefulness of professional psychological evaluation of patients in the process of qualifying them for the surgical treatment of obesity should not raise any doubts” [75]

Statements of this kind are clearly question begging, since they take for granted the very point in question. There is simply no evidence to support such assertions. The fact that they seem to be so widely believed, illustrates the extent to which the need for presurgical psychological assessment has now become an unthinking, unquestioned dogma promoted as a mark of good practice.

Why should this be so? Why should the argument for preoperative psychological screening have gained such influence when there is so little evidence to justify it? We do not, for example, demand that patients undergoing coronary artery surgery, hernia repair, or hip replacement undergo preoperative psychological evaluation, so why do we insist on it for patients with weight problems? Part of the answer must surely lie in longstanding societal attitudes toward obesity, which has been correctly described as the “last socially acceptable form of prejudice” [76]. A remarkably persistent—although often unstated—manifestation of this prejudice is the assumption that obesity is primarily a psychological disorder. Despite the fact that such an outmoded view has been comprehensively discredited, even some professionals continue to espouse it. On this view, since obese patients are perceived as psychologically disturbed, it follows that psychologists are those best equipped to deal with them.

The fact is that obesity does not have a primarily psychological pathogenesis. On the contrary, it is a complex multifactorial disease that develops from the interaction of genetic, metabolic, social, and behavioral factors [77]. Indeed, it is precisely because psychological variables are not primary that helps to explain why they have so little predictive power [78]. Furthermore, the observation that most or all psychopathology disappears with successful weight loss following bariatric surgery strongly suggests that psychological disturbances are the *consequences*, not

causes, of morbid obesity. Thus, psychologists and other proponents of preoperative psychological testing may be pursuing a chimera.

Given that the argument for preoperative psychological testing does not stand up to scrutiny, it is reasonable to ask on what basis its proponents—psychologists, insurance companies, and others—arrogate to themselves the right to recommend who should be allowed to proceed to surgical intervention and who should not? Since many of those who have their surgery deferred will not return, this is a question of some importance. More specifically, if a patient is being denied a potentially life-saving procedure on the basis of psychological tests which have no predictive value and goes on to suffer the effects of a preventable comorbidity (diabetes, myocardial infarction etc), then not only the patient, but presumably their legal representatives, will be entitled to ask some searching questions concerning the rationale behind such a decision.

If a preoperative test with the ability to predict reliably postoperative outcomes could be devised, it would be of enormous benefit to both patients and health professionals alike. However, it is abundantly clear from this review that such a test, even if theoretically possible, is well beyond the immediate horizon. The challenge for advocates of psychological testing who wish to pursue this area of research is first to acknowledge the enormous evidential gap that separates the idea of a valid preoperative test from the reality. They must then deal with the myriad methodological problems which have been such a conspicuous feature of previous studies and which have consistently undermined attempts to reach reliable, evidence-based conclusions. Only when the methodological (including definitional) issues have been addressed, will it be worthwhile proceeding to the large prospective studies required to answer the question of whether preoperative psychological testing in obese patients, adds anything to patient selection and postoperative outcomes. Unless and until this question is answered in the affirmative, the use of psychological testing as a means of preoperative triage should cease.

