



The Obesity Adjustment Survey: Development of a scale to assess psychological adjustment to morbid obesity

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OBJECTIVE: To develop a reliable and valid measure of distress, related to extreme obesity.

DESIGN: Items related to distress over obesity were selected from the literature, clinical experience and from input provided by a gastroplasty patient support group. The items were assessed in a longitudinal study, with the body mass index (BMI) and psychological assessment occurring 2–6 months prior to, and 12 months following, gastroplasty surgery.

SUBJECTS: 81 females and eight males (mean age 35.9 y) who had been accepted for gastroplasty surgery. All but two of the patients had BMIs > 40 (Mean = 48.11, s.d. = 6.84).

MEASUREMENTS: BMIs were calculated using weight and height. Psychological characteristics were assessed using the Mental Health Inventory (MHI), the Sickness Impact Profile (SIP), and the Eating Inventory (EI). Demographic information was collected with a questionnaire.

RESULTS: Attempts to factor analyse the 95 item questionnaire were unsuccessful. Alternatively, a shorter, 20 item questionnaire was developed. The questionnaire shows good test-retest reliability ($r = 0.867$), good internal consistency (coefficient alpha = 0.719), good face and construct validity, and is sensitive to pre-post surgical change.

CONCLUSIONS: The Obesity Adjustment Survey (OAS) may be useful as a brief measure of distress in obese individuals. This measure can be used to index the psychological impact of gastroplasty surgery on psychological functioning, and can be used in future research as a disease-specific measure to predict success of surgery.

Keywords: gastroplasty; morbid obesity; assessment; psychological predictors; quality of life

Introduction

Extreme or morbid obesity is a serious health risk associated with increased mortality and morbidity for several diseases, including coronary artery disease, hypertension, Type-II diabetes, hyperlipidaemia, and joint problems.^{1–9} Medical problems associated with obesity are estimated to represent between 1–5 % of total health care costs.^{10,11}

Morbid obesity is usually defined as either ≥ 100 lb (45 kg) above ideal body weight^{12–14} or 100% above ideal weight.^{5,15,16} Unfortunately, the morbidly obese, respond poorly to traditional approaches to weight loss.^{17,18} Surgical approaches have been developed to successfully treat morbid obesity.^{19,20} Surgical intervention is not without risk however, and post-surgical adherence with suggested eating behaviors (for example, frequency and size of meals, food choices, method of preparation, etc.) is important to ensure success. In a recent review²¹ of psychological predictors for post-surgery weight loss, it was concluded

that psychological distress plays a complex role in surgical outcome. Presurgical psychological distress about obesity was related to greater post surgical weight loss, if no psychopathology was present. In contrast, the presence of serious psychiatric disturbance was associated with a poor surgical outcome. The review also made clear that the choice of outcome measures, which included various psychometric questionnaires and clinician's evaluations, lacked a theoretical basis. The need to develop a questionnaire which would assess patient's distress about their obesity was identified, since these individuals may be most likely to benefit from gastroplasty. A valid questionnaire may also be useful to health teams in identifying patients in need of psychological support, as well as for research purposes (for example, exploring relationships between pre-surgical distress and post-surgical weight loss).

The review revealed that few of the existing scales were appropriate for use in the morbidly obese.²¹ Most studies rely on general measures of psychological adjustment, that is, measures of non-obesity related symptom distress, psychopathology or quality of life.²¹ Such scales are not specific to obesity and do not address the special issues of the morbidly obese (for example, social anxiety because of weight, functional disability due to size, etc.). Most of the psychometric assessment development work, in the area of

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psychological factors in weight, has been devoted to the eating disorders, anorexia nervosa and bulimia nervosa. The Eating Disorders Inventory -2 (EDI-2)²² is the best known of such scales. This scale, or any of its subscales are poorly suited for studying the morbidly obese. For example, the following subscales are part of the EDI: drive for thinness, bulimia, body dissatisfaction, ineffectiveness, perfectionism, interpersonal distrust, interoceptive awareness and maturity fears. The Eating Inventory (EI)²³ is more appropriate to morbid obesity, as it addresses more generic eating issues (for example, restraint, overeating, hunger). For this reason, we decided to incorporate the EI into our clinical assessment of the morbidly obese.

