Original Article

Prevalence and Associated Factors of Eating Disorders in Weight Management Centers in Tanta, Egypt

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Abstract

Background: Eating disorders (EDs) are serious illnesses associated with medical complications and have been increased, especially among societies with an excessive concern about weight, shape, or appearance. This study aimed to investigate the prevalence of EDs among the individuals attending weight management centers and its associated factors.

Methods: A cross-sectional study was carried out among individuals attending four weight management centers in Tanta, Gharbia Governorate, Egypt during the period from July to December 2016. Precoded interview questionnaires were used to identify the following data: sociodemographic characteristics and medical history of depression or psychological disorders and the Eating Attitude Test (EAT-40) was used to assess the attitudes, behavior, and traits associated with the EDs.

Results: A total of 400 participants (112 males and 288 females) were included in the study. According to EAT-40 questionnaires, the prevalence of positive and negative EDs was 65.0% (n = 260) and 35.0% (n = 140), respectively. EDs were more likely reported by females, married singles, rural residents, those with higher education, and nonworking or part-time working patients, those who were overweight or obese, and who were suffering from depression or any psychological problems. Logistic regression analysis revealed that the independent predictors of EDs were age (adjusted odds ratio [*OR*]: 1.06), nonworking (adjusted *OR*: 2.32) or part-time working (adjusted *OR*: 2.18), increased body weight (adjusted *OR*: 2.66 for overweight and adjusted *OR*: 1.24 for obese), and having a history of depression or any psychological problem (adjusted *OR*: 2.76). Factor analysis of EAT-40 revealed four factors (eating behavior, diet-related lifestyle, weight concern, and food preoccupation) that were responsible for 33.2% of the total variance.

Conclusions: EDs are prevalent among individuals attending the weight management centers in a northern city in Egypt. Specific management strategies are warranted to address this commonly prevalent disease.

Key words: Eating Disorders; Egypt; Weight Management Centers

Introduction

Eating disorders (EDs) are serious illnesses that are associated with severe medical complications and have significant psychiatric comorbidity that could be life threatening. EDs include anorexia nervosa (AN), bulimia nervosa (BN), binge EDs (BEDs), rumination disorders, avoidant/restrictive food intake disorders, and night-eating syndrome.[1,2] These disorders are more common in societies with excessive concern about appearance and weight.[3] EDs are more noticed in females and rarely in males. Since the second half of the 20th century, the icons of American beauty have become thinner and the media of Western societies have used the thin-ideal body as a standard of feminine beauty. In addition, women's magazines have published a variety of articles and reviews regarding the ways of weight loss. Researchers suggested that excessive exposure to Western mass media depicting the thin-ideal body is the main factor that causes body image disturbance among women and plays the main role in developing EDs.[4]

As compared to its prevalence in the Western countries, the prevalence of EDs in non-Western countries was lower but seemed to be increasing.[5] More recently, a systematic analysis of data collected from 25 different countries declared

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that symptoms of EDs were more pronounced in non-Western countries than that in Western countries in contrast to expectations.[6] However, ancient Arab culture considered plumpness as a symbol of fertility and womanhood.[7] The Egyptian society also prefers large female body sizes and regards plumpness as a sign of feminine beauty.[8] These concepts are thought to provide protection against EDs; however, influence of mass media together with rapid social changes and adoption of Western lifestyle in many of the Arab countries play an important role on changing the attitudes and behaviors of the younger generation in these countries with more swinging toward the Western values.[9] Till now, there are few studies regarding the prevalence of EDs among Egyptian individuals attending weight management centers. The current study was conducted to find out the prevalence of EDs among the patients attending weight management centers and to investigate the sociodemographic and the psychiatric correlates of EDs.

Methods

Ethical approval

The study was conducted in accordance with the *Declaration of Helsinki* and was approved by the Research Ethics Committee of the Faculty of Medicine, Mansoura University. Informed written consent was obtained from all participants prior to their enrollment in this study.

Participants

This cross-sectional study was carried out on adult individuals (≥18 years) who were attending weight management centers during the period from July to December, 2016.

Sample size was calculated online (www.dssresearch.com). A pilot study was conducted on twenty persons, whose mean total score of the Eating Attitude Test (EAT)-40 was found to be 47.3 ± 2.1, and by considering the worst expected as 49.3, the sample size was estimated to be 226 with 95% confidence interval and 80% study power. The study was carried out on 455 patients to give more chance for better assessments of the EDs and the response rate was 88%. The target group was selected randomly from four weight management centers in Tanta City, Gharbia Governorate. A systematic random sampling, one in every ten persons, was used for sample selection.

Measures and data management

All participants in this study were subjected to precoded interview questionnaires. The questionnaires were used to identify the following data: sociodemographic characteristics including name, gender, age, residence, occupation, education, and medical history of depression or psychological disorders. The EAT-40 developed by Garner and Garfinkel[10] was also used. It is a 40-item multidimensional self-report scale designed to assess the attitudes, behavior, and traits associated with 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 considered to be an indicator for EDs. All the participants were subjected to weight and height measurement in order to calculate their body mass index (BMI).

