



Prevalence of Eating disorders and its relation to Impulsivity among Overweight and Obese patients attending Obesity Outpatient Clinics

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Abstract

Background: Patients who suffer from obesity and overweight have a higher risk of both mental and physical illness. People with obesity, especially who seek treatment, are reported to have eating and other psychiatric disorders. On the other hand, psychological factors or personality characteristics can influence obesity treatment. To our knowledge, a few studies have investigated this relationship in Egypt. So we aimed to detect the prevalence of eating disorders among patients seeking treatment for obesity and to detect prevalence of impulsivity in obese and overweight patients with eating disorders (ED) compared to obese & overweight patients without ED.

Methods: This study was performed among patients seeking treatment for obesity either non-surgical treatment at the nutrition clinic or surgical treatment at bariatric surgery clinic. All subjects were assessed using Arabic versions of the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID I), Eating Attitude Test (EAT-40) and Barratt Impulsiveness Scale (BIS-11) and sociodemographic data collection.

Results: 592 subjects were recruited and divided according to BMI. Eating disorders (EDs) were prevalent among 55.1% (n = 326) of the studied sample with binge eating disorder (BED) being the most prevalent (72.7%). Bulimia nervosa (BN) was significantly higher in the overweight group compared to the obese group (80% vs 20%) while BED was significantly higher in the obese group (67.5 % vs 32.5%). BED was significantly associated with impulsivity as 86.5% of patients with BED had high impulsivity. A positive correlation found between BMI and age, EAT-40 and BIS-11 scores.

Conclusion: Eating disorders were prevalent among obese and overweight patients seeking treatment and associated with higher degrees of impulsivity.

Keywords: Eating disorders, impulsivity, Overweight, Obesity.

Introduction:

One of the biggest problems facing public health in the twenty-first century is obesity. Obesity is responsible for roughly 4.7 million premature deaths per year. It accounted for 8.4% of all fatalities globally in 2017 and was the fifth-leading cause of death that could have been prevented. Egypt has the world's 18th-highest rate

of obesity, according to the World Health Organization (WHO). The effects of associated comorbidities make the burden of obesity even more complicated [1]. People who are obese or overweight are more likely to develop chronic diseases such as hypertension, diabetes mellitus, cardiovascular disease, and stroke. It is also thought to be significant how obesity and mental

health are related [2].

Eating disorders (EDs) are serious illnesses that have significant psychological comorbidity and can have life-threatening medical implications. Anorexia nervosa, bulimia nervosa, binge eating disorders, rumination disorders, avoidant/restrictive eating disorders, and night-eating syndrome are all examples of EDs. In communities where there is a lot of concern about weight and appearance, these disorders are more prevalent. Researchers hypothesized that women's body image disturbance and the development of EDs are mostly caused by excessive exposure to Western mass media's portrayal of the thin-ideal body [3].

The prevalence of EDs in non-Western nations was lower but appeared to be rising when compared to its prevalence in Western nations. The influence of the media, along with swift societal change and the adoption of Western lifestyles, has a significant impact on how younger generations in many Arab countries have changed their beliefs and actions, leaning more toward Western values. Interest in the connection between eating disorders and obesity has always existed. Weight, food, and body image are key aspects of both situations, and societal and cultural factors are significant in both situations. In numerous etiological hypotheses, the two illnesses have been connected. There is currently limited research on the prevalence of EDs among Egyptians visiting weight-management facilities [4].

Mowafy et al. [3] showed that EDs are prevalent in 11% of the obese and overweight group. These findings somewhat corroborated to those from a Norwegian study on patients awaiting bariatric surgery, which revealed a greater prevalence (17.8%) of EDs [3].

The eating pattern that has been linked to obesity the most frequently is binge eating. According to community research, obese people are more likely than normal-weight adults to engage in binge eating, while the rate is still modest (less than 5%) [5].

Binge eating disorder (BED) patients exhibit an eating pattern defined by recurrent episodes during which they consume an unusually high amount of food in a brief length of time and feel a subjective loss of control over their eating habit. Many BED patients are overweight or obese because they don't routinely reduce their caloric consumption [6]. BED may be a phenotype within the obesity spectrum that is characterized by greater impulsivity due to the specific disinhibited eating behavior that BED patients exhibit [5]. It is recognized that impulsivity is a multifaceted personality trait with a solid neurological

foundation [7].

