

Psychological Symptoms in People Presenting for Weight Management

Cheryl B L Loh,¹ MBBS, M Med (Psychiatry), Yiong Huak Chan,² BMaths (Hons), PGDip (AppStats), PhD

Abstract

Introduction: Elevated levels of psychopathology have been described in various groups of obese patients. This study aimed to describe the presence of depressive and binge eating symptoms in patients presented for clinical weight management at a general hospital in Singapore, as well as their health-related quality of life (HRQOL). Correlations between these symptoms and other demographic and clinical variables were also sought. **Materials and Methods:** Patients presented at a clinical weight management programme were asked to complete the Beck Depression Inventory (BDI), Binge Eating Scale (BES) and the Short Form-36 (SF-36). Clinical and demographic data were also collected. **Results:** Of the group, 17.1% reported moderate or severe binge eating symptoms and 9.7% reported moderate or severe depressive symptoms. HRQOL, mostly in physical health domains, was lower in this sample compared to local norms. Within the group, binge eating and depressive symptoms, but not increasing obesity, predicted poorer HRQOL. **Conclusions:** Psychological symptoms are significantly present in patients presented for clinical weight management and these contribute to poorer quality of life. Addressing these symptoms will improve the overall well-beings of these patients and the total benefits gained will exceed the benefits of weight loss per se.

Ann Acad Med Singapore 2010;39:778-82

Key words: Binge eating, Depression, Obesity, Quality of life

Introduction

Multiple factors contribute to the genesis and maintenance of obesity which is a difficult condition to treat and weight loss is often not maintained. The psychological problems found in obese patients have recently received increasing attention. Many recent studies have found increased levels of depression, anxiety and binge eating disorder among patients seeking clinical weight management. One study conducted on bariatric surgery candidates found that they had almost 4 times elevated rate of major depression (19% vs 5%) compared with non-obese controls.¹

The first part of our study looks at the prevalence of depressive and binge eating symptoms in a Singaporean clinical population presented for weight management.

In a society where trim figures are highly prized, obesity can sometimes lead to disappointments when finding jobs and making friends. Also, depressive illnesses are often characterised by changes in appetite, low energy levels and lack of interest in activities – all of which might contribute to weight gain. Together with a sense of low self-efficacy,

these symptoms hinder weight reduction, which requires diet control and increased participation in exercise.

Binge eating is studied because it is often associated with depressed mood and is of particular interest in post-bariatric surgery patients who need to control their eating habits. Binge eating is defined as recurrent episodes of eating a large amount of food rapidly and having a sense of loss of control over eating. Eating, in this case, is usually not related to hunger and patients will eat until uncomfortably full. It is associated with mental preoccupations with eating and guilt about over-eating. Binge eating has been studied both as a symptom itself and as a mediating factor between depressed mood and obesity. A study of obese subjects found a prevalence of 51% for major depressive disorder among those suffering from binge eating versus 14% in those without.² In addition, the current study investigates the link between being depressive and binge eating symptoms in our patients.

The direction of causality between mood and obesity is far from conclusively known. Bejerkeset et al³ found

¹ Department of Psychological Medicine, Changi General Hospital

² Biostatistics Unit, Yong Loo Lin School of Medicine, National University of Singapore

Address for Correspondence: Dr Cheryl Loh, Department of Psychological Medicine, Changi General Hospital, 2 Simei Street 3, Singapore 529889.

Email: cheryl_loh@cgh.com.sg

that the baseline body mass index (BMI) was associated with depression in a cohort followed-up over a period of 20 years, while another study (Hasler et al⁴) found that the baseline depression was associated with later obesity. Outcome studies from weight loss programmes and bariatric surgery show varying effects on measures of psychological symptoms.^{5,6} We cannot assume that the increased psychopathology found in patients presenting for weight management will disappear with weight reduction. Also, if the psychological symptoms contributed significantly to obesity, failure to treat them would result in recurrence of weight gain.

