Anxiety and Social Anxiety Symptoms among Overweight Females Seeking Treatment for Obesity

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ABSTRACT

Introduction: Obesity has become an epidemic problem worldwide. In the Egyptian community the status of overweight has reached an alarming level. About one out of four cases of obesity is associated with a mood or anxiety disorder, but the causal relationship and complex interplay between both problems is still unclear**.**

Aim of the study: To determine the prevalence of anxiety and social anxiety symptoms among the female subjects seeking treatment for obesity; and to examine the correlation of anxiety and social anxiety symptoms with age, multiparity, duration of obesity, Body Mass Index (BMI) and Binge Eating (BE).

Subjects and methods: A cross-sectional study based on self-reporting used to screen 93 Arab females who are seeking treatment at the obesity clinic. The assessment tools included: Questionnaire on Eating and Weight Patterns-Revised (QEWP-R), Beck Anxiety Inventory (BAI), and Brief Social Phobia Scale (BSPS).

Results: This study revealed BMI to be (37.140±8.0573). Binge eaters constituted 68.8% of the sample with a highly significant relationship between binge eating and anxiety symptoms. A comparison between social anxiety symptoms among obese subjects and subjects having morbid obesity showed high statistically significant difference. Correlation of the social anxiety symptoms with the duration since last pregnancy and the duration of obesity was significant.

Conclusion: The prevalence of social anxiety symptoms among overweight females seeking treatment for obesity is relatively high.

Key words: Obesity; Overweight females; Binge eating; Anxiety; Social anxiety symptoms.

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INTRODUCTION

Obesity has reached epidemic proportions globally; with more than one billion overweight adults (at least 300 million of them are clinically obese). Obesity has become a major contributor to the global burden of chronic disease and disability. Often coexisting in developing countries with under-nutrition, obesity is a complex condition, with serious social and psychological dimensions, affecting virtually all ages and socioeconomic groups[1].

Obesity has become an epidemic problem worldwide, and in the Eastern Mediterranean Region the status of overweight has reached an alarming level. In adulthood, women showed a higher prevalence of obesity (35%–75%) than men (30%–60%). Several factors, such as change in dietary habits, socioeconomic factors, inactivity and multiparity (among women) determine obesity in this Region[2]. In an Egyptian study, the age-adjusted prevalence of central obesity among adults was 24.1% and 28.7% based on the waist circumference and waist to hip ratio indicators, respectively[3].

Obesity is hypothesized to be a risk factor for anxiety disorders. Cross-sectional evidence suggested a positive association between obesity and anxiety, but the evidence supporting a longitudinal association between these two conditions is not clear (4).

The prevalence of overweight and obesity is commonly assessed by using Body Mass Index (BMI), defined as the weight in kilograms divided by the square of the height in meters (kg/m²). A BMI over 25kg/m2 is defined as overweight, while over 30 kg/m² is defined as obese. These markers provide common benchmarks

for assessment, but the risks of disease in all populations can increase progressively from lower BMI levels[1].

Since the prevalence of morbid obesity (BMI≥40kg/m²) has been estimated to be 0.4% and 0.2% in men and 2.2% and 1.2% in women in the US[5] and German[6] population, respectively, it is evident that in-depth psychopathological evaluations of morbidly obese individuals are extremely difficult to perform on a population based level[7].

Several studies have assessed rates of psychiatric disorders among obese adults who were presenting for weight loss. Clinical studies using diagnostic interviews have generally found obese individuals to demonstrate high levels of psychopathology, particularly affective disorders, in comparison to non-obese controls[8, 9, 10]. Results of an NIMH-funded study showed that nearly one out of four cases of obesity is associated with a mood or anxiety disorder, but the causal relationship and complex interplay between the two is still unclear[11].

Stronger associations were observed between anxiety disorders and obesity than between mood disorders and obesity. These findings are interpreted in light of a research on the role of anxiety in eating pathology, and deserve further attention of researchers and clinicians. [12, 13].

