

# **Psychosocial Profile of Bariatric Surgery Candidates and the Correlation between Obesity Level and Psychological Variables**

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## **ABSTRACT**

Bariatric surgery has proven to be the most effective treatment for severe obesity. Weight loss and long-term maintenance depend on patient's ability to implement permanent lifestyle changes. Presurgical psychological evaluation and intervention are proposed for a better post surgical prognosis. The aim of present study was to make a psychosocial profile with the results of psychological evaluation performed to 129 bariatric surgery candidates and to determine associations between psychological variables with obesity level. Patients were evaluated with an oral interview, the MINI International Neuropsychiatric Interview, and the following self-reported instruments: Beck Depression Inventory, Anxiety Sensitivity Inventory, Stress Control Perception, Risk Factors related to Eating Behavior Disorders Scale, Quality of Life and Health Inventory. Study population was divided in groups according to obesity level, evaluation results were compared according to these groups. Results in present study show a high prevalence of psychiatric disorders; obesity level was not directly associated with level of psychopathology. Another finding is that at higher level of obesity, there is less concern about weight and food and also there is a significant higher perception of family support. The group of patients with higher concerns about weight and food had lower BMI and less perception of family support.

*Key words:* bariatric psychology, obesity, psychological profile, cross sectional descriptive study.

World Health Organization (WHO, 2006) declared obesity as "a global epidemic". Obesity is defined as an abnormal or excessive fat accumulation that represents a plethora of health risks. Obesity is mainly the result of consuming more energy than body requires. There are other factors involved in its etiology like genetics, environment, socioeconomics, psychological, sedentarism, hormonals, and so (Feldman & Christensen, 2008).

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It is identified by Body Mass Index (BMI) ( $\text{kg}/\text{m}^2$ ) parameter; overweight is defined as  $\text{BMI} \geq 25 \text{ kg}/\text{m}^2$  and obesity as  $\geq 30 \text{ kg}/\text{m}^2$ . According to WHO statistics, in 2005 at least 400 million people in the world were obese, and projections for 2015 are that, 2300 million people will be overweight and more than 700 million people will be obese.

Overweight and obesity are risk factors for diabetes, coronary diseases, high blood cholesterol levels, stroke, arterial hypertension, gallbladder diseases, osteoarthritis, obstructive sleep apnea, respiratory problems, and some types of cancer. Bariatric Surgery is one of the most effective treatments for patients with morbid obesity; it is indicated for patients with  $\text{BMI} \geq 40 \text{ kg}/\text{m}^2$  or  $\geq 35 \text{ kg}/\text{m}^2$  in case of associated comorbidities. Recently, the FDA has cut down the BMI requirement for lap-band procedures to  $30 \text{ kg}/\text{m}^2$ . Presurgical psychological evaluation and intervention are proposed for a better post surgical prognosis, better patient's satisfaction about treatment, and also to identify specific cases in need of psychological intervention to improve surgical outcomes (Greenberg, Sogg, & Perna, 2009). It has been reported that negative anemic states, emotional eating, unrealistic expectations about surgery and poor or inadequate knowledge about surgery procedures, its risks, and the need for a lifestyle change, are related to poor adherence to nutritional and physical activity indications. The latter is related to less weight loss, lower patient's satisfaction and less post surgical success (Bauchowitz, Gonder-Frederick, Olbrisch *et al.*, 2005; Kinzl, Schrattecker, Traweger *et al.*, 2006; Marcus, Kalarchian, & Courcoulas, 2009; Pull, 2010).

Obesity is a health problem not only related to physical risks (Kral, 2001), but also to a great variety of psychological symptoms such as body concerns, depressed mood, low self esteem (Kalarchian, Marcus, & Levine, 2007; Petri, Barry, Pietrzak, & Wagner, 2008; Werrij, Jansen, Mulken, Elgersma, Ament, & Hospers, 2009) and discrimination (Magallares, Morales, & Rubio, 2011). It has been reported that patients seeking for bariatric surgery have higher prevalence of psychiatric disorders like depression and eating behavior disorders than those who are not and that these psychiatric disorders as well, are related to higher levels of obesity (Kessler, Berglund, Demler, Jin, Merikangas, & Walters, 2005). Obesity has also been found to increase the risk of depression (Hayden, Dixon, Dixon, Shea, & O'Brien, 2010; Luppino, de Wit, Bouvy *et al.*, 2010).