In the interim, there is data that suggests BED patients have more trait impulsivity than healthy, normal-weight people, and possibly even than people with a BMI that is similar to theirs. For instance, compared to controls with BMI-matched characteristics, BED patients in a recent large questionnaire research reported considerably more impulsive behaviors [8].

Additionally, contrary to other overeaters, several research has found that fat individuals were more impulsive. It might be harder for them to resist the lure of foods high in carbohydrates due to an increase in impulsivity [9]. Furthermore, impulsivity-related psychopathology, such as mood, substance use, and personality disorders, usually coexists with BED. Further research into the National Comorbidity Survey Replication data found that 43.3% of people with BED also had comorbid impulse control issues [10].

Research on the causes of and remedies for obesity must take a mental perspective. For effective treatment applications, it is essential to comprehend the psychopathology of obesity [11]. According to the aforementioned, the current investigation was necessary in order to examine the prevalence of eating disorders among obese and overweight patients and to determine how it related to impulsivity.

Subjects and Method

This cross-sectional study was conducted among patients seeking treatment for obesity either non-surgical treatment at the nutrition clinic or surgical treatment at the bariatric surgery clinic at Zagazig University hospitals, Sharqia, Egypt.

All patients with BMI ≥ 25 seeking treatment for obesity either surgically or non-surgically, of both genders, aged 18 years or above, from all socioeconomic classes and educational levels were included in the study. Severe untreated endocrinopathies affecting the etiological basis of obesity such as Cushing syndrome, PCO, hypothyroidism & GH deficiency were excluded from the study.

In a single session, all subjects included in the study were subjected to a semi-structured interview that was employed to obtain age, sex, education, occupation, place of residence, and marital status are all sociodemographic factors.

Psychometric and physical assessments included:

- **BMI:**

To determine each participant's BMI, weight and height measurements were made (BMI). BMI was calculated using the formula body weight (in kg) / body height (in m)². According to the World Health Organization Growth

Reference, overweight participants have a BMI between 25.0 and 29.9 kg/m², and obese participants have a BMI of 30.0 kg/m² or higher [12].

- **Structured Clinical Interview for DSM-IV Axis I Disorders (SCIDI) [13], Arabic version [14]:**

It is used to diagnose psychiatric disorders on axis I. This semi-structured diagnostic interview uses the DSM-IV. The section on demographic data and clinical background is the first in the document. The remaining seven diagnostic modules are centred on several diagnostic categories, including mood, eating, and adjustment disorders. Skip outs are subjected to mandatory and discretionary probes when no further questioning is necessary. It contains a functional scale global assessment. The duration of a normal administration is between 15 minutes to two hours, and it is employed in different types of psychiatric research as well as clinical trials where it is regarded the standard interview to diagnose patients. DSM-IV was used to diagnose EDs.

- **Eating Attitudes Test (EAT-40) [15], Arabic version [16]:**

EAT-40, created by Garner and Garfinkel, was employed to test the eating abnormalities. It is a 40-item multidimensional self-report scale created to evaluate the behaviors, attitudes, and characteristics connected to the EDs, particularly AN and BN. Responses are rated from 1 (always) to 6 (never). Items of 1, 18, 19, 23, and 39 are scored as: 3, 2, or 1 = 0 points; 4 = 1 point; 5 = 2 points; and 6 = 3 points. The remaining items are scored as: 4, 5, or 6 = 0 points; 3 = 1 point; 2 = 2 points; and 1 = 2 points. The scores for each item differ from one another. The total score is the sum of all items ranging from 0 to 120. A score >30 is regarded as a predictor of EDs.

- **The Barratt Impulsiveness Scale (BIS-11) [17, 18], Arabic version [19]:**

It is a self-administered questionnaire designed to assess the personality/behavioral construct of impulsiveness. It includes 30 items that yield six first-order factors (attention, motor, self-control, cognitive complexity, perseverance and cognitive instability impulsiveness) and three second-order factors (attentional, motor and non-planning impulsiveness). Items are summed, and total scores represent total levels of impulsivity. Scores range from 30 to 120, with higher scores indicating higher levels of impulsivity. Total

scores between 52 and 71 are within normal limits for impulsiveness while scores of 72 or above mean high impulsivity [18].