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References

- McTigue KM, Harris R, Hemphill B, et al. Screening and intervention for obesity in adults: summary of the evidence for the US Preventive Services Task Force. *Ann Intern Med.* 2003;139:933–49.
- O'Brien PE, Dixon JB, Laurie C, et al. Treatment of mild to moderate obesity with laparoscopic adjustable gastric banding or an intensive medical program: a randomized trial. *Ann Intern Med.* 2006;144:625–33.
- O'Brien PE, McPhail T, Chaston TB, Dixon JB. Systematic review of medium-term weight loss after bariatric operations. *Obes Surg.* 2006;16:1032–40.
- Buchwald H, Avidor Y, Braunwald E, Jensen MD, Pories W, Fahrenbach K, Schoelles K. Bariatric surgery: a systematic review and meta-analysis. *JAMA.* 2004;292:1724–37.
- Dixon JB, O'Brien PE. Changes in co-morbidities and improvements in quality of life after LAP-BAND placement. *Am J Surg.* 2002;184:51S–4S.
- Dixon JB, O'Brien PE. Lipid profile in the severely obese; changes with weight after lap-band surgery. *Obes Res.* 2002;10:903–10.
- Busetto L, Sergi G, Enzi G, et al. Short-term effects of weight loss on the cardiovascular risk factors in morbidly obese patients. *Obes Res.* 2004;12:1256–63.
- Dixon JB, O'Brien PE. Bariatric surgery provides unparalleled metabolic benefits. *Obes Surg.* 2007;17:193.
- Phelan S, Wadden TA, Berkowitz RI, et al. Impact of weight loss on the metabolic syndrome. *Int J Obes.* 2007;31:1442–8.
- Sjostrom L, Narbro K, Sjostrom CD, et al. Effects of bariatric surgery on mortality in Swedish obese subjects. *N Engl J Med.* 2007;23:741–52.
- Adams TD, Gress RE, Smith SC, et al. Long-term mortality after bypass surgery. *N Engl J Med.* 2007;357:753–61.
- Favretti F, Segato G, Ashton WD, et al. Laparoscopic adjustable gastric banding in 1,791 consecutive patients; 12-year results. *Obes Surg.* 2007;17:168–75.
- Christou NV, Sampalis JS, Liberman M, et al. Surgery decreases long-term mortality, morbidity and health care use in morbidly obese patients. *Ann Surg.* 2004;240:416–24.
- Sugerman HJ, Londrey GL, Kellum JM. Weight loss with vertical banded gastroplasty and Roux-y gastric bypass with selective vs random assignment. *Am J Surg.* 1989;157:93–102.
- Brolin RE, Kenler HA, Gorman RC, Cody RP. The dilemma of outcome assessment after operations for morbid obesity. *Surgery.* 1989;105:337–46.
- Hsu LKG, Benotti PN, Dwyer J, et al. Nonsurgical factors that influence the outcome of bariatric surgery; a review. *Psychosom Med.* 1998;60:338–46.
- Lanyon RI, Maxwell BM. Predictors of outcome after gastric bypass surgery. *Obes Surg.* 2007;17:321–8.
- Devlin MJ, Goldfein JA, Flanebaum L, et al. Surgical management of obese patients with eating disorders: a survey of current practice. *Obes Surg.* 2004;14:1252–7.
- Hubbard VS, Hall WH. Gastrointestinal surgery for severe obesity. *Obes Surg.* 1991;1:257–65.
- LeMont D, Moorehead MK, Parish MS, et al. Suggestions for the pre-surgical psychological assessment of bariatric surgery candidates. Allied Health sciences section ad hoc Behavioural Health Committee 2004. American Society for Metabolic and Bariatric Surgery.
- Fabricatore AN, Crerand CE, Wadden T, et al. How do mental health professionals evaluate candidates for bariatric surgery? Survey results. *Obes Surg.* 2006;16:567–73.
- Van Hout GC, Leibbrandt AJ, Jakimowicz JJ, et al. Bariatric surgery and bariatric psychology: general overview and the Dutch approach. *Obes Surg.* 2003;13:926–31.
- Bauchowitz AU, Gonder-Frederick LA, Olbrisch ME, et al. Psychosocial evaluation of bariatric surgery candidates; a survey of present practices. *Psychosom Med.* 2005;67:825–32.
- Sarwer DB, Cohn NI, Gibbons LM, et al. Psychiatric diagnosis and psychiatric treatment among bariatric surgery candidates. *Obes Surg.* 2004;14:1148–56.
- Pawlow LA, O'Neil PM, White MA, et al. Findings and outcomes of psychological evaluations of gastric bypass applications. *Surg Obes Relat Dis.* 2005;1:523–9.