Not all patients undergoing bariatric surgery get benefits from it; there have been significant variations in weight loss at short and long term after surgery (Kinzl *et al.*, 2006); an example is that 20% of patients undergoing weight loss surgery don't lose significant weight or regain it at a short time period (Greenberg *et al.*, 2009).

There is not enough evidence to support psychopathology as a contraindication for bariatric surgery, however, as psychopathology as well as other psychological factors can impact surgery's outcome, presurgical psychological evaluation can identify behavioral and psychological factors that could affect patient's safety and efficacy of surgery (Dwyer, 1998; Greenberg *et al.*, 2009; Hsu, Benotti, & Dwyer, 1998).

A Psychologist's role in a bariatric surgery multidisciplinary team should consist on initial evaluation of bariatric surgery candidates in order to determine patient's ability to make required lifestyle changes before and after surgery, to offer psychoeducation to patients in order to prepare them for these changes and to help them make an informed decision about undergoing or not surgery. Psychoeducation helps patient to

develop more realistic expectations about results of the surgical procedure, to decrease feelings of uncertainty which on the other hand usually generates anxiety; psychologist should focus on motivation and adherence to lifestyle changes through cognitive and behavioral techniques as well as into continuous education for patients. By perceiving closeness with multidisciplinary group, patients feel more safely which impacts on a better therapeutic adherence (Moorehead, 2008).

Given that knowing psychosocial profile of bariatric surgery patients is mandatory to achieve better results, the aim of this study was to carry out a psychosocial profile of bariatric surgery candidates and to identify psychological factors associated with obesity in a Mexican public hospital. As a high prevalence of psychopathology has been described in obese patients, the relationship between obesity level and psychopathology has not been described, therefore the aim of the present study.

## METHODS

### *Participants and Design*

This is a cross sectional descriptive correlational study. All bariatric surgery candidates from the Obesity Clinic at *Dr. Manuel Gea González General Hospital* (México City, México), who sought for care for the first time between March and November 2010, were studied. Evaluations were made individually at the Obesity Clinic's installations to 129 patients, 16 were eliminated because questionnaires were incomplete, therefore 113 patients were included. Study was approved by hospital's Ethics Committee and patient's confidentiality was respected.

### *Instruments*

The following instruments were applied by the same clinical psychologist:

*Beck Depression Inventory*. Adapted for Mexican population (Jurado, Villegas, Méndez, Rodríguez, Loperena, & Varela, 1998) which is a 21-item self-report instrument intended to assess the existence and severity of depression symptoms and has been used in obese patients (Hayden *et al.*, 2010).

*Anxiety Sensitivity Inventory* (Zvolensky, Arrindell, Taylor *et al.*, 2003). An 18-item self report instrument that assesses concerns about negative consequences of anxiety symptoms.

*Health Related Quality of Life Inventory* (Riveros Rosas, Sánchez Sosa, & Del Águila, 2009). A self report instrument that evaluates quality of life in different aspects, concerns, physical performance, isolation, body perception, cognitive functions, attitude towards treatment, free time, family, social network, relationship with physician and dependence to physician.

*Stress Control Perception in Mexican* (adapted version by Rojas, 2001). A 10 item self report instrument that assesses stress based on control perception.

*Risk Factors Related to Eating Disorders* (Gómez & Pérez-Mitre, 2000). A 31 item self report instrument, developed for Mexican population, assesses 3 factors, compulsive eating behavior, dietary and restraint behavior and concerns about body and weight.

*MINI International Neuropsychiatric Interview* (Sheehan & Lecrubier, 2000). A semi-structured interview to assess psychopathology according to DSM IV.

### *Statistical analyses*

Sociodemographic profile, anthropometric measures (weight, height, BMI, waist circumference, hip circumference, waist to hip ratio) and psychological evaluation results were analyzed with descriptive statistics. Patients were divided into groups according to BMI and obesity level (II-IV, WHO classification), regression analysis was performed to analyze psychological factors associated with different levels of obesity.