- **Ethical considerations**

This study was conducted according to the ethical guidelines outlined in the Declaration of Helsinki. Written informed consent was obtained from all participants before starting the study. This study was approved by the Institutional Review Board of Zagazig Faculty of Medicine (IRB No. 9561), and the committees of Psychiatry Department.

- **Statistical analysis**

All data were collected, tabulated and statistically analyzed using SPSS 26.0 for windows (SPSS Inc., Chicago, IL, USA).

Independent samples Student's t-test, Chi-square test, Fisher's exact test and person correlation coefficient were used.

RESULTS

This is a cross-sectional descriptive study performed on 592 overweight and obese patients, among them; 326 had EDs with BED being the most prevalent (72.7%). 80% of patients with BN were overweight while 67.5% of patients with BED were obese. (**Table 1**)

Most of our patients (72%) were married, and (28%) were either single or widow. Most of participants (95.3%) reached a university level of education. Regarding the employment status more than two thirds of the participants (86.1%) were working. Urban residents constituted 95.3% of the sample.

The mean age of the participants was 38.76±13.39 years ranging from 18 to 62 years. The mean BMI was 30.61±4.45 (kg/m²) ranging from 25 to 47.1 (kg/m²) and the participants were categorized according to BMI into overweight (46.5%) and obese (53.5%).

Regarding impulsivity; the mean BIS-11 scores were 66.67±12.69 and nearly two thirds of the cases (71.3%) had high impulsivity.

Half of the cases; total of 326 patients (55.1%) displayed an eating disorder. Participants with EDs were more likely to be married (53.7%), employed (53.1%), obese (63.7%) and had high impulsivity (83.1%). (**Table 2**)

Impulsivity was found to be higher among females, married, obese and highly educated participants. (**Table 3**)

BED and BN were significantly associated with impulsivity as 86% of BED and 63% of BN patients had high impulsivity. (Table 4)

scores and BIS-11 scores. There was statistically significant positive correlation between EAT-40 scores and BIS-11 scores. (Table 5)

There was statistically significant positive correlation between BMI and each of age, EA-40

Table (1): BMI and EDs among the studied group.

EDs	Weight groups				Chi-square test	P-value
	Overweight		Obese			
	N	%	N	%		
BN (n=30)	24	80	6	20	14.2	0.001*
BED (n=237)	77	32.4	160	67.5	30	0.001*
EDNOS (n=59)	24	40.7	35	59.3	0.87	0.348

EDs: Eating disorders, BN: Bulimia nervosa, BED: binge eating disorder, EDNOS: Eating disorder not otherwise specified.

Table (2): Socio-demographic characteristics of the studied groups with and without EDs (N=592).

Socio-demographic characteristics	EDs (n=326)		No EDs (n=266)		Chi-square test	P-value
	N	%	N	%		
Gender						
<i>Males</i>	28	50	28	50	0.642	0.423
<i>Females</i>	298	55.5	238	44.5		
Marital status					15.145	0.001*
<i>Single</i>	62	50	62	50		
<i>Married</i>	229	53.7	197	46.3		
<i>Widow</i>	35	83.3	7	16.7		
Educational level					0.305	0.581
<i>Middle</i>	14	50	14	50		
<i>High</i>	312	55.3	252	44.7		
Employment status					5.545	0.019*
<i>Employed</i>	271	53.1	239	46.9		
<i>Unemployed</i>	55	67	27	33		
Residence					0.305	0.581
<i>Urban</i>	312	55.3	252	44.7		
<i>Rural</i>	14	50	14	50		
Weight group					20.659	<0.001*
<i>Overweight</i>	124	45	151	55		
<i>Obese</i>	202	63.7	115	36.3		
Impulsivity					27.4	<0.001*
<i>Normal</i>	55	36.6	95	63.4		
<i>High</i>	271	61.3	171	38.7		

EDs: Eating disorders

Table (3): BIS-11 scores among the studied groups (N=592).