The second part of our study looks at the parts obesity and psychological symptoms play in a measure of overall quality of life. Obesity has previously been found to be associated with lower quality of life in several physical domains.⁷ We first measured quality of life using the Short Form-36 (SF-36) and then sought to find its associations with the levels of obesity or psychopathology. This then suggests whether it is obesity per se that impairs quality of life, or the presence of psychological symptoms that causes distress and lowers perceived quality of life. This will also help us to understand the importance of psychological intervention for those in weight management programmes and are having concurrent psychological symptoms.

Materials and Methods

All new cases aged between 21 and 65 years old presented for the first time at the weight management programme at Changi General Hospital between October 2006 and October 2007 were invited to participate. Basic patient data such as age, gender, race, history of medical and psychiatric illness and BMI were gathered from the case sheet review.

The patients were then asked to fill in a one-time self-reported questionnaire consisting of Beck Depression Inventory (BDI), Binge Eating Scale (BES), Short Form-36 (SF-36) and Health-related quality of life (HRQOL) scale. BDI is a widely used measure of depressive symptoms whereas BES is a measure of binge eating habits and cognitions. Neither BDI nor BES are diagnostic tests though scoring categories for delineating minimal, mild, moderate and severe symptoms have been established. However, both are easily self-administered, and are often used in studies of obesity and mood and have been extensively tested for validity and reliability although not in local populations. The scores and categories are shown in Tables 1 and 2.

SF-36 is the most commonly used generic instrument for medical outcomes. Local norms were published in 2002⁸ and the scores are broken down into 8 domains, namely: (i) physical functioning, (ii) role limitation due to physical problems, (iii) bodily pain, (iv) general health, (v) vitality, (vi) social functioning, (vii) role limitation due to emotional

Table 1. Scoring for Binge Eating Scale (BES)

Category	Score
Minimal	0-13
Mild	14-19
Moderate	20-28
Severe	29-63

Table 2. Scoring for Beck Depression Inventory (BDI)

Category	Score
Minimal	0-13
Mild	14-19
Moderate	20-28
Severe	29-63

problems and (viii) emotional well-being. Raw scores are transformed to a 0 to 100 scale where 0 is the lowest possible score which usually denotes impairment and deficits and 100 is the highest score obtainable which denotes no limitations or problems in that area. The scores are used in comparison with the norms for a given population. In this study, we compared the obese patients (our study cohort) with the general Singapore population.

Data were analysed using Statistical package for Social Sciences (SPSS) version 17.0. Differences for continuous variables between groups were tested using *t*-test when normality and homogeneity assumptions were satisfied; otherwise, the non-parametric Mann Whitney U test was applied. Chi-squared test or Fisher's Exact test for categorical variables with odds ratio were presented where applicable. Pearson's or Spearman's correlation was used to present the linear relationship between 2 quantitative variables. One Sample T-test or Wilcoxon Signed rank test was used to assess the SF-36 domains of the subjects subgrouped by gender with the norm in Singapore. Finally, a linear regression was performed to determine significant predictors on the quality of life outcomes and a logistic regression for severe BES or BDI. $P < 0.05$ was considered statistically significant.

Results

Group Characteristics

In the 1-year study period, a total of 184 patients aged between 21 and 65 years old were enrolled in the weight management programme. Eighty-two patients agreed to complete the 3 questionnaires. Participants were significantly younger than non-participants ($P = 0.001$) and females were less likely to participate ($P = 0.018$). The 2 groups did not differ otherwise.

Of the 82 participants, 53.7% ($n = 44$) were female and the remaining 46.3% ($n = 38$) were male. Their age ranged from 21.7 to 64.3 years old, with a mean age of 40.2 years and a median age of 40.2 years. The ethnic group was 65.9% ($n = 54$) Chinese, 22% ($n = 18$) Malay, 11% ($n = 9$) Indian and 1.2% ($n = 1$) classified as “Others”.

The BMI from this group ranged from 23.2 to 61.9 kg/m². The mean and median BMI were 33.3 kg/m² and 32.3 kg/m², respectively. The overweight and obese patients comprised 51.3% of the group and the severely and morbidly obese patients comprised 48.7% of the group.

Comorbid medical conditions were common. Of all the participants, 65.9% had at least 1 chronic medical condition. Orthopaedic problems were the most common (36.6%), followed by vascular risk factors such as hypertension (26.8%) and raised serum lipids (23.2%).

