

Psychological Topics 17 (2008), 2, 349-360

Original Scientific Article – UDC 613.25

616.89-008.441.42-085

## Psychological Profile and Quality of Life of Morbid Obese Patients Attending a Cognitive Behavioural Program

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### Abstract

Obesity treatment is finalized to increase physical and psychological health, by reducing body weight, but management of therapy should consider the baseline conditions. We tested the psychological profile of morbid obese patients seeking medical treatment, as a basis for developing more specific therapeutic protocols. 135 consecutive patients with a BMI > 40 mg/kg<sup>2</sup> admitted to an outpatient program of cognitive-behavioural treatment (CBT) were investigated. At enrolment, the patients filled in a series of self-administered questionnaires on binge eating (*Binge Eating Scale, BES*), depression symptoms (*Beck Depression Inventory, BDI*), obesity-specific quality of life (*Obesity-Related Well Being-97, Orwell-97*), and generic health-related quality of life (HRQL) (*Psychological General, Well-Being, PGWB*), where psychological distress is clustered in six domains related to mood states.

The results show that 27% of cases had a BES score  $\geq 17$ , indicative of possible binge eating, and 13% had a BES  $\geq 27$ , largely indicative of binge eating, with a higher prevalence in females. The BDI score was above normal in 30% of males and 45% of females, and 13% of females were in the range of moderate-severe depression. BES and BDI were significantly correlated with each other. Orwell-97 was much higher in females, and similarly the generic PGWB was indicative of a poorer HRQL in females. PGWB was positively associated with age, without any effect of BMI. The association with age was maintained in female, not in males. Both the Orwell-97 and the PGWB were associated with both BES and BDI in both genders. Psychological distress is common and largely variable in patients attending CBT for morbid obesity. This data should be considered for individual treatment protocols, and should be compared with similar series of patients enrolled for bariatric surgery.

**Keywords:** binge eating, depression, health-related quality of life, morbid obesity

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## INTRODUCTION

Obesity is a worldwide-spreading chronic disorder, not limited to metabolic/somatic effects, but with important effects on psychological/psychiatric conditions of affected individuals. Both somatic and psychological/psychiatric factors contribute to severe distress and poor health related quality of life (HRQL) (Marchesini, Solaroli, Baraldi, Natale, Migliorini, Visani et al., 2000; Marchesini, Bellini, Natale, Belsito, Isacco, Nuccitelli et al., 2003; Marchesini, Natale, Tiraferri, Tartaglia, Moscatiello, Marchesini Reggiani et al., 2003; Corica, Corsonello, Apolone, Lucchetti, Melchionda, & Marche, 2006), contributing to the low self esteem, which is the leading cause of treatment failure (Dalle Grave, Calugi, Molinari, Petroni, Bondi, Compare et al., 2005). This is mainly the case of morbidly obese subjects, who are massively exposed to the many misconceptions and generalities that exist about obese persons (Fox, Taylor, & Jones, 2000; Kaminsky & Gadaleta, 2002).

The relationship between psychological distress and obesity is difficult to disentangle, and the two conditions are linked by a vicious circle. Psychological distress may be generated by the social stigma of obesity, present in social situation or at work, but even in the medical setting (Vallis, Butler, Perey, Veldhuyzen van Zanten, MacDonald, & Konok, 2001). Obesity is often viewed as the reflection of a character flaw and psychological problems are erroneously attributed to their character rather than to their obese condition (Vallis et al., 2001), but other authors demonstrated an apparent protective effect of excess body weight on psychological suffering (Friedman & Brownell, 1995).

All this suffering translates into overt psychopathology, partly related to the severity of obesity (Wadden, Sarwer, Womble, Foster, McGuckin, & Schimmel, 2001). Obese women (Istvan, Zavela, & Weidner, 1992; Carpenter, Hasin, Allison, & Faith, 2000), not obese men, have a slightly higher rate of depression and suicidal ideation than their normal-weight counterparts (Istvan et al., 1992; Carpenter, Hasin, Allison, & Faith, 2000). Compared to male, female patients mainly report more symptoms, more disturbed eating, worse social functioning, less active coping, and worse HRQL (van Hout, van Oudheusden, & van Heck, 2004; van Hout, van Oudheusden, Krasuska, & van Heck, 2006), suggesting that female sex may be considered a psychological risk factor. Second generation studies suggest that also extreme obesity and binge eating disorder are markers of an abnormal psychological pattern among obese persons (Friedman & Brownell, 1995), not necessary linked to the duration of obesity (Petroni, Villanova, Avagnina, Fusco, Fatati, Compare et al., 2007).