## RESULTS

Sociodemographic and anthropometric measures as well as psychological evaluation results were analyzed with descriptive statistics. Of the 113 patients included in statistical analysis, 19.4% ( $n=22$ ) were men and 80.6% ( $n=91$ ) women, the mean age was 36.9 years with range from 17 to 59 years; in what respects to social status, 38% ( $n=43$ ) of the patients were single, 35.3% ( $n=40$ ) married, 3.5% ( $n=4$ ) lived as common law marriage, 4.4% ( $n=5$ ) were separated/divorced and only .88% ( $n=1$ ) widow, 17.6% ( $n=20$ ) remain unknown/missing. The education level was as follows: .88% ( $n=1$ ) elementary school, 12.38% ( $n=14$ ) finished junior high school, 7.07% ( $n=8$ ) had a technical career, 21.23% ( $n=24$ ) attended high school, 34.5% ( $n=39$ ) college and 8.84% ( $n=10$ ) attended post-graduate school, 15% ( $n=17$ ) remain unknown (Table 1).

Results of MINI International Neuropsychiatric Interview shown a prevalence of psychopathology of 36.3% ( $n=41$ ) of the patients fulfilling diagnostic criteria for at least one of the disorders evaluated by the interview; 21.23% ( $n=24$ ) fulfilled diagnostic criteria for one psychiatric disorder; 9.7% ( $n=11$ ) fulfilled diagnostic criteria for two psychiatric disorders; 4.4% ( $n=5$ ) for three psychiatric disorders; and .88% ( $n=1$ ) for five disorders; 63.7% ( $n=72$ ) didn't fulfill diagnostic criteria for psychiatric disorders as evaluated by MINI International Neuropsychiatric Interview.

*Table 1.* Sociodemographic Information and anthropometric measures ( $N=113$ ).

Variable	Mean	Range	SD
Age	36.9 years	17-59 years	10.23
Weight (kg)	122.35 kg	84.5-274 kg	28.45
Height (m)	1.63 m	1.45-1.82 m	21.99
BMI (kg/m <sup>2</sup> )	45.53 kg/m <sup>2</sup>	34-92.6 kg/m <sup>2</sup>	9.20
Waist Circumference (cm)	121.87cm	92.5-190 cm	17.48
Hip Circumference (cm)	137.69 cm	104-207 cm	19.41
Waist-Hip Ratio	.88	.71-1.1	.11

Regarding psychiatric disorders most common was Generalized Anxiety Disorder with 21.53% ( $n= 14$ ), followed with Mayor Depressive Disorder and Disthmic Disorder with 18.4% ( $n= 12$ ) each; dependence/abuse of alcohol 9.2% ( $n= 6$ ); binge eating disorder in 7.69% ( $n= 5$ ); panic disorders and social phobia with 6.15 %( $n= 4$ ) each; suicidal risk and post traumatic stress disorder with 4.61% ( $n= 3$ ); and agoraphobia in 3.07% ( $n= 2$ ). None of the patients fulfilled diagnostic criteria for maniac/hipomaniac episode, obsessive compulsive disorder, dependance/abuse of substances, psychotic episodes, anorexia or bulimia. Global results of Psychological Evaluation showed a mean of 12 on Beck Depression Inventory (BDI) (Jurado *et al.*, 1998); this means mild levels of depression; 57.52% ( $n= 65$ ) of the patients scored for any level of depression having 37.2% ( $n= 42$ ) mild depression, 18.6% ( $n= 21$ ) moderate depression and 1.8% ( $n= 2$ ) severe depression.

Anxiety sensitivity levels from the Anxiety Sensitivity Inventory (ASI) (Zvolensky, *et al.*, 2003) were also mild, the mean score was 12.6 with mayor physic concerns; 76.1% ( $n= 86$ ) of the patients presented any level of anxiety sensitivity having 34.5 ( $n= 39$ ) mild anxiety sensitivity, 31% ( $n= 35$ ) moderate anxiety sensitivity, 10.6% ( $n= 12$ ) severe anxiety sensitivity.

Stress Control Perception (PCE) (Rojas, 2001) had a general mean of 16, moderate levels of stress, 66.37% ( $n= 75$ ) of patients met criteria for any level of stress having 61.9% ( $n= 70$ ) moderate levels of stress and 4.4% ( $n= 5$ ) severe levels of stress.

Health related Quality of Life measured with Health Related Quality of Life Inventory (InCaViSa) (Riveros Rosas *et al.*, 2009) areas that showed to be mostly affected were body perception, physical development, doctor-patient relationship, dependence to doctor, free time and general concerns.