Socio-demographic characteristics	BIS-11 scores				Chi-square test	P value
	Normal		High			
	N	%	N	%		
Gender						
<i>Male</i>	0	0	56	100	53.2	<0.001*
<i>Females</i>	150	28	386	72		
Marital status					13.7	0.001*
<i>Single</i>	47	38	77	62		
<i>Married</i>	96	22.5	330	77.5		
<i>Widow</i>	7	16.7	35	83.3		
Educational level					9.44	0.002*
<i>Middle</i>	14	50	14	50		
<i>High</i>	136	24.2	428	75.8		
Employment status					2.89	0.088
<i>Employed</i>	123	24	387	76		
<i>Unemployed</i>	27	33	55	67		
Residence					0.284	0.593
<i>Urban</i>	143	25	421	75		
<i>Rural</i>	7	21	26	79		
Weight group					13.4	0.001*
<i>Overweight</i>	89	32	186	68		
<i>Obese</i>	61	19	256	81		

BIS-11: Barratt Impulsiveness Scale-11.

Table (4) Relation between impulsivity grades an each of EDNOS, Binge eating and Bulimia nervosa:

EDs	BIS-11 scores				Chi-test	P-value
	Normal		High			
	N	%	N	%		
BN (n=30)	11	37	19	63	6.3	0.01*
BED (n=237)	32	14	205	86	81.5	<0.001*
EDNOS (n=59)	12	20	47	80	0.081	0.775

EDs: Eating disorders, BIS-11: Barratt Impulsiveness Scale-11, BN: Bulimia nervosa, BED: binge eating disorder, EDNOS: Eating disorder not otherwise specified.

Table (5): Correlation between EAT-40, BMI, BIS-11 scores and age within the studied group

Variables		BMI	EAT-40 scores	BIS-11 scores
Age	R	0.118**	0.066	0.011
	P	0.004	0.110	0.796
BMI	R	1	0.258**	0.098
	P	-----	0.000	0.678
EAT-40 scores	R	0.258**	1	0.154**
	P	0.000	-----	0.000
BIS-11 scores	R	0.098*	0.154**	1
	P	0.018	0.000	-----

BMI: Body mass index, EAT-40: Eating Attitude Test-40, BIS-11: Barratt Impulsiveness Scale-11.

DISCUSSION

This cross-sectional study was conducted on 592 subjects to detect the prevalence of eating disorders and its relation to impulsivity among patients seeking treatment for obesity either non-surgical treatment at the nutrition clinic or surgical treatment at the bariatric surgery clinic at Zagazig University hospitals, Sharqia, Egypt.

Of the 592 overweight and obese patients, 90.5% were females. This is consistent with a Norwegian study where 157 obese participants were interviewed; of which 115 (73 %) were females and only 42 (26.8 %) were males [20]. According to Egypt demographic and health survey (EDHS) 2014, 85 percent of Egyptian women are overweight with 48 percent of that percentage suffering from obesity [21].

The present study indicates that 55.1 % were found to report symptoms consistent with an eating disorder compared to 11% in another Egyptian study by Mowafy et al. [3]. This could be due to different sample number in both studies. In our total sample; 40% reported a diagnosis of BED, 10% reported EDNOS, 5% reported BN while Mowafy et al. [3] found that 8% reported BED, 2% EDNOS and only 1% had bulimia nervosa. No one reported anorexia nervosa (AN) in both studies.

Regarding sociodemographics; our data revealed significant relationship between EDs and both marital and employment status as participants with EDs were more likely to be married (53.7%) and employed (53.1%). In contrast, literature showed that symptoms of EDs are distributed equally across levels of socioeconomic status in Egypt [3, 22] and internationally [23]. Data from previous research investigating the relation between education and EDs showed that EDs are not exclusive to certain educational level [24]. Other studies revealed the clear link between stress in general and of unemployment in particular and binge eating as an attempt to cope with financial and social stresses [25, 26].

This is in contrast to our results due to the large representation of married and educated subjects in our sample. Another explanation could be due to the great burden on our society to cope with the

ongoing challenges in our individual and national economic status on both individual, national or international levels irrespective of the sociodemographic status.

There was no statistically significant difference between males and females in the prevalence of eating disorders among each group which disagrees with Hudson et al. [27] who found that EDs were more common in girls than in males among obese individuals. The reason of the difference in results could be that females comprise the majority of our sample (90%).

Regarding the relation between EDs and BMI, this study found that 63.7% of the obese group had EDs. This agrees with an Egyptian study in Tanta that revealed an increased risk of eating disorders among study participants who are overweight/obese, compared to their colleagues who are normal/under weights, respectively ($p < 0.05$) [28]. However; Bittencourt et al. [29] claimed that there was no association between BED and BMI ($p = 0.341$).