Different psychological characteristics, personality, and eating behaviour can affect treatment outcomes, and their comprehensive assessment is required to set the most appropriate psychological treatment plan. For this reasons, all subjects entering our treatment program undergo an extensive psychological evaluation. The

aim of the present report was to give a comprehensive picture of the psychological distress of consecutive subjects entering a newly developed behaviour treatment for morbidly obese subjects who do not accept bariatric surgery. This report is part of a larger protocol aimed at defining similarities and differences between subjects opting out for medical treatment and those referring to bariatric surgery.

## METHODS

### *Participants*

We report the data of 135 morbidly obese patients, consecutively entering a weight-reducing behaviour program in our unit of Clinical Dietetics (Table 1). The group consisted of 96 (71%) female and 39 (29%) male patients, with a BMI > 40 mg/kg<sup>2</sup> (range from 40.1 to 67.1), median age 53 years (range from 22 to 75). All had a variable proportion of pharmacologically treated somatic comorbidities (diabetes, hypertension, dyslipidemia).

On entry into the program, obese outpatients had a general medical visit and a nutritional assessment, investigating the quality and quantity daily food intake. In addition, their psychological profile was investigated with several self-administered questionnaires, as was HRQL. For the purpose of the present analysis, we report data on the Binge Eating Scale, the Beck Depression Inventory, the Obesity-Related Well-Being (Orwell) and the Psychological General Well-Being Inventory.

The program consists of a cognitive-behavioural treatment (CBT) finalized to weight loss through a significant change in life style. CBT is organized in 21 group sessions, led by physicians, nutritionists, psychologists and a “psychological trainer/coach”. Patients receive information about the correct life style (including diet and physical activity), learn how to calculate their calorie intake and self-manage their diet, according to their individual health, preferences, working and general needs. Obese patients are also motivated to achieve and maintain their goals in the short and long term.

All subjects signed an informed consent to data handling on admission. The purpose of this analysis was submitted to and approved by the Senior Staff Committee of our department, an institution comparable to an Institution Review Board, handling non-interventional studies.

Table 1. Clinical and psychological characteristics of the sample study

	All cases (n = 135)	Males (n = 41)	Females (n = 94)	Test statistics
Age (years)	53 (18)	53 (13)	53 (21)	$z = 0.21^a$
BMI (kg/m <sup>2</sup> )	45.3 ± 4.9	44.8 ± 3.3	45.6 ± 5.4	$z = 0.14^a$
Diabetes (%)	29.6 (22.2-37.4)	41.5 (26.7-55.5)	24.5 (16.4-33.5)	$\chi^2 = 3.95^{b*}$
Hypertension (%)	61.5 (52.7-68.9)	70.7 (54.3-81.4)	57.4 (46.8-66.5)	$\chi^2 = 2.13^b$
Dyslipidemia (%)	20.0 (13.8-27.1)	19.5 (9.4-32.6)	20.2 (12.9-28.8)	$\chi^2 = 0.01^b$
Binge Eating Scale	8 (20)	1 (15)	8 (22)	$z = 1.84^a$
BES ≥ 17 (%)	26.7 (19.6-34.3)	14.6 (6.1-27.0)	31.9 (22.9-41.3)	$\chi^2 = 1.84^b$
BES ≥ 27 (%)	13.3 (8.3-19.7)	7.3 (1.9-17.8)	16.0 (9.5-24.1)	$\chi^2 = 1.84^b$
Beck Depression Inventory	5 (15)	2 (10)	6 (16)	$z = 2.29^{a*}$
BDI < 10 (%)	59.3 (50.5-66.8)	70.7 (54.3-81.4)	54.3 (43.7-63.5)	
BDI (10 – 16) (%)	15.6 (10.1-22.2)	19.5 (9.4-32.6)	13.8 (7.9-21.6)	
BDI (17 – 19) (%)	11.9 (7.1-18.0)	9.8 (3.2-21.0)	18.8 (7.1-20.4)	$\chi^2 = 9.97^{b*}$
BDI (20 – 29) (%)	8.9 (4.9-14.4)	0 (0.2-6.1)	18.8 (7.1-20.4)	
BDI (≥ 30) (%)	4.4 (1.8-8.9)	0 (0.2-6.1)	6.4 (2.6-12.5)	
Orwell (Total score)	29 (61)	17 (45)	35 (73)	$z = 2.26^{a*}$
Orwell (Impact score)	15 (42)	8 (29)	23 (54)	$z = 2.36^{a*}$
Orwell (Symptoms score)	9 (17)	5 (15)	9 (18)	$z = 1.32^a$
PGWBI (Total score) <sup>c</sup>	66 (26)	72 (23)	62 (24)	$z = 2.15^{a*}$
Anxiety	15 (9)	10 (10)	14 (9)	$z = 0.89^a$
Depression	12 (3)	12 (4)	11 (3)	$z = 1.49^a$
Positivity & Well-Being	10 (6)	12 (5)	9 (5)	$z = 2.38^{a*}$
Self-control	11 (4)	12 (3)	10 (5)	$z = 2.37^{a*}$
General health	9 (5)	10 (4)	8 (4)	$z = 2.28^{a*}$
Vitality	11 (5)	12 (5)	9 (6)	$z = 1.83^a$