Hypothesis:

This study is based on the hypothesis that overweight females seeking treatment for obesity are suffering from anxiety and/or social anxiety symptoms and that overweight and anxiety symptoms are associated with binge eating disorder.

DESIGN AND METHODS

This is a cross-sectional study. Data were collected from female subjects seeking treatment for obesity at the Outpatient Clinic of "Dr. Fakhry and Al-Rajhi" Private Hospital in Al-khobar city, Saudi Arabia. Only female subjects were included to preserve the homogeneity of the sample and to avoid the confounding effects of gender differences, also female visitors of the obesity clinic outnumber male visitors, which hinders a study with a comparative design.

Operational definitions:

Normal body weight is defined as a BMI in the range of 18.5–24.9; BMI is computed as a body weight in Kg divided by the square of height in meters. Overweight is defined as a BMI in the range of 25-29.9. A BMI of ≥30.0 is defined as obesity, while morbid obesity is defined as BMI ≥40kg/m² [14].

Obesity is a complex, multifactorial chronic disease, involving environmental (social and cultural), genetic, physiologic, metabolic, behavioral and psychological components[15].

The data were collected during a 6 months period since beginning of December 2007 to the end of May 2008. A verbal consent was obtained from each participant, after they were informed about the tools used in the study. Out of 158 female subjects who sought treatment at the obesity clinic during the period of the study, 93 ladies (87 Egyptians, 6 Saudi) has accepted to participate. Subjects with known history of neuropsychiatric conditions affecting cognition and cooperation were excluded: these were dementia (7 cases), cerebro-vascular stroke (4 cases), epilepsy (4 cases), psychotic disorders (5 cases), illiterate females (6 cases) and 39 females who refused to participate in the study.

Procedures:

The 93 ladies who constituted the sample of the study underwent medical examination. Their weights and heights were measured and BMIs were calculated. Scales were presented by the authors individually to each of the subjects and they were asked to answer all the questions.

All participants completed the following:

1. *The Questionnaire on Eating and Weight Patterns-Revised (QEWP-R) (16):*

This is a self-administered 28-item questionnaire used as a screening instrument. It is designed to assist in the identification and diagnosis of individuals with binge eating disorder, consistent with the provisional DSM-IV diagnostic criteria. The subjects spent 5-15 minutes to complete this questionnaire.

The first 9 questions of the QEWP-R assess demographic information. Items 10-15 assess overeating behavior to determine whether the respondent regularly engages in binge eating. Once it is established that an individual engages in binge eating episodes (that include an unusually large amount of food accompanied with loss of control), behavioral frequency and distress symptoms are assessed. Questions 16-23 assess concerns about weight and shape and compensatory behavior

2. *Beck Anxiety Inventory (BAI) (17):*

It is a 21-item self-report questionnaire, which assesses anxiety focusing on the somatic symptoms. Patients record how much they have been bothered by each symptom during the past week, including the day the

questionnaire was administered. It took approximately 5 minutes to complete.

The BAI is a reliable and well-validated measure of somatic anxiety symptoms. It is a short, self-administered scale which is simply scored. Each item is rated on a 4-point Likert scale. Because it is easy to administer and because data on non clinical individuals are available, the BAI may be a useful screening tool for individuals in a general medical setting.

It is important to note that the BAI does not assess worry, difficulty concentrating, irritability, or sleep disturbance. Therefore, it cannot be considered a specific measure for generalized anxiety disorder.

3. *Brief Social Phobia Scale (BSPS) (18):*

It is a semistructured interview for the assessment of the severity and treatment response in social phobia as defined by DSM criteria. It consists of 11 items: the first 7 items require respondents to provide separate ratings for the severity of fear and the severity of avoidance for some social situations. The second part includes 4 items that assess physiological symptoms experienced while being confronted with or while anticipating social situations.