Although the EI is a useful scale, we believe it falls short of providing a global assessment of the psychological adjustment issues, specific to morbid obesity, because it does not assess distress. As a result, we decided to develop our own scale. This paper describes the development and validation of the Obesity Adjustment Survey (OAS), a brief 20 item self-report questionnaire to assess distress about extreme obesity.

Method

Development of the OAS

Stage 1 of item generation, involved a series of meetings for our research team to discuss items. Our team was composed of three bariatric surgeons, each with at least 10 years experience of performing gastroplasty surgery, two clinical psychologists experienced in assessment and treatment of morbid obesity, and a gastroenterologist with an expertise in quality of life assessment and scale development. During these meetings we generated statements (items) believed to represent the experience of the morbidly obese. After generating an exhaustive list of items (approximately 125) we categorized these items by content. This resulted in nine rationally-derived subscales: Distress over Obesity (13 items), Social Concerns (13), Social Support (10), Body Dissatisfaction (6), Health Consequences (6), Functional Disability (10), Self-Efficacy (9), Food and Eating Habits (23) and Exercise (6). The items were written as statements, each of which was rated on a 5-point Likert scale, ranging from 'not at all true' to 'extremely true'. As a general rule, each subscale had 8–12 items, and half of each of the items in each subscale were written in positive, and half in negative, terms (for example, a positively worded item on the distress scale was 'It is depressing to be at my present weight'; a negatively worded item was 'I am content at my present weight'). This balancing of positive and negative wording controls for response bias.²⁴ The items

were scored such that higher scores reflected greater distress.

For Stage 2 of scale development, the OAS (subscales and items) was presented to a local gastroplasty support group. The meeting was attended by approximately 20 people and included individuals who had received gastroplasty surgery, were considering surgery and supporters. Questionnaire items were added, dropped and modified, based upon the feedback received. This process contributed considerably to the content and face validity of the questionnaire.

The initial 125 items were reduced to 95 items, which were formatted into a self-report questionnaire. Written instructions directed the individual completing the questionnaire, to read each statement carefully and decide how true or false the statement was for them. They were asked to use their feelings over the preceding 6–8 weeks as a time frame for their responses. Completion of the 95 items took most patients ≤ 10 min.

Additional Questionnaires

In addition to the Obesity Adjustment Questionnaire, the patients also completed three other questionnaires, chosen to assess eating behavior, quality of life and mental health. The EI²³ is a 51 item questionnaire, that assesses three aspects of eating behavior: cognitive restraint (the active steps the individual takes to limit their intake of food and control their weight), disinhibition (the tendency to overeat in reaction to emotional or social events), and hunger (the intensity of the hunger experience and its relationship to eating). The Sickness Impact Profile (SIP)²⁵ is a 135 item quality of life questionnaire, with 12 subscales covering psychosocial, physical and other dimensions. The Mental Health Inventory (MHI)²⁶ is a 38 item inventory, which assesses psychological well-being and psychological distress.

A self-report questionnaire was used to collect demographic information on the patients. Information obtained included age, level of education, household income, age of onset of obesity and perceived degree of social support.