26. Mason EE, Maher JW, Scott DH, et al. Ten years of vertical banded gastroplasty for severe obesity. *Probl Gen Surg.* 1992;9: 280–9.
27. Halverson JD, Zuckerman GR, Koehler RE, et al. Gastric bypass for morbid obesity: a medical-surgical assessment. *Ann Surg.* 1981;194:152–60.
28. Dixon JB, McPhail T, O'Brien PE. Minimal reporting requirements for weight loss: current methods not ideal. *Obes Surg.* 2005;15:1034–9.
29. Sarwer DB, Cohn NI, Gibbons LM, et al. Psychiatric diagnoses and psychiatric treatment among bariatric surgery candidates. *Obes Surg.* 2004;14:1148–56.
30. Gertler R, Ramsey-Stewart G. Pre-operative psychiatric assessment of patients presenting for gastric bariatric surgery (surgical control of morbid obesity). *Aust N Z J Surg.* 1986;56:157–61.
31. Onyike CU, Crum RM, Lee HB, et al. Is obesity associated with major depression? Results from the Third National Health and Nutrition Examination Survey. *Am J Epidemiol.* 2003;158: 1139–47.
32. Sarwer DB, Wadden TA, Fabricatore AN. Psychosocial and behavioural aspects of bariatric surgery. *Obes Res.* 2005;12: 639–48.
33. American Psychiatric Association. *Diagnosis and statistical manual of mental disorders: revision, DSM-III.* 3rd ed. Washington, DC: American Psychiatric Association; 1980.
34. American Psychiatric Association. *Diagnosis and statistical manual of mental disorders: revision, DSM-III-R.* 3rd ed. Washington, DC: American Psychiatric Association; 1987.
35. Glinksi J, Wetzler S, Goodman E. The psychology of gastric bypass surgery. *Obes Surg.* 2001;11:581–8.
36. Herpertz S, Kielmann R, Wolf AM, et al. Does obesity surgery improve psychosocial functioning? *Int J Obes.* 2003;27:1300–14.
37. Gentry K, Halverson JD, Heisler S. Psychological assessment of morbidly obese patients undergoing bypass: a comparison of pre-operative and post-operative adjustment. *Surgery.* 1984;94: 215–20.
38. Gertler R, Ramsay-Stewart G. Pre-operative psychiatric assessment of patients presenting for gastric bariatric surgery (surgical control of morbid obesity). *Aust N Z J Surg.* 1986;56:157–61.
39. Powers PS, Rosemurgy A, Boyd F, Perez A. Outcome of gastric restriction procedures; weight, psychiatric diagnoses, and satisfaction. *Obes Surg.* 1997;7:471–7.
40. Powers PS, Boyd F, Blair CR, et al. Psychiatric issues in bariatric surgery. *Obes Surg.* 1992;2:315–25.
41. Larsen F. Psychosocial function before and after gastric banding surgery for morbid obesity: a prospective psychiatric study. *Acta Psychiatr Scand Suppl.* 1990;359:1–57.
42. Rosik CH. Psychiatric symptoms among prospective bariatric surgery patients: rates of prevalence and their relation to social desirability, pursuit of surgery and follow-up attendance. *Obes Surg.* 2005;15:677–83.
43. Kalarchian MA, Marcus MD, Levine MD, et al. Psychiatric disorders among bariatric surgery candidates: relationship to obesity and functional health status. *Am J Psychiatr.* 2007;164: 328–34.
44. Adami GF, Gandolfo P, Bauer B, Scopinaro N. Binge eating in massively obese patients undergoing bariatric surgery. *Int J Eat Disord.* 1995;17:45–50.
45. Kalarchian MA, Wilson GT, Brolin RE, Bradley L. Binge eating in bariatric surgery patients. *Int J Eat Disord.* 1998;23:89–92.
46. Kalarchian MA, Wilson GT, Brolin RE, Bradley L. Assessment of eating disorders in bariatric surgery candidates: self-report questionnaire versus interview. *Int J Eat Disord.* 2000;28:465–9.
47. Powers PS, Perez A, Boyd F, Rosemurgy A. Eating pathology before and after bariatric surgery: a prospective study. *Int J Eat Disord.* 1999;25:293–300.
48. deZwaan M, Mitchell JE, Howell LM, et al. Characteristics of morbidly obese patients before gastric bypass surgery. *Compr Psychiatry.* 2003;44:428–34.
49. Hsu LK, Mulliken B, McDonagh B, et al. Binge eating disorder in extreme obesity. *Int J Obes Relat Metab Disord* 2002;26: 1398–403.
50. Wadden TA, Sarwer DB, Womble LG, Foster GD, McGuckin BG, Schimmel A. Psychosocial aspects of obesity and obesity surgery. *Surg Clin North Am.* 2001;81:1001–24.
51. Maddi SR, Khoshaba DM, Persico M, et al. Psychosocial correlates of psychopathology in a national sample of the morbidly obese. *Obes Surg.* 1997;7:397–404.
52. Black DW, Goldstein RB, Mason EE. Prevalence of mental disorder in 88 morbidly obese bariatric clinic patients. *Am J Psychiatry.* 1992;149:227–34.
53. Widiger TA, Clark LA. Towards DSM-V and the classification of psychopathology. *Psychol Bull.* 2000;126:946–63.
54. Kutchins H, Kirk SA. DSM-III: the conflict over new psychiatric diagnoses. *Health Soc Work.* 1989;14:91–101.
55. Sadler JZ, Hulgus YF, Agich GJ. On values in recent American psychiatric classification. *J Med Philos.* 1994;19:261–77.
56. Goodwin D, Guze S. *Psychiatric diagnosis.* 4th ed. New York: Oxford University Press; 1989.
57. Clark L, Livesley J, Morley L. Personality disorder assessment: the challenge of construct validity. *J Pers Disord.* 1997;11: 205–31.
58. Kendell R, Jablensky A. Distinguishing between the validity and utility of psychiatric diagnoses. *Am J Psychiatry.* 2003;160: 4–12.
59. Buchanan A. Georges Canguilhem and the diagnosis of personality disorder. *J Am Acad Psychiatry Law.* 2007;35:148–51.
60. Powers PS, Rosemurgy A, Boyd F, et al. Outcome of gastric restriction procedures: weight, psychiatric diagnoses and satisfaction. *Obes Surg.* 1997;7:471–7.
61. Vallis TM, Butler GS, Perey B, et al. The role of psychological functioning in morbid obesity and its treatment with gastroplasty. *Obes Surg.* 2001;11:716–25.
62. Black DW, Goldstein RB, Mason EE. Psychiatric diagnosis and weight loss following gastric surgery for obesity. *Obes Surg.* 2003;13:746–51.
63. Averbukh Y, Heshka S, El-Shoreya H, et al. Depression score predicts weight loss following Roux-en-Y gastric bypass. *Obes Surg.* 2003;13:833–6.
64. Clark MM, Balsiger BM, Sletten CD, et al. Psychosocial factors and 2-year outcome following bariatric surgery for weight loss. *Obes Surg.* 2003;13:739–45.
65. Herpertz S, Kielmann R, Wolf AM, Hebebrand J, Senf W. Do psychosocial variables predict weight loss or mental health after obesity surgery? A systematic review. *Obes Res.* 2004;12: 1554–69.
66. van Hout GCM, Verschure SKM, van Heck GL. Psychosocial predictors of success following bariatric surgery. *Obes Surg.* 2005; 15:552–60.
67. Wadden TA, Sarwer DB, Fabricatore AN, et al. Psychosocial and behavioural status of patients undergoing bariatric surgery: what to expect before and after surgery. *Med Clin N Am.* 2007;91: 451–69.
68. Ryden O, Hedenbro JL, Frederiksen SG. Weight loss after vertical banded gastroplasty can be predicted: a prospective psychological study. *Obes Surg.* 1996;6:237–43.
69. Leombruni P, Piero A, Dosio D, et al. Psychological predictors of outcome in vertical banded gastroplasty: a 6-month prospective pilot study. *Obes Surg.* 2007;17:941–8.
70. Sallet PC, Sallet JA, Dixon JB, et al. Eating behaviour as a prognostic factor for weight loss after gastric bypass. *Obes Surg.* 2007;17:445–51.