Comorbid or past history of psychiatric conditions were rare in the study group. Only 4 participants (4.9%) reported a history of psychiatric disorder – 1 with anxiety disorder and 3 with mood disorder. None of them were on treatment or follow-up at the point of entering the study.

Psychological Scales

Scores on the Binge Eating Scale (BES) for the group ranged from 0 to 33 and the distribution of scores is shown in Table 3. The mean ($\pm$ standard deviation) score was 10.73 (± 6.8) and the median score for the group was 10.0.

Moderate and severe symptoms were found in 17.1% of the group and these patients were significantly more likely, compared to those with no or mild symptoms, to have a past history of psychiatric condition [Odds ratio (OR), 18.3; 95% confidence interval (CI), 1.7–191.8].

The distribution of scores on the BDI is shown in Table 4. The scores ranged from 0 to 30, with a median score of 7.0 and a mean score of 9 with standard deviation of 7.25.

Table 3. Distribution of Binge Eating Scale (BES) Scores

Score category	No. of participants	%
Nil or Mild	68	82.9
Moderate	13	15.9
Severe	1	1.2

Table 4. Distribution of Beck Depression Inventory (BDI) Scores

Score category	No. of participants	%
Minimal	60	73.2
Mild	14	17.1
Moderate	7	8.5
Severe	1	1.2

In this group, 9.7% of them who had moderate to severe depressive symptoms were significantly more likely to have severe and morbid obesity [OR, 8.7; 95% CI, 1.02–74.3].

On multivariate analysis, none of the demographic variables or clinical history variables were significantly predictive of more severe BES or BDI scores. More severe BES scores (moderate and severe range) were not predictive of more severe BDI scores (moderate and severe range) [OR, 3.4; 95% CI, 0.72–16.5]. However, a relationship between binge eating and depression was supported by the positive correlation between the absolute scores on the 2 scales ($r = 0.459$; $P < 0.01$).

Health-Related Quality of Life (SF-36) Scores

SF-36 scores for the participants were collated and compared to the norms in Singapore, which are classified by gender and race. Overall, the different subgroups showed impairments in various domains. Only Indian males showed no impairments compared to their population norms. In general, the domains affected were related to physical health.

The significant differences between the participant groups and local norms are summarised in Table 5.

None of the demographic variables – age, gender, race and severity of obesity – were associated with significant deficits on quality of life scores in any domain. When adjusted for the other variables, the severity of binge eating

Table 5. Significant Differences in Quality of Life (SF-36) Scores Between Study Group and Singapore Norms

Race/ Gender	Domains affected	Mean for Singapore norms	Mean for study group	P
Chinese				
Female	Physical functioning	83.6	75.2	0.048
	Role limitations due to physical health	87.7	68.9	0.046
	General health	69.9	55.8	0.001
Male	Social functioning	83.9	86.9	0.043
Malay				
Female	Bodily pain	77.0	58.5	0.042
Male	Vitality	66.3	55.3	0.010
	Bodily pain	78.2	60.6	0.013
	General health	68.6	49.2	0.005
Indian				
Female	General health	70.0	50.8	0.026
Male	-	-	-	-

was found to impact only the domain of role limitation due to emotional problems ($P = 0.024$).

The severity of depressive symptoms was found to impact on multiple domains of the SF-36—that is (i) emotional well-being, (ii) role limitations due to emotional problems, (iii) social functioning and (iv) pain. A summary of the significant effects are shown in Table 6.

Table 6. Impact of Depressive Symptoms Scores on SF-36 Domains

Domain	Mean and 95% CI for minimal and mild BDI scores	Mean and 95% CI for moderate and severe BDI scores	P
Emotional well-being	66.0 (56.9-75.1)	53.2 (38.7-67.8)	<0.001
Role limitation due to emotional problems	79.3 (62.2-96.5)	41.0 (13.5-68.6)	0.002
Social functioning	76.2 (64.1-88.3)	43.7 (24.3-63.2)	<0.001
Pain	70.6 (57.2-84.0)	44.7 (23.2-66.3)	0.008