Patients

Eligible participants included all patients who were accepted for gastroplasty surgery at the Victoria General Hospital and the Camp Hill Medical Centre (since merged as the Queen Elizabeth II Health Sciences Centre) during the period April 1992–February 1994. Potential patients may have been excluded from surgery because of medical problems or psychiatric comorbidity, but once accepted for surgery, all patients were eligible to participate in the study. Formal psychiatric or psychological assessment were not part of the routine screening procedure for surgery. In most cases, it was a positive history of a major psychiatric disorder such as schizophrenia or major depressive episodes, which was considered. In

some cases, individuals with a significant psychiatric history were excluded, while in other cases, the individual was referred to a psychiatrist for assessment of suitability for surgery. It was this state of affairs which, in part, provided the impetus for this study. In point of fact, the number of patients referred with a history of significant psychiatric illness was small, perhaps in part due to pre-screening by referring physicians. The only other criteria for inclusion in the study was that the patient could read English at a grade 6 level.

The study was approved by the hospital's Research Ethics Committee and informed written consent was obtained from all patients. The consent form signed by the patients and the questionnaire instructions, emphasized that the questionnaire was being used for research purposes and would not be used for making clinical decisions regarding gastroplasty or other medical procedures.

Procedure

Patients who met the inclusion criteria were approached regarding participation by their bariatric surgeon at the time of their acceptance for surgery. Patients completed the questionnaires (the OAS, the EI, the MHI, the SIP and the Demographic Questionnaire) either in the psychology department offices, or could complete the questionnaires at home and return them by pre-paid mail.

One hundred and ten patients participated in the presurgery assessment stage (see Figure 1). The waiting period between acceptance for surgery and the surgery date was typically 2–4 months. To assess test-retest reliability of the OAS, 27 subjects assessed between December 1992 and December 1993 were asked to complete the same questionnaires a second time, approximately three weeks prior to the date of their scheduled surgery. The time between the test and re-test averaged approximately seven weeks (2–15 weeks).

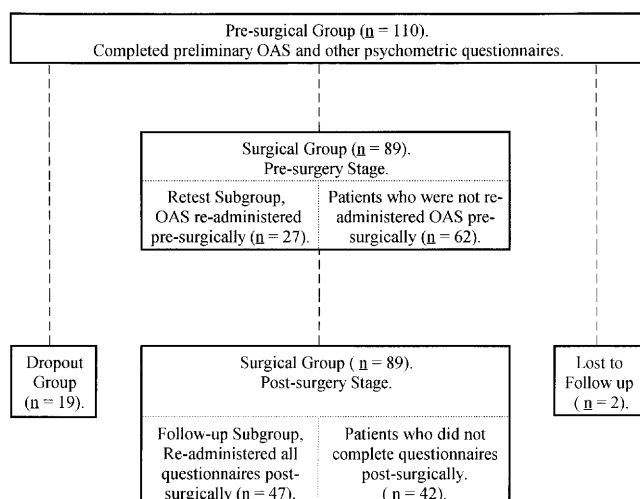


Figure 1 Outline of groups and subgroups.

One year following surgery, 89 of the 110 patients were available for post-surgical follow up (Surgical Group). Nineteen of the original 110 patients withdrew from surgery before the procedure (Dropout Group) and two could not be contacted for follow-up. Post surgical weight data was available for all of the 89 patients in the Surgical Group. In addition, 47 (Follow-Up Subgroup) of the 89 patients in the Surgical Group completed a one-year follow-up assessment, which consisted of the OAS, MHI, SIP, EI and the Demographic Questionnaire. This was a sample of convenience. As many of the patients were from out of town or out of province, local patients were more likely to complete the one-year post-surgery psychological questionnaire battery. Each of the patient groups and subgroups are described and compared below.

Results

Description of Surgical Group (n = 89)

The mean age of the 89 patients (81 female and eight male) in the Surgical Group was 36.77 y (s.d. 8.44 y). Other characteristics of the group are described in Table 1. Of the subjects 63% were married or in a common-law relationship, and most had at least a high school education. The majority were employed and almost half had a family income > \$30 000CDN. They tended to be non-smokers and reported drinking less than one alcoholic beverage a week. Most of the patients had a presurgical body mass index (BMI) in the 40–49 range, 94% reported having close family members who were also 'very much overweight', and approximately half indicated that they had been overweight since the age of 13 y.