71. Burgmer R, Grigutsch K, Zipfel S, et al. The influence of eating behaviour and eating pathology on weight loss after gastric resection operations. *Obes Surg.* 2005;15:684–91.
72. Powers PS, Perez A, Boyd F, et al. Eating pathology before and after bariatric surgery. A prospective study. *Int J Eat Disord.* 1999; 25:293–300.
73. Bocchieri-Ricciardi LE, Chen EY, Munoz D. Pre-surgery binge eating status: effect on eating behaviour and weight outcome after gastric bypass. *Obes Surg.* 2006;16:1198–204.
74. Busetto L, Segato G, De Marchi F, et al. Outcome predictors in morbidly obese recipients of an adjustable gastric band. *Obes Surg.* 2002;12:83–92.
75. Dziurawicz-Kozłowska AH, Wierzbicki Z, Lisik W, et al. The objective of psychological evaluation in the process of qualifying candidates for bariatric surgery. *Obes Surg.* 2006;16:196–202.
76. Sobal J, Stunkard AJ. Socioeconomic status and obesity: a review of the literature. *Psychol Bull.* 1989;105:260–7.
77. National Institute of Health. The practical guide: identification, evaluation and treatment of overweight and obesity in adults. Publication number 00-4084. National Institute of Health, October 2000.
78. van Gemert WG, Severijns RM, Greve JWM, et al. Psychological functioning of morbidly obese patients after surgical treatment. *Int J Obes.* 1998;22:393–8.