The severity of each item is rated for the previous week on a 5-point Likert scale. Individual item scores are summed to yield three subscale scores (Fear, Avoidance, Physiological symptoms) and one total score. Average time for completing the interview was approximately 10-15 minutes.

Statistical Analysis:

Quantitative data e.g. age are presented as mean±standard deviation. Mann-Whitney U test was used to compare such data between two groups and Kruskal Wallis Test was used when more than two groups are to be compared.

Pearson correlation test (r) was used whenever a linear relationship between two quantitative data was to be tested. An (r) of 1.0 indicates that all the plotted points lie on a straight line and that the dependent variable can be predicted from the independent variable with 100%.

The Statistical Package for the Social Sciences (SPSS) program, version 11.01 was used $p< 0.05$ was considered statistically significant.

RESULTS

Descriptive data:

Table (1) shows the descriptive data of the studied sample.

Binge eating Disorder:

As regard the results of QEWP-R: the subjects who exerted binge eating constituted 68.8% of the sample (Table 4). Binge eating showed a highly significant relationship with anxiety symptoms measured by BAI, but no significant relationship has been found with social anxiety symptoms measured by BSPS (Tables 2, 3, 5).

Comparison between obesity and morbid obesity:

A comparison between obese subjects (BMI 25-40) and subjects having morbid obesity (BMI>40) as regards social anxiety symptoms measured by BSPS and anxiety symptoms measured by BAI is shown in Table 6

Correlations:

Correlation of age to weight and BMI revealed no significant relationship. Also, correlation of the number of pregnancies to BMI showed no significant relationship, while correlation of the duration since the last pregnancy to BMI showed a significant negative relationship.

The severity of anxiety symptoms was correlated to the subjects' age, maximum weight, BMI, duration of obesity (in years) and duration since last pregnancy. All the variables were positively correlated to the severity of anxiety in a high statistically significant pattern (Table 7). Correlation of social anxiety symptoms with duration since last pregnancy and duration of obesity showed significant results. (Table 8)

Table 1: Descriptive data of the sample

	N	Minimum	Maximum	Mean	Std. Deviation
Age		18	54	36.16	8.858
No. of sibs		0	13	5.15	2.545
No.of pregnancies		0	6	2.38	1.687
Duration since last preg		0	300	60.81	70.333
Height	93	148	179	159.59	6.388
Current weight		64	135	92.56	19.727
Max weight ever achieved by the patient		65	135	96.40	19.703
BMI		24.8	58.4	37.140	8.0573
Duration of obesity (years)		1	30	10.7156	8.61844

Table 2: QEWP-R question about the occurrence of overeating attacks

	Q.10	N	Mean Rank	Sum of Ranks	Mann-Whitney	P
BAI.TOTAL	+ ve binge eating	62	53.33	3306.50	U = 568.500	0.001
	- ve	31	34.34	1064.50		
BSPS.TOTAL	+ ve binge eating	62	47.44	2941.50	U =933.500	0.822
	- ve	31	46.11	1429.50		

Table 3: QEWP-R question about the loss of control during overeating attacks

	Q.11	N	Mean Rank	Sum of Ranks	Mann-Whitney	P
BAI.TOTAL	+ ve binge eating	57	53.94	3074.50	U =630.500	0.002
	- ve	36	36.01	1296.50		
BSPS.TOTAL	+ ve binge eating	57	48.39	2758.50	U =946.500	0.530
	- ve	36	44.79	1612.50		

Table 4: QEWP-R question about the distress due to overeating attacks

	Q 15	N	Mean Rank	Sum of Ranks	Mann-Whitney	P
BAI.TOTAL	+ ve binge eating	64	49.16	3146.00	U =790.000	0.252
	- ve	29	42.24	1225.00		
BSPS.TOTAL	+ ve binge eating	64	43.95	2813.00	U =733.000	0.105
	- ve	29	53.72	1558.00		

Table 5: QEWP-R question about the distress due to loss of control and inability to stop overeating attacks