Description of the Dropout Group (n = 19)

The 19 patients (two male and 17 female) who withdrew before having surgery, had a mean age of 31.90 y (s.d. 7.59 y) years. Multivariate Analysis of Variance (MANOVA) was used to contrast the initial age, BMI, and psychometric questionnaire results, of this group, with the 89 patients who went on to have surgery. The result of this MANOVA was not significant, $F(17, 90) = 1.02, P = 0.45$, indicating that the Surgical Group did not differ from the Dropout Group on these measures. Chi Square analyses were used to examine group differences for the demographic characteristics. Patients in the Dropout Group were more likely to be smokers (47%) than the Surgical Group (16%), $\chi^2(1) = 9.37, P < 0.01$. No other significant differences were found.

Description of Retest Subgroup (n = 27)

The 27 patients (two male and 25 female) in the Retest Subgroup had a mean age of 36.00 y (s.d.

Table 1 Description of the Surgical Group

	<i>n</i> ^a	%
Gender		
Male	8	9
Female	81	91
Education		
Did not complete High School	20	22
High School	23	26
At least some post-secondary	46	52
Employment		
Full time	36	40
Part time	24	27
Unemployed	24	27
Pension/disability	5	6
Family income (Canadian dollars)		
< 20 000	15	20
20 000–20 999	23	31
30 000–39 999	11	15
≥ 40 000	25	34
Cigarette Smoking		
Never smoked	40	45
Smoked previously, but quit	35	39
Currently smoking	14	16
Alcohol consumption		
Non-drinker	33	37
≤ 1 drinks per week	46	52
> 1 drinks per week	10	11
Age of obesity onset		
< 13 y	43	49
14–19 y	22	25
≥ 20 y	23	26
Presurgical BMI (kg/m ²)		
< 40	2	2
40–49	54	61
50–59	25	28
≥ 60	6	7

^aBased on 89 patients. Due to missing data, totals for some characteristics may not equal 89. BMI = body mass index.

10.55 y). A MANOVA was used to compare the initial age, BMI and psychometric questionnaire results, of this group with the 62 patients who had received surgery, but had not participated in the presurgical retest. The two groups were not significantly different, $F(18,70) = 0.89$, $P = 0.59$. Chi Square analyses were used to examine the demographic data. Only one significant difference emerged. Of the non-retest group 37% reported never drinking, compared to 12% of the Retest Group ($\chi^2(1) = 11.18$, $P < 0.01$).

Description of the one-year Psychometric Follow-up Subgroup ($n = 47$)

The 47 patients (six male and 41 female) in the one-year post surgical psychometric Follow-up Subgroup, had a mean age of 38.60 y (s.d. 8.68 y). MANOVA and Chi Square analyses were used to compare the initial age, BMI, psychometric questionnaire and demographic questionnaire results, of this group with the 42 patients who had received surgery, but did not participate in the one year follow-up. The MANOVA indicated that the groups were different, $F(18,70) = 2.20$, $P = 0.01$. Follow up examination of the univariate F-tests showed that the only factor on which the groups scored significantly differently, was for the Disinhibition scale of the EI, $F(1,87) = 5.02$,

$P = 0.028$. The patients in the Follow-up Subgroup scored higher on the EI Disinhibition scale ($M = 12.52$, s.d. = 2.51) than did the other patients ($M = 11.19$, s.d. = 3.03).

Only two significant differences emerged from the Chi Square analyses. Of the patients who did not complete the psychometric follow-up, 65% reported that they had four or more friends with whom they had discussed their surgery, compared to 36% of the Follow-up Subgroup ($\chi^2(1) = 7.81$, $P < 0.01$). Furthermore, 58% of the patients who did not complete the psychometric follow-up, reported that they had four or more friends who were supportive or helpful with respect to their surgery, compared to 32% on the Follow-up Subgroup ($\chi^2(1) = 6.22$, $P < 0.02$).