95% CI: 95% confidence interval; BDI: Beck Depression Inventory

Discussion

Psychological Symptoms

There have been no previous local studies of binge eating prevalence. Overseas studies have reported binge eating disorder prevalence of 2% of community samples and up to 30% of individuals seeking weight loss treatment.⁹ The mean and median scores for our study group fall in the category for minimal symptoms. However, moderate to severe binge eating symptoms were reported by 17.1% of this study group. The only association found was with a history of past psychiatric illness. Although there were very few such patients and none had an eating disorder, it does suggest that more attention might be paid to screening this group and that binge eating might accompany other psychiatric symptoms. Patients with psychiatric problems have other risk factors such as medication-induced weight gain, decreased physical activity due to social isolation and financial difficulty for being overweight. A careful elucidation of the contributory factors to weight gain in these patients is necessary and specific intervention such as cognitive behavioural therapy aimed at binge eating can then be used to appropriately aid weight loss.

The severity of binge eating was not associated with the severity of obesity. This is similar to previous studies¹⁰ and it suggests that the relationship between obesity and binge eating may be qualitative rather than quantitative. Binge eating behaviour consists not only of increased and rapid eating; it is also frequently accompanied by distressing feelings of loss of control, guilt and self-disgust. Thus a patient with a high level of binge eating cognitions may not

necessarily have eaten more and experienced more weight gain. Eating more and weight gain are also determined by environmental factors such as the availability of food and social barriers to excessive eating.

The mean and median scores for the BDI also signify, on average, minimal symptoms. However, 9.7% of the study group had moderate to severe depressive symptoms, suggesting an excess of depressive disorders when compared to the general population. The recent large epidemiological survey conducted in 2004 found the prevalence of depressive disorders among Singaporeans to be 4.9%.¹¹ There was a significant association with severe and morbid obesity and this was in agreement with an earlier large study conducted.¹² Many of those with severe and morbid obesity were candidates for bariatric surgery so screening of surgical candidates might be more effective. Pre- and post-surgery depressive symptoms need to be treated to enhance cooperation with care instructions, compliance with dietary restrictions and early return to normal activities.

Previous studies have suggested that binge eating is the mediator between mood symptoms and obesity. Although there was a positive correlation between BDI scores and BES (Pearson's Correlation 0.459, $P < 0.01$), the severity of binge eating could not predict BDI score on multivariate analysis. A small sample size could have resulted in an inability to find a significant association and this finding needs to be replicated in a larger study.

Health-Related Quality of Life Scores

The scores on the HRQOL scale (SF-36) supported the idea that obese patients have lower perceived quality of life in various domains. This can be seen in the differences shown by our study group participants when compared to the norms in Singapore. Most of the affected domains such as physical function, role limitations due to physical problems, bodily pain, general, were related to physical health. This finding is similar to other findings from other large quality of life studies conducted in obese populations. In a large recent study of an Asian population which quality of life was assessed in 14,221 Taiwanese subjects, excess weight was found to be related to impairments in physical health but not mental health-related domains of the SF-36.⁷

Our study also suggests that within the group, it is psychological factors that cause additional distress. In multivariate analysis, only the severity of depressive symptoms and binge eating symptoms positively predicted lower SF-36 domain scores.

Binge eating symptoms were associated with impairment in a mental health domain - role limitation due to emotional problems. This is consistent with its postulated relationship with mental distress. Studies in this area conducted elsewhere have shown the nature of this relationship inconclusive. One

large study has found that the accompanying obesity and other psychological variables alone could account for the mental distress,¹³ while another concludes that binge eating itself is a significant health problem and it adds on to the effects of obesity alone.¹⁴

Depressive symptoms were associated with poorer health-related quality of life in physical (pain), emotional (emotional well-being, role limitation due to emotional problems) and social functioning domains. This suggests that depressive mood impacts the quality of life in many areas, not just the emotions. This has been a common finding in the literature regarding the quality of life in obese patients with depressive symptoms.^{15,16}

The finding that psychological symptoms, not severity of obesity, impacts the quality of life in this cohort of obese patients, suggests that psychological interventions, not just weight loss alone, are necessary to improve the quality of life in the obese patients.