Note: Data are expressed as median (interquartile range), mean ± SD, or as % (95% confidence interval)

\* $p < .05$

<sup>a</sup> Mann-Whitney test; <sup>b</sup> Chi-square test; <sup>c</sup> N = 87 (23 males, 64 females)

### Measures

The *Binge Eating Scale* (BES) is a 16-item tool used to discover the presence of binge eating. It examines both behavioural manifestations (eating large amount of food) and feeling/cognition during a binge episode (loss of control, guilt and fear of being unable to stop eating) (Gormally, Block, Daston, & Rardin, 1982). Values ≥ 17 are considered indicative of possible bingeing, whereas values ≥ 27 are considered strongly predictive of a binge eating disorder.

The *Beck Depression Inventory* (BDI) is a 21- question multiple-choice self-report instrument intended to assess the existence and severity of symptoms of depression (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). A total score of 0-9 is considered normal, 10-15 identifies mild depression, 16-19 is mild-moderate, 20-29 is moderate-severe, and ≥ 30 is severe depression (Beck, 1978).

The *Obesity-Related Well-Being 97* (ORWELL-97) is an 18-item Italian instrument exploring obesity-specific quality of life. For each question, the patient is asked to score the intensity (symptom score, from 1 to 4) and the subjective

relevance (social impact, 1 to 4) of a problem (Mannucci, Ricca, Barciulli, Di Bernardo, Travaglini, Cabras et al., 1999). The physical and psychological distress generated by any obesity-related problem is given as the sum of subjective relevance for intensity, and the total sum gives an estimate of psychological distress. High scores are indicative of poor HRQL.

The *Psychological General Well-Being Index* (PGWBI) is a 22-item questionnaire that is used to score the psychological distress in six affective states (anxiety, depressed mood, positive well being, self control, general health and vitality) on a scale from 0 (highest possible distress) to 5 (completely healthy status) (Dupuy, 1984). The maximum possible score is 110 (anxiety, 25; depressed mood, 15; positive well being, 20; self control, 15; general health, 15; vitality, 20). The Italian version of the questionnaire has been recently validated and normative values are available to compare the results with population standards (Grossi, Mosconi, Groth, Niero, & Apolone, 2002). This questionnaire was available only in 87 cases (23 males and 64 females).

#### *Statistical analysis*

A descriptive analysis was carried out by means and standard deviation for normally distributed variables, median and interquartile range (IQR) for non-gaussian variables. Comparison of values between males and females was performed by means of Mann-Whitney test. Nominal variables were tested for differences by chi-square test or Fisher's exact test as appropriate. Correlation between numerical variables was also performed. The significance limit was set at  $p < .05$ .

## **RESULTS**

Our study population had a high prevalence of diabetes (more common in females), hypertension and treated dyslipidemia (Table 1). Among the 135 obese patients, over one fourth of patients had a BES score ( $\geq 17$ ) indicative of a possible binge eating disorder (BED). The prevalence was higher in females, but the difference was not statistically significant. The cut-off of 27, highly suggestive for BED, was again more prevalent in females.

Similarly, several subjects had a BDI score in the pathological range, with a significant difference in relation to gender. In particular, scores in moderate and severe BDI range were only observed in females. The two scores (BES and BDI) were significantly correlated with each other, whereas correlations were neither present with BMI, nor with age (Table 2).