The study's findings revealed that individuals who were overweight or obese were more likely to have BED (40 %) which is greatly higher compared to an American study that reported prevalence of BED to be 6% among obese and overweight patients [30]. Weight fluctuation is a common occurrence in people with ED, however binge eaters rarely have low body weight and typically have normal or higher-than-average weight since they don't utilize unhealthy compensatory behaviors like purging. Additionally, their disrupted abnormal relationship with food leads to particular meal rituals, which are typically focused on high energy preferences.

Another explanation could be that those with higher BMI exhibited a tendency to consume more energy, with a net predilection towards sweet and fatty food choices, compared to normal individuals [31].

Bulimia nervosa sufferers typically have BMIs in the normal or high normal range [32] or accompanied by decreased BMIs and a history of anorexia nervosa [33]. And that illustrates the

significant difference found in our study; as data indicated that BN is significantly higher in overweight group as it was found that 80% of the patients who suffered from BN were overweight patients.

The results indicated that there was statistically significant association regarding high impulsivity, marital status ($p=0.001$), educational level ($p=0.002$), female gender ($p<0.001$) and weight group ($p=0.001$). The significant relation between impulsivity and female gender differs with **Kuzmina et al. [34]** who found impulsivity more prominent in males. This could be demonstrated by the large presentation of females in our sample (90.5 %). College educated patients had higher mean impulsivity score than high school participants ($p<0.001$).

There is a paucity of research on the relationship between education and impulsivity in psychiatric samples. However, schooling was found to be negatively linked with the attention and non-planning impulsivity subscales of the BIS-11, but not with the motor impulsiveness subscale, in a sample of participants with bipolar disorder [35]. This difference may refer to the large representation of the highly educated subjects in this study sample.

In this study; married individuals were found to have high impulsivity compared to the unmarried (single or widow) group. The mean impulsivity score of widow patients is significantly higher than single and married participants ($p<0.001$). **Aiello et al. [36]** showed contradictory results as compared to single people, the group of people who were divorced, separated, or widowed exhibited increased motor impulsiveness. The married group did not substantially vary from the single, the divorced/separated/widowed group. Due to their impulsive behavior, which may have been accompanied by aggressiveness or poor functioning, persons with high impulsivity may have been more likely to experience a marriage's demise.

Eating disorders are significantly associated with impulsivity as it was found that **83.1%** of the patients who suffered from an eating disorder had

high impulsivity. This study demonstrated significant relation between BED and BN and the degree of impulsivity; as it was found that **86%** of the patients who suffered from BED and **63%** of those with BN had high impulsivity. This agrees with an American study which found that women who are emotionally impulsive report more severe binge eating. On the other hand, people who exhibit less behavioral impulsivity report less severe binge eating [37]. Another study found a substantial link between impulsivity and binge eating among US adolescents in a nationally representative sample [38]. Another Canadian study found that BN was higher when impulsivity was endorsed [39].

CONCLUSION:

Eating disorders are significant group of illnesses that have an impact on people's socio-emotional and physical wellbeing. Overweight and obesity are becoming more and more prevalent. Female participants were the majority representing (90.5%) while males (9.5%). Half of the cases; total of 326 patients (55.1%) displayed an eating disorder, 72.7% of them suffered from binge eating disorder in particular. Eating disorders and sociodemographic variables, such as marital status and employment position, differed statistically significantly. According to data, eating problems are substantially more common among the obese population as it was found that 62% of the patients who suffered from an eating disorder were obese. Binge eating disorder is significantly higher in obese patients as 67.5% of the patients who suffered from BED were obese. Bulimia nervosa is significantly higher in overweight group as 80% of the patients who suffered from BN were overweight. Associations were found between obesity, BED and impulsivity. Identifying individuals with BED as a special obesity subgroup can help to develop specific treatment programs to reduce impulsivity.

We recommend in current work proper health education through primary health care and media; for promoting of healthy diets, improving physical activity and increasing awareness about eating disorders and to seek professional help for early assessment and treatment. Early detection and

prevention of the development of overweight in normal weight individuals and prevention of progression of overweight to obesity through public health programs that deal with the societal and environmental factors that are conducive to reduced physical activity or increased energy intake.

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