	Q.16	N	Mean Rank	Sum of Ranks	Mann-Whitney	P
BAI.TOTAL	+ ve binge eating	42	58.11	2440.50	U = 604.500	0.000
	- ve	51	37.85	1930.50		
BSPS.TOTAL	+ ve binge eating	42	46.21	1941.00	U =1038.000	0.798
	- ve	51	47.65	2430.00		

Table 6: Anxiety and social anxiety symptoms in obese and morbidly obese subjects

	BMI.1	N	Mean Rank	Sum of Ranks	Mann-Whitney	P
BAI TOTAL	Obese	69	47.69	3290.50	U=780.5	0.676
	morbid obese	24	45.02	1080.50		
BSPS TOTAL	Obese	69	52.39	3615.00	U=456	0.001
	morbid obese	24	31.50	756.00		

Table 7: Correlation of anxiety symptoms to age, number of pregnancies, time since last pregnancy, maximum weight, BMI, and duration of obesity.

	BAI	N	Mean Rank	Kruskal Wallis Test	P
Age	normal or no anxiety	39	54.38	$Chi^2 = 22.327$	0.000
	mild to moderate anxiety	30	29.30		
	Moderate to severe anxiety	9	69.50		
	Severe anxiety	15	49.70		
No.of pregnancies	normal or no anxiety	39	49.23	$Chi^2 = 5.138$	0.162
	mild to moderate anxiety	30	38.55		
	Moderate to severe anxiety	9	56.17		
	Severe anxiety	15	52.60		
Duration since last pregnancy (in months)	normal or no anxiety	39	53.05	$Chi^2 = 34.161$	0.000
	mild to moderate anxiety	30	24.55		
	Moderate to severe anxiety	9	67.00		
	Severe anxiety	15	64.17		
Max weight	normal or no anxiety	39	43.00	$Chi^2 = 16.906$	0.001
	mild to moderate anxiety	30	53.50		
	Moderate to severe anxiety	9	72.17		
	Severe anxiety	15	29.30		
BMI	normal or no anxiety	39	41.92	$Chi^2 = 15.920$	0.001
	mild to moderate anxiety	30	53.05		
	Moderate to severe anxiety	9	73.33		
	Severe anxiety	15	32.30		
Duration of obesity	normal or no anxiety	39	55.46	$Chi^2 = 27.7$	0.000
	mild to moderate anxiety	30	40.77		
	Moderate to severe anxiety	9	72.00		
	Severe anxiety	15	22.47		

Table 8: Correlation of social anxiety symptoms to age, number of pregnancies, time since last pregnancy, maximum weight, BMI, and duration of obesity

	BSPS	N	Mean Rank	Sum of Ranks	Mann-Whitney	P
No. of pregnancies	no social phobia	60	44.75	2685.00	U =855.000	0.267
	Social Phobia	33	51.09	1686.00		
time from last pregnancy	no social phobia	60	52.29	3137.50	U =672.500	0.010
	Social Phobia	33	37.38	1233.50		
max weight	no social phobia	60	50.53	3031.50	U =778.500	0.089
	Social Phobia	33	40.59	1339.50		
BMI	no social phobia	60	47.63	2857.50	U =952.500	0.763
	Social Phobia	33	45.86	1513.50		
Duration of obesity	no social phobia	60	52.24	3134.50	U =675.500	0.011
	Social Phobia	33	37.47	1236.50		
AGE	no social phobia	60	48.42	2905.50	U =904.500	0.49
	Social Phobia	33	44.41	1465.50		

DISCUSSION

Health care providers who treat obesity are undoubtedly aware of the high prevalence of anxiety and mood disturbances among their patients. Likewise, psychiatrists working with individuals having anxiety or mood disorders are aware that their patients often struggle with weight and eating problems. What both of these providers are seeing is the frequent comorbidity between obesity and affective disorders. We know that there is a high degree of comorbidity between mood-related problems (such as depression and anxiety), and obesity. This occurs, in part, because of strong associations between mood-related problems and dysregulated eating patterns, including overeating[19].