Factor analysis

Factor analysis was used with the presurgical OAS data obtained from the entire sample ($n = 110$) to examine whether the subjective classification of items into nine subscales made *a priori* would be empirically supported. Attempts to determine a useful factor structure were unsuccessful, as factor solutions tended to offer a great many factors, with a small number of items per factor. The low ratio of patients to items ($110 : 95 = 1.16 : 1$) most likely contributed to the lack of an interpretable factor analysis. As an alternative to factor analysis, it was decided to examine the statistical properties of the individual test items to derive a shorter questionnaire.

Development of OAS–Short Form Questionnaire

Item selection for a short form of the questionnaire was undertaken in two stages. First, item total correlations (that is, correlations between responses to each individual item and total questionnaire score) were calculated for each of the 95 questionnaire items, using the presurgical OAS data of all 110 patients. The 25 items with the highest item-total correlations were retained. There are no hard and fast rules regarding how many items to select for a short questionnaire,²⁴ but we believed that more than 25 items would make the scale unwieldy in terms of scoring and time to complete. The 25 items had a mean item-total correlation of 0.410, with individual correlations ranging from 0.319–0.559, all P s < 0.01.

The second development stage to create a short form, was to calculate the test-retest reliability of these items. This was made for each of the 25 items, using the test-retest data from the 27 patients who had completed the presurgical retesting. Of the 25 items, 20 showed statistically significant test-retest reliability coefficients, with correlations ranging from 0.382–0.920 and a mean correlation of 0.648 (all P s < 0.05, see Table 2). These 20 items formed the 20-item OAS–Short Form (OAS-SF).

Table 2 Test-re-test and item-total correlations for the 20 items of the Obesity Adjustment Survey–Short Form (OAS-SF)

Item number	Item-total correlation (n = 110)*	Test-retest (n = 27)*	Item
2	0.540	0.472	I am so unhappy that I am too big to exercise as I would like to.
3	0.477	0.920	I avoid showing my body to my partner or close friend.
6	0.338	0.532	I cannot walk even short distances without becoming short of breath and getting very tired.
15	0.331	0.520	I do not avoid public situations like going to stores, parties, or the beach because of my present weight.
17	0.417	0.849	If I stay at the weight I am now, I will probably die sooner than if I weighed less.
25	0.319	0.685	Walking up stairs is especially difficult at my present weight.
38	0.400	0.614	My partner (or close friend) doesn't understand what I go through being overweight.
40	0.385	0.695	I always find a way to eat my favourite foods.
42	0.372	0.580	I avoid looking at my body in a full-length mirror because of my present weight.
46	0.351	0.471	I hate the appearance of my body.
52	0.342	0.650	I believe that being at my present weight is one of the worst things that could happen to me.
53	0.551	0.667	My present weight prevents me from doing social activities that I would enjoy.
59	0.487	0.433	My present weight prevents me from moving around freely.
61	0.403	0.382	I feel more comfortable around people who are overweight than those who are not.
65	0.389	0.759	My sex life would be a lot better if I lost weight.
69	0.439	0.720	I am fat and ugly.
80	0.357	0.617	I am disgusted by my fascination with food.
81	0.401	0.634	I believe that being at my present weight is a sign of personal weakness.
87	0.559	0.510	It is depressing to be at my present weight.
93	0.345	0.800	As a child, I was very inactive and avoided sports or exercise at school.

*all $P_s < 0.001$

**all $P_s < 0.05$

Note: Items are answered using a 5-point Likert scale where 1 = Not at all True, 2 = A Little Bit True, 3 = Somewhat True, 4 = Moderately True, 5 = Extremely True. Items 2, 15 and 80 are reverse scored.