Table 2. Correlation coefficients between age, BMI, scores of psychological questionnaires and health-related quality of life

	BMI	BES	BDI	Orwell-97	Social impact	Physical symptoms	PGWBI <sup>a</sup>
Age	-.01	-.07	-.03	.01	-.02	.06	.23*
Body mass index		.11	.04	-.07	-.08	-.03	-.02
Binge eating scale			.72*	.72*	.70*	.65*	-.44*
Beck depression inventory				.78*	.74*	.76*	-.59*
Orwell-97 (total)					-.98*	.90*	-.36*
Social Impact						.80*	-.35*
Physical Symptoms							-.21*

\* $p < .05$

<sup>a</sup> Based on 87 cases (23 males and 64 females). For correlation with individual scales, see text

BES – Binge Eating Scale; BDI – Beck Depression Inventory; Orwell-97 – Obesity-Related Well Being-9; PGWB – Psychological, General Well-Being

In addition, HRQL was severely affected, particularly in females, but without any significant effect of both age and BMI, with the notable exception of a significant positive correlation between age and PGWBI. Both the total Orwell-97 questionnaire and the Social Impact score were significantly higher in females, whereas the Symptoms score, although again higher in females, did not reach the statistical significance between genders. Similarly, the total PGWB Index was lower in females, as were Positivity & Well-Being, Self-control and General Health, whereas no gender-related differences were observed in Anxiety, Depression, and Vitality. PGWBI was positively associated with age, not with BMI. The association with age was maintained in females ( $r = .29$ ;  $p < .05$ ), not in males ( $r = .04$ ).

Finally, both the Orwell and the PGWBI results were associated with BES and BDI values (Table 2), and the correlations were largely maintained in both genders (not reported in details). Among the different PGWBI scales, the most significant associations were between BES and Vitality ( $r = -.52$ ), Self-control ( $r = -.47$ ) and Positivity & Well-Being ( $r = -.41$ ), whereas BDI was associated with Positivity & Well-Being ( $r = -.61$ ), Vitality ( $r = -.60$ ) and Self-control ( $r = -.56$ ).

## DISCUSSION

The analysis confirms that the burden of obesity in subjects attending a medical weight-loss program is enormous, extending from the somatic area into the psychological/psychiatric domain. This last alteration is largely involved in poor HRQL, as already reported in larger series of Italian subjects, across the whole spectrum of obesity (Marchesini et al., 2000; Corica et al., 2006). Obesity is responsible for enormous suffering, depression, and difficulties in “daily life”. This is mainly the case for morbidly-obese persons, in whom psychological distress

usually correlates with the severity of obesity (Wadden et al., 2001). According to several studies, all obese patients have a poorer HRQL than population samples (Fontaine, Cheskin, & Barofsky, 1996; Kolotkin, Meter, & Williams, 2001), largely related to somatic complications, and psychological distress generated by prejudice and discrimination, which begin in childhood. Among somatic complication, bodily pain is a prevalent problem among obese persons seeking weight loss (Fontaine et al., 1996; Kolotkin et al., 2001), but the mental domains are particularly involved. Very old studies reported that children as young as 6 years old describe silhouettes of an obese child as “lazy, dirty, stupid, ugly, cheats, and liars” (Staffieri, 1967), and obese persons, themselves manifest precisely the same kind of prejudice (Staffieri, 1967; Maddox, Back, & Liederman, 1968). Prejudice and discrimination toward obese individuals persist despite worldwide diffusion of obesity and the recognition of obesity as a health disease. The consequence is that obese patients feel misunderstood, neglected, discriminated, and rejected not only from general people, but also from healthcare professionals (DiGregorio & Moorehead, 1994; Kaminsky & Gadaleta, 2002). Like other forms of prejudice, most obese subjects report that unfavourable attitudes and practices persist, despite laws designed to prevent discrimination based on appearance. A plan for continued education of the medical and non-medical communities has been proposed, to breakdown the barriers in place due to ignorance and indifference most likely is due to lack of understanding of morbid obesity (DiGregorio & Moorehead, 1994; Kaminsky & Gadaleta, 2002).

Among the psychiatric disturbances, binge eating seems to be one of the leading causes of poor HRQL (Marchesini et al., 2000). Binge eating independently increases the risk of weight cycling and associated psychological distress (Marchesini et al., 2004), and subjects with morbid obesity are at larger risk (Petroni et al., 2007). Criteria for binge eating are met when individuals eat objectively large amounts of food, two or more times per week (for at least six months), when they experience loss of control while eating and they feel distressed by their behaviour (American Psychiatry Association, 2000). Binge eating is not accompanied by compensatory behaviours, including purging, fasting, or compulsive exercising, and the excess food ingested during bingeing episodes is a likely trigger of obesity. In community samples, the prevalence of BED is < 5%, but has been estimated to be 7-30% in samples of obese patients seeking weight loss treatment (Stunkard, 2002). In line with these data, the presence of high scores at the BES scale was 28% and 14%, for values in excess of the accepted cut-off of possible and of highly suggestive BED, respectively. A positive correlation has also been reported between the severity of BED and the degree of obesity (Bruce & Agras, 1992), correlation which could not be tested in our sample of subjects all suffering from morbid obesity.