Study population was divided in groups according to obesity level following WHO classification; obesity level II ( $n= 30$ ), level III ( $n= 57$ ), level IV ( $n= 26$ ).

Psychological and sociodemographic variables were analyzed with one-way ANOVA in order to seek the effect they have on BMI. Variables showing significant differences between them were physical development ( $F 3.508, p= .033$ ), perception of family support ( $F 7.784, p= .001$ ) and concerns about weight and food ( $F 3.712, p= .028$ ). No other variables showed significant differences between levels of obesity.

Multiple comparissons were made between obesity level groups and the variables that had shown significant differences in ANOVA. Physical Development was compared according to obesity level groups, significant differences were found between group of obesity level II and IV ( $p= .035$ ). The group with mayor level of obesity showed significant higher affection at physical development (Figure 1).

Table 2. Significant differences according to obesity level group

Variable	Level II (BMI 35-39.9)	Level III (BMI 40-49.9)	Level IV (BMI $\geq$ 50)	<i>p</i>
Physical Development	6.60	8.42	9.90	.033
Family	3.60	1.90	.70	.001
Concerns about food and weight	.23	.07	.03	.028

Perception of familiar support also showed significant differences ( $p= .001$ ) between groups of obesity level II with groups III and IV but not between groups III and IV. Groups with lower BMI (obesity level II) reported significant less perception of family support than groups with higher BMI (levels of obesity III and IV) (Figure 2).

Concerns about food and weight showed significant differences ( $p= .028$ ) too. Group with lower BMI (obesity level II) had significant higher concerns about food and weight than groups with higher BMI (obesity levels III and IV), no differences were found between groups of obesity level III and IV (Figure 3).



Figure 1. Comparison of score at physical development affection according to obesity group ( $p= .033$ ).

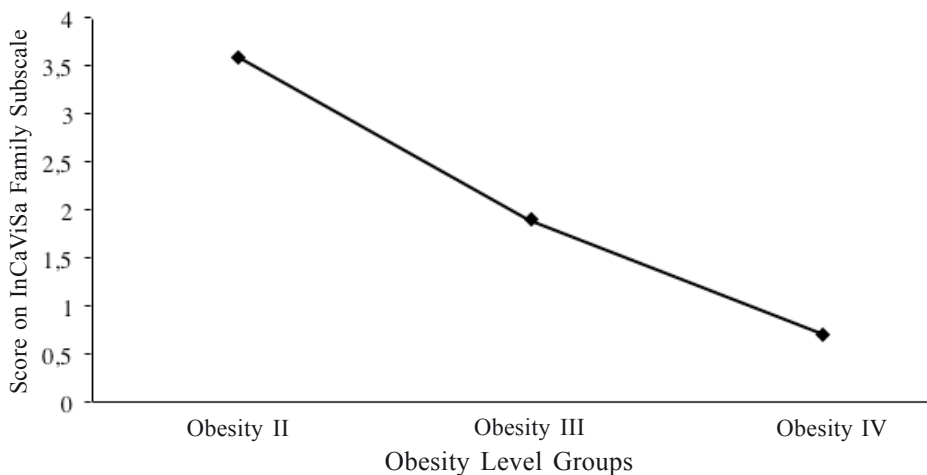


Figure 2. Negative perception of family support according to obesity level group (at higher the score, means less support percieve;  $p= .001$ ).

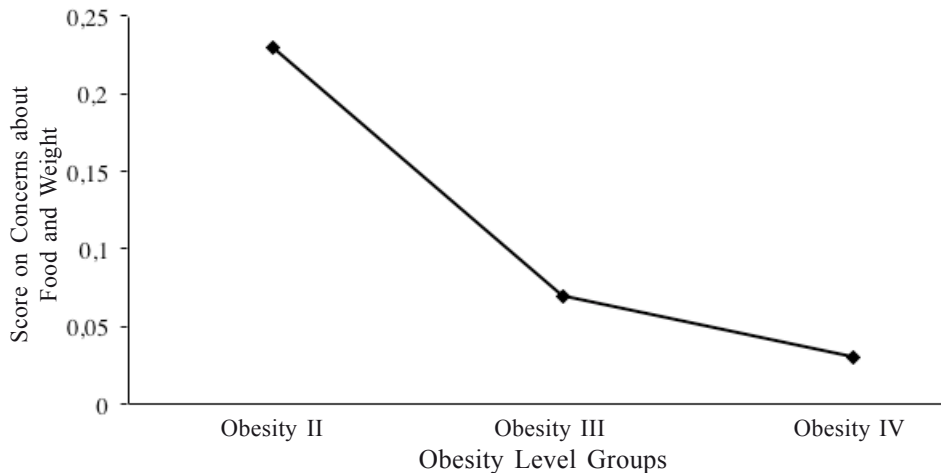


Figure 3. Concerns about food and weight according to obesity level groups.