Reliability of the OAS-SF

A total score for the 20-item scale was calculated for each subject, in the test-retest sample, by summing the Likert scale responses, thus scores could range from 20–100. The test-retest reliability of the OAS-SF was very high, $r(25) = 0.867$, $P < 0.001$. Furthermore, there was no significant difference between the initial ($M = 67.17$, $s.d. = 13.28$) and retest ($M = 68.49$, $s.d. = 11.08$) scores indicating that was no systematic increase or decrease of OAS-SF scores between the test and retest.

In addition, Cronbach's coefficient alpha (a measure of the internal consistency of a questionnaire, or the extent to which the questionnaire items are measuring a similar characteristic) was calculated for the 20 items using the data from the original sample of 110 patients. Coefficient alpha for the 20 item form was 0.719 ($n = 110$, $P < 0.001$). This exceeds the recommended value of 0.70 used to indicate internal reliability.²⁴

Validity of the OAS-SF

One indication of the construct validity of a scale, is its positive relationship to other similar scales and lack of relationship with scales which measure different constructs (convergent-divergent validity). The initial OAS-SF scores were compared with the initial scores from the EI, MHI and SIP. The OAS-SF correlated significantly with the MHI Total scale and the MHI subscales as well as the SIP Total, Physical and Psychological Scales (See Table 3), all of which are measures of distress. The correlation between the OAS-SF and the EI, which measures eating behavior, was not significant. Finding a relationship between the OAS-SF and measures of distress, but not with eating

behaviors, helps to support the validity of the OAS-SF. That is, we set out to measure the construct of distress as it applies specifically to morbid obesity, not to measure the construct of eating, as it applies to morbid obesity.

Relationships between the OAS-SF scores and the demographic data were also examined. OAS-SF score was positively correlated with Age, $r(38) = 0.265$, $P = 0.049$, such that older patients reported being more distressed. In addition, OAS-SF was negatively correlated with the number of family members who were reported to 'have a weight problem', $r(87) = -0.32$, $P < 0.001$. That is, patients who came from families with weight problems were less

Table 3 Correlations of the Obesity Adjustment Survey–Short Form (OAS-SF) with the Mental Health Inventory (MHI) and the Sickness Impact Profile (SIP)

Measure	r with OAS-SF ^a
Mental Health Inventory	
Total	– 0.49***
Well being	– 0.50***
General positive affect	– 0.41***
Emotional ties	– 0.37***
Distress	0.44***
Anxiety	0.39***
Depression	0.35***
Loss of behavioral control	0.44***
Sickness Impact Profile	
Total	0.43***
Physical	0.38***
Psychological	0.42***
Eating Inventory	
Cognitive restraint	– 0.14 NS
Disinhibition	0.17 NS
Hunger	0.11 NS

^a $n = 89$.

*** $P < 0.001$.

NS = not statistically significant.

distressed by their weight, than individuals who came from families which had few other overweight members.

Sensitivity of the OAS-SF

As indicated in the section on reliability, the OAS-SF scores were stable during the presurgical period. However, comparison of the presurgical and one-year follow-up data, shows that the OAS-SF is sensitive to change. For the 49 subjects in the Follow-up Subgroup, OAS-SF scores one year post surgery ($M=43.45$, $s.d.=9.92$) were significantly lower than Presurgical scores ($M=68.49$, $s.d.=10.34$), $t(47)=13.47$, $P<0.001$. The improvements in OAS-SF scores paralleled significant weight loss and overall improvements in the patient's quality of life as assessed by the SIP and MHI.²⁷

Discussion

The OAS-SF was developed as an instrument to specifically assess the psychological distress of individuals who are morbidly obese. We followed the steps of item generation, item reduction and examination of test-retest reliability and responsiveness (sensitivity), for the development of the OAS-SF. Development of the instrument began with a large pool of items. A particular strength of the development procedure, was the consultation of the authors with a gastroplasty support group, to refine the original set of questions.