Several studies report that binge eaters have significantly greater psychological distress than obese non-bingers, including depression, anxiety, and obsessive like

behaviour (Marcus, 1993; Yanovski, Nelson, Dubbert, & Spitzer, 1993; Specker, de Zwaan, Raymond, & Mitchell, 1994; Telch & Agras, 1994). Subjects with BED have higher rates of lifetime affective disorder and bulimia nervosa, and axis II cluster B and cluster C diagnoses are found more frequently among BED subjects, together with specific diagnoses of histrionic, borderline, and avoidant personality disorders (Marcus, 1993; Yanovski et al., 1993; Specker et al., 1994; Telch & Agras, 1994). Whereas obesity and scores of psychiatric symptomatology are not always related, a significant positive relationship exists between binge eating severity and the degree of psychiatric symptomatology, suggesting that binge eating may account for the observed relationship between obesity and psychopathology reported in previous studies (Marcus, 1993; Yanovski et al., 1993; Specker et al., 1994; Telch & Agras, 1994).

Extremely obese persons appear to be at greater risk of psychological distress than moderately obese individuals (Wadden et al., 2001). In our sample with morbid obesity, 40% of patients seem to have signs of depression and nearly 20% show signs of moderate-severe depression. Interestingly, all patients in the highest class belong to female gender, in fairly good agreement with the literature (Halbreich & Kahn, 2007). Depression might also be the result of comorbidities and chronic illnesses, frequently associated with obesity (Benton, Staab, & Evans, 2007), and a bidirectional relationship has been reported between obesity and depressive disorders (Benton et al., 2007). However, the majority of our subjects did not show signs of depression (median BDI = 5), and would be interesting to investigate which factors prevent psychological distress.

Results from longitudinal studies suggest that depression precedes obesity in adolescent girls, but not boys, and that obesity precedes depression in older adults, whereas baseline obesity does not predict follow-up depression (Goodman & Whitaker, 2002; Richardson, Davis, Poulton, McCauley, Moffitt, Caspi et al., 2003; Roberts, Deleger, Strawbridge, & Kaplan, 2003). After adjusting for baseline body mass index, depressed late adolescent girls are indeed at a greater than 2-fold increased risk for obesity in adulthood compared with non-depressed female peers, and a dose-response relationship is observed between the number of episodes of depression during adolescence and risk for adult obesity in females (Goodman & Whitaker, 2002; Richardson et al., 2003; Roberts et al., 2003). These data are confirmed in the Alameda County study, where obesity at baseline was associated with increased risk of depression 5 years later, after controlling for depression at baseline and several covariates. The reverse is not true, and depression at baseline does not increase the risk of future obesity (Goodman & Whitaker, 2002; Richardson et al., 2003; Roberts et al., 2003).

These data are also supported by the positive association we found between age and PGWB index, in keeping with a larger psychological distress in young people. This result should also be analyzed in the context of the progressive decline in HRQL observed with aging in the general population (Dupuy, 1984); young



subjects with obesity are therefore at even larger risk of severe distress, when considered with an age-matched population. This is mainly the case for the subscales of Anxiety, Positivity & Well-Being and Vitality, which are most affected in this population.

The report has limits that should be considered. First, data are not exhaustive of a comprehensive assessment of the mood states and psychopathology of obese persons, and other areas should be tested. In particular, the psychiatric profile may be added to our battery of tests, and previous experience with the Symptom Check-List 90 questionnaire, a well-validated questionnaire (Derogatis & Cleary, 1977), has already provided relevant data (Petroni et al., 2007). Similar interest should be devoted to body image representation (Cuzzolaro, Vetrone, Marano, & Garfinkel, 2006), frequently disturbed in these patients and particularly in young females (Marano, Cuzzolaro, Vetrone, Calugi, Dalle Grave, Marchesini et al., 2007), who are at great risk of treatment attrition (Dalle Grave et al., 2005). Secondly, the analysis is limited to subjects attending a medical Unit and the results cannot be transferred to other groups. Psychological distress might be different in morbid obese subjects not seeking treatment – and the reasons for not considering their condition should be studied – as well as in subjects opting out for bariatric surgery.

In summary, although the mechanisms responsible for the high rates of psychological distress may largely vary within morbid obese patients, the increased risk of clinical co-morbidities, a higher experience of discrimination and prejudice, and a worse HRQL may be variably involved. The present culture, in which thinness is idealized, exacerbates the problem, and getting a definite psychological profile of individual patients will help develop individualized treatment plans (Lang, Hauser, Buddeberg, & Klaghofer, 2002), and to choose between medical and surgical treatment, also avoiding treatment failures.

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Received: 04/06/2008