## DISCUSSION

Obesity is a health problem not only related to physical risks, but also to a great variety of psychological symptoms (Feldman *et al.*, 2008; Hayden *et al.*, 2010; Kalarchian *et al.*, 2007; Kessler *et al.*, 2005; Luppino *et al.*, 2010; Magallares *et al.*, 2011; Petri *et al.*, 2008; WHO, 2006). Present study results showed 36.3% of the participants meeting at least one of the psychopathology diagnosis evaluated by MINI, most frequently generalized anxiety disorder, dysthymic disorder and mayor depressive disorder; these results match up with previous research (Hayden *et al.*, 2010; Kalarchian *et al.*, 2007; Kessler *et al.*, 2005; Luppino *et al.*, 2010) who found a strong relationship between obesity and depression, they also match up another study found higher prevalence of mood and personality disorders in obese (Kalarchian *et al.*, 2007; Petri *et al.*, 2008) and with Kessler *et al.* (2005) and Abilés *et al.* (2010) who concluded that patients seeking for bariatric surgery have higher prevalence of psychiatric disorders; he also concluded that at greater level of obesity, higher prevalence of psychiatric disorders. In the present study, level of obesity was not related with psychopathology prevalence.

Another reported consequence of obesity is physical concerns (Werrij *et al.*, 2009); our results show significant higher concerns about food and weight in the group with less obesity level (level II) than in groups with obesity level III and IV. It seems like patients with larger BMI lose hope to resolving weight problem so concerns about food and weight diminish; this relationship could be related to previous attempts on losing weight and should be studied. These concerns are necessary to generate a lifestyle change (Daddario, 2007); if a patient presents physical concerns as well as concerns about food and weight, it would be more probable for him/her to decrease weight and to improve physical health; this would impact on a better therapeutic adherence and increase post operative success.

One more factor that has proven to have impact on a patient's lifestyle change are support networks, specially family relationships; a family can help or sabotage a patient's try to change lifestyle particularly alimentary behavior (Bauchowitz *et al.*, 2005). Our research team found that at greater levels of obesity, higher perception of family support was present; this could be related to concerns about weight and food. The group of patients with higher scores on concerns about weight and food presented less perception of family support, it seems like food concerns could generate family conflicts, specially in mexican population where demonstrations of affect are made through food, and social and familiar reunions center around food. It would be important to investigate more about this relationship in order to design pertinent interventions to help patients to change lifestyle without generating conflict with family.

On what respects to physical development, at larger BMI, major physical limitation was found; the latter is important because it directly impacts patient's quality of life which interferes with lifestyle changes because of the difficulty of making physical activity, some daily activities that require patient's active participation such as jobs, social reunions, recreational activities cannot be realized and it also impacts emotional aspects.

As a conclusion, obesity is a disease that brings not only physical but also psychological consequences, it impacts on patient's quality of life and this makes treatment more difficult. A multidisciplinary treatment for obesity and bariatric surgery is essential to make treatment success. Mental health professional should identify factors that could interfere in lifestyle modification and design interventions to change them.

In Mexican patients, it seems like food plays an important role in demonstrating family affect, it has been described that the act of eating carries out as well as nutritional functions, a sense of community of what is close and familiar; eating involves confidence and proximity with whom food is shared (Ramírez Vidal, 2005). If this relationship is not assessed and treated appropriately it could generate family conflicts and impact patient's integral wellbeing and adherence to nutritional regimens.

We suggest more research about this relationship and to design interventions for bariatric surgery patients that involve family members, psychoeducation about the need of lifestyle changes in bariatric patients and the importance of family role, teaching different ways to demonstrate affect than food and social skills for the patient to deal with family pressure.

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