In developing the questionnaire, it was necessary to rely on subgroups of the total initial sample, to assess the test-retest and post-surgical properties of the questionnaires. Statistical comparison of these groups showed them to be essentially equivalent with respect to initial weight and mean scores on the psychometric questionnaires. In addition, the groups were essentially equivalent for the demographic characteristics, with a few minor exceptions (fewer non-drinkers in the Retest Group, fewer friends in the Follow-up Group). We expect that our findings are generalizable for the morbidly obese.

The only significant difference found between the Surgical Group and the Dropout Group, was that a greater percentage of the Dropout Group were smokers. The majority of patients who were smokers were encouraged to quit smoking during their initial meetings with the surgeon. However, we did not track patients with respect to smoking and do not know whether those who were successful were more likely to follow through with surgery. Although our data may suggest that psychological factors (at least those assessed in the current study) do not play a large role in a decision not to proceed with surgery, it may also be that we were unable to detect differences because of the relatively small number ($n=19$) in the Dropout

Group. It may also be that medical and practical (for example, distance from home, financial reasons) factors play a greater role in this decision.

The lack of success in finding a usable factor solution to the original 95 items is puzzling, although the relatively small number of patients ($n=110$) may have been a contributing factor. The recommended ratio of patients to items for a factor analysis is 10:1. In a companion article, currently in preparation,²⁷ we have used cluster analysis to identify four very different groups of patients, based on their presurgical psychometric questionnaire data. It may be that the heterogeneity among potential gastroplasty patients worked against finding a factor solution to the OAS. While our initial scale could not be used to index different constructs subordinate to distress in general, the OAS shortened to the OAS-SF, appears to have the potential of being a useful questionnaire to assess distress specific to morbid obesity and will need to be evaluated further.

Significant correlations between the OAS-SF and measures of functional adjustment (SIP) and emotional adjustment (MHI), and the failure to find significant correlations with the EI, provides support for the construct validity of the OAS-SF. That is, the OAS-SF is more strongly related to measures of distress (SIP, MHI), than it is to measures of eating (EI). The fact that the content of all of the items of the OAS-SF focused specifically on morbid obesity, lends strength to the conclusion that the scale assesses distress over obesity. Validity is also indicated by the finding that the OAS-SF score decreased during the year following surgery, showing that the OAS-SF score is sensitive to changes in BMI. Support for the validity of the OAS-SF might also be taken from its positive correlation with age and negative correlation with number of overweight family members. Older individuals may be more distressed by the effects of their obesity on their health than younger individuals. Furthermore, individuals from families with other overweight members may receive more positive support, and thus be less distressed by their weight.

Conclusion

Although the results reported in this paper suggests that the OAS-SF has good reliability, good validity and is sensitive to change, it requires further evaluation in clinical studies. With further evaluation, the OAS-SF should prove useful to health team members wishing to screen for distress in obese patients and to researchers as a research instrument. For clinical use, a cut-off score which falls 1.5 standard deviations above the mean is proposed. The rationale for using this particular cutoff is consistent with the concept of 'caseness'²⁸ used with other psychometric instruments. Presurgically, individuals whose score falls

above a cut-off score of 85 (1.5 standard deviations above the presurgical mean of 69.40) might benefit from psychological services. Post-surgically, a patient whose score fails to fall below 58 (1.5 standard deviations above the post-surgical mean of 43.46) may be continuing to show signs of distress related to obesity. However, it should be recalled that approximately 2% of patients being considered for surgery may have been excluded because of current major psychiatric illness or a recent hospital admission for psychiatric illness. These exclusions as well as a naturally occurring variation in referral pattern may indicate that the patients in this study may not be entirely representative of morbidly obese patients being considered for surgery in other centers.

Further research is required to determine if the proposed cutoff scores are appropriate. In addition to evaluating the clinical usefulness of the OAS-SF, further research should also address the extent to which OAS-SF scores are predictive of successful post-surgical weight loss.

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