Limitations

The response rate was lower than the expected 44.6%. The small sample size made it difficult to find significant statistical relationships. Both obesity and mental health are surrounded by considerable stigma and weight management patients might resist mental health surveys for fear of being further labelled. The stigma surrounding mental health poses a serious challenge to survey the psychological needs in non-psychiatric clinical groups.

Conclusions

This study suggests that there is significant correlation between prevalence of depressive and binge eating symptomatology in our patients presented for weight management. They might represent an undiagnosed problems which need psychiatric intervention. Psychological symptoms, resulted in poorer perceived health-related quality of life, should be targeted in tandem with absolute weight loss to enhance the patient's overall well-being.

Acknowledgements

The authors would like to acknowledge the support received from the doctors and staff of the CGH Department of Sports Medicine.

REFERENCES

1. Black DW, Goldstein RB, Mason EE. Prevalence of mental disorders in 88 morbidly obese bariatric surgery clinic patients. *Am J Psychiatry* 1992;149:227-34.
2. Yanovski SZ, Nelson JE, Dubbert BK, Spitzer RL. Association of binge eating disorder and psychiatric comorbidity in obese subjects. *Am J Psychiatry* 1993;150:1472-9.
3. Bjerkeset O, Romundstad P, Evans J, Gunnell D. Association of adult BMI and height with anxiety, depression and suicide in the general population: the HUNT study. *Am J Epidemiol* 2008;167:193-202.
4. Hasler G, Pine DS, Kleinbaum DS, Gamma A, Luckenbaugh D, Ajdacic V, et al. Depressive symptoms during childhood and adult obesity: the Zurich cohort study. *Mol Psychiatry* 2005;10:842-50.
5. Dixon JB, Dixon ME, O'Brian PE. Depression in association with severe obesity: changes with weight loss. *Arch Intern Med* 2003;163:2058-65.
6. Wadden TA, Stunkard AJ, Liebschutz J. Three-year follow-up of the treatment of obesity by very low calorie diet, behaviour therapy, and their combination. *J Consult Clin Psychol* 1988;56:925-8.
7. Huang IC, Frangakis C, Wu AW. The relationship of excess body weight and health-related quality of life: evidence from a population study in Taiwan. *Int J Obes* 2006;30:1250-9.
8. Thumboo J, Chan SP, Machin D, Soh CH, Feng PH, Boey ML, et al. Measuring health-related quality of life in Singapore. Normal values for the English and Chinese SF-36 health survey. *Ann Acad Med* 2002;31:366-74.
9. Spitzer RL, Devlin M, Walsh BT, Hasin D, Wing R, Marcus M, et al. Binge eating disorder: a multisite field trial of the diagnostic criteria. *Int J Eat Disord* 1992;11:191-203.
10. Telch CF, Agras WS. Obesity, binge eating and psychopathology: are they related? *Int J Eat Disord* 1994;15:53-61.
11. Chua HC, Lim L, Ng TP, Lee T, Mahendran R, Fones C, et al. The prevalence of psychiatric disorders in Singapore adults. *Ann Acad Med Singapore* 2004;33(Suppl 5):S102.
12. Britz B, Siegfried W, Ziegler A, Lamertz C, Herpertz-Dahlmann BM, Remschmidt H, et al. Rates of psychiatric disorders in a clinical study group of adolescents with extreme obesity and in obese adolescents ascertained via a population based study. *Int J Obes* 2000;24:1707-14.
13. Kolotkin RL, Westman EC, Ostbye T, Crosby RD, Eisonson HJ, Binks M. Does binge eating disorder impact weight-related quality of life? *Obes Res* 2004;12:999-1005.
14. Rieger E, Wilfley DE, Stein RI, Marino V, Crow SJ. A comparison of quality of life in obese individuals with and without binge eating disorder. *Int J Eat Disord* 2005;37:234-40.
15. Marchiesini G, Bellini M, Natale S, Belsito C, Isacco S, Nuccitelli C, et al. Psychiatric distress and health-related quality of life in obesity. *Diabetes Nutr Metab* 2003;16:145-54.
16. Kalarchian MA, Marcus MD, Levine MD, Courcoulas AP, Pilkonis PA, Ringham RM, et al. Psychiatric disorders among bariatric surgery candidates: relationship to obesity and functional health status. *Am J Psychiatry* 2007;164:328-34.