This study examined a sample of 93 female subjects seeking treatment at the obesity clinic. Their age ranged between 18-54 years old (36.16$\pm$8.858). Their BMI ranged between 24.8-58.4kg/m² (37.14$\pm$8.057). Correlation of age to weight and BMI revealed a non significant relationship.

The wide range of subjects' age suffering from overweight shades light on the extending nature of the problem of overweight and obesity in the Arab countries especially among females. These results are consonant with other Arabic researches[2, 3, 20, 21, 22].

Unlike Europe and North America, obesity in the Eastern Mediterranean Region is more prevalent in women of higher socioeconomic status. In Jordan, for example the prevalence of obesity was 56% in urban areas compared to 44% in rural areas. Similar trends were found in Egypt, Islamic Republic of Iran, Morocco, Oman, Tunisia and Turkey[2]. Lebanon was an exception as obesity was more prevalent among rural than urban women[2]. In general, obesity in this region was found to be more prevalent in people who were young (30-50 years), better educated, currently married, females, and in those who watched television more than 2 hours per day, consumed fresh fruit less than 3 times a week and owned cars[20, 24].

The majority of the our sample subjects (82.8%) were married with a mean of 2.38 pregnancies and a mean of 60.81 months elapsed since their last pregnancy Correlation of the number of pregnancies to BMI showed a non significant relationship, while correlation of the duration since the last pregnancy to BMI showed a significant relationship. the shorter the duration the higher was the BMI i.e. the more was the overweight of the subject. This may be due to the inability of some of the Arab females to regain their shapes after delivery by losing weight, while they become more acquainted to their shape and health problems as their children grow up.

As regard the results of QEWP-R: binge eaters constituted 68.8% of the sample showing a high significant relationship regarding their anxiety symptoms measured by BAI. On the other hand no significant relationship has been found between binge eating and social anxiety symptoms measured by BSPS.

The frequency of binge eating, and anxiety in severely obese patients seeking treatment for obesity was assessed revealing the frequency of binge eating (54%), anxiety trait (70%) and anxiety state (54%)[25]. Other studies established that obese individuals with binge eating disorder have considerably higher rates of axis I and II psychiatric disorders than obese controls[26-30].

In the current study, patients experiencing distress due to overeating did not experience anxiety symptoms or social anxiety symptoms. This result could not be explained in light of available literature , however it may be psychopathologically attributed to the substitution of anxiety symptoms not accepted by the subject and the society or by an accepted distress about

overeating which may be relieving the subject's subtle anxiety.

The link between weight and certain psychiatric disorders could point to a general "behavioral dysregulation," where people deal with stress by overeating, as well as doing other things in excess. Eating can also become a "conditioned reinforcer" in some people. This means that if a person habitually turns to food in response to anxiety, then eventually even minor stress may spur overeating[31].

A comparison between obese subjects (BMI 25-40) and subjects having morbid obesity (BMI>40) as regards BSPS scores showed high statistical significant difference. While comparison between both groups as regard BAI scores showed no significant differences. These results may be attributed to poor body image satisfaction and low self esteem associating morbid obesity. The social anxiety symptoms showed significant correlation to the duration of obesity and the duration since last pregnancy. The inability of the obese patient to lose weight and regain the ideal shape may increase the anxiety symptoms.

There is a significant correlation between low body image satisfaction and anxiety[32]. High levels of body image dissatisfaction were also associated with high levels of anxiety and negative affect particularly among females. The body dissatisfaction was not only moderated by cognitive rational evaluations of one's body size, but also included a significant affective component[33]. Prominent cognitive processes are involved in the internalization of the slender beauty ideal, development of beliefs that constitute a thinness schema and a tendency to compare one's weight and shape to the bodies of various other people, such as peers and celebrities (34).

There was a highly significant statistical relationship between the severity of anxiety symptoms and age, duration since last pregnancy and duration of obesity. Anxiety symptoms were also significantly correlated to BMI and to the maximum weight achieved by the patient. These results assure that patients are suffering more from anxiety symptoms with the increasing severity and duration of overweight or obesity. Further studies are needed to assess anxiety before and after weight loss, among obese patients who succeed to lose weight.

Behavioral, biological or genetic factors could all plausibly play a role in the relationship between weight and mental health. The causal relationship between obesity and anxiety disorders continues to be debated and studied. Both likely contribute to the other, but they may be linked through common environmental or biological factors as well[11].

Though some efforts have been made to determine direction of causality for these associations (which is probably bidirectional), definitive answers may be less useful to providers than working to understand the underlying core processes or functional mechanisms that may serve to maintain both issues (35).

LIMITATIONS

A more comprehensive study would take a well matched control group from non obese females having anxiety, and compare them to the subjects of the study. Also, further assessment of subjects in follow up visits would give more information about the persistence of anxiety symptoms or their disappearance after weight loss. Whether the subjects were able to lose weight or not would be correlated to the presence of anxiety and social anxiety symptoms.

CONCLUSION

The prevalence of anxiety and social anxiety symptoms among overweight and obese females seeking treatment for obesity is becoming relatively high and is probably increasing in severity as the time elapses. Binge eaters showed higher anxiety symptoms, while morbid obesity was more associated with social anxiety symptoms. However, more research is needed to identify the direction of causality between obesity and anxiety. Indeed, this common association deserves to be considered in the management plan of both problems (Anxiety and Obesity).

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الملخص العربي

منن ربيع- نهلة فوزى-مرفت صلاح الدين

زاد انتشار السمنة المفرطة مؤخرا في مختلف أنحاء العالم زيادة واضحة, حتى أن عدد البالغين المصابين بالسمنة يقدر ببليون شخص في العالم. وتعد مشكلة السمنة من المشكلات المركبة التي تصيب مختلف الأعمار والمستويات الاجتماعية, كما أن لها أبعاد اجتماعية ونفسية خطيرة.

وتصل نسب الإصابة بالاكتئاب والقلق إلى ٢٥% في المرضى الذين يعانون من زيادة الوزن. ولكن العلاقة السببية لا تزال غامضة, فهل زيادة الوزن هي التي تسبب أعراض القلق والاكتئاب, أم أن القلق والاكتئاب يتسببان في تغيير العادات الغذائية ومعدلات النشاط فينتج عن ذلك حدوث السمنة؟

قامت هذه الدراسة بالبحث في بعض العادات الغذائية وأعراض القلق وأعراض القلق الاجتماعي في عينة من السيدات المترددات على إحدى عيادات السمنة. وكانت أعمارهم تتراوح ما بين ١٨ و٥٤ سنة, مما يشير إلى انتشار المشكلة في مختلف المراحل العمرية, واتفق ذلك مع عدد من الدراسات العربية في نفس المجال. وقد أظهرت بعض هذه الدراسات أن السمنة في معظم المجتمعات العربية تصيب السيدات اللاتي ينتمين للمستويات الاجتماعية الأعلى, بعكس النتائج في الدراسات الأوروبية المشابهة.

وكان ٨٢،٨% من السيدات المشاركات في الدراسة متزوجات, وكان متوسط عدد مرات الحمل ٢،٣٨%. وقد وجدنا علاقة إحصائية عكسية بين درجة السمنة والمدة التي مضت منذ آخر فترة حمل.

وقد أظهرت النتائج انتشار نوبات الأكل بشراهة بين السيدات اللاتي يعانين من أعراض القلق العام,بينما كانت أعراض القلق الاجتماعي أكثر ظهورا في السيدات اللاتي يعانين من سمنة مفرطة, قد زادت معدلات القلق مع زيادة فترة المعاناة من السمنة المفرطة.