Statistical analysis

The completed questionnaires were reviewed and the collected data were coded, processed, and analyzed using SPSS version 16.0 (SPSS Inc., Chicago, IL, USA). Descriptive data were shown as frequencies and percentages. Chi-square test was used for analyzing the discrete and categorical data. Student's *t*-test was used to analyze the continuous variables. Logistic regression analysis was used to detect the predictor(s) of EDs. A $P < 0.05$ was considered statistically significant.

By doing a factor analysis of EAT-40, the value of Kaiser-Meyer-Olkin (a measure of the adequacy of the sampling) as 0.52 is considered acceptable in this study. Bartlett's test (assessing the appropriateness of the data for factor analysis and is another indication of the strength of the relationship among variables) showed $\chi^2 = 6680$ (df = 780, $P < 0.000$), which indicated the suitability of the data for factor analysis. Eigenvalues above 1.00 were used, and based on these criteria, four factors were identified. Factor loadings and screen plot were examined. Items were retained if their factor loading was at ≥0.30, which was similar to the study of Talwar.[11] The higher the absolute value of the loading, the more the item contributes to the factor. Internal consistency of the new factors was detected by Cronbach's alpha.

Results

A total of 400 participants with full data (112 males and 288 females) were included in the study; their mean age was 35.2 ± 11.6 years. Sixty-four (16.0%) of these participants were from rural areas and 336 (84.0%) from urban areas. Two hundred and ninety-two (73.0%) participants received a university or higher education and only eight (2.0%) received basic education. Most of the participants were self-employed or employed including part time (28.0%) and full time (43.0%), and 29.0% were nonworking. According to EAT-40 questionnaires, the mean score of EAT-40 was 45.2 ± 10.2 (25–66) and the prevalence of positive and negative EDs was 65.0% ($n = 260$) and 35.0% ($n = 140$), respectively.

As shown in Table 1, the group of positive EDs had older age (36.7 ± 12.5 years) than the group of negative EDs (32.5 ± 9.4 years, $P < 0.001$). EDs were more reported by females, married, those from the rural residence, with a higher level of education, nonworking or part-time working patients, those who were overweight or obese, and who were suffering from depression or any psychological problems (as reported by the patients).

Logistic regression revealed that the independent predictors of EDs were age (adjusted odds ratio [*OR*]: 1.06),

Table 1: Univariate and multivariate logistic regression analyses of the predictors for EDs according to EAT-40 in this study (n = 400)

Variables	Negative EDs (n = 140)	Positive EDs (n = 260)	P	Univariate logistic regression (crude *OR* [95% *CI*])	Multivariate logistic regression (adjusted *OR* [95% *CI*])
Age (years), mean ± SD	32.5 ± 9.4	36.7 ± 12.5	<0.001		1.06 (1.03–1.09)
Gender, *n*					
Male (reference)	44	68	0.158	1.29 (0.82–2.03)	
Female	96	192			
Marital status, *n*					
Single (reference)	60	76	0.004	1.82 (1.18–2.79)	
Married	80	184			
Residence, *n*					
Urban (reference)	124	212	0.044	1.75 (0.95–3.22)	
Rural	16	48			
Education, *n*					
Basic (reference)	4	4	0.023		
Secondary	24	76		3.17 (0.74–13.63)	
University or higher	112	180		1.61 (0.39–6.56)	
Occupation, *n*					
Full-time working (reference)	76	96	0.004		
Part-time working	32	80		1.98 (1.19–3.29)	2.18 (1.25–3.79)
Nonworking	32	84		2.08 (1.25–3.45)	2.32 (1.26–4.26)
BMI, *n*					
Normal (reference)	28	32	0.006		
Overweight	28	88		2.75 (1.42–5.33)	2.66 (1.31–5.41)
Obese	84	140		1.46 (0.82–2.59)	1.24 (0.67–2.28)
Depression or psychological problems, *n*					
Yes	112	244	<0.001	1.88 (1.27–2.8)	2.76 (1.35–5.66)
No	28	16			

BMI: Body mass index; *OR*: Odds ratio; *CI*: Confidence interval; SD: Standard deviation; EDs: Eating disorders; EAT-40: Eating Attitude Test-40.

nonworking (adjusted *OR*: 2.32) or part-time working (adjusted *OR*: 2.18), increased body weight (adjusted *OR*: 2.66 for overweight and adjusted *OR*: 1.24 for obese), and having a history of depression or any psychological problem (adjusted *OR*: 2.76).

Factor structure and reliability

Table 2 presents the results of the exploratory factor analysis of EAT-40. We found 4-factor solutions that were responsible for 33.2% of the total variance. The loadings of the items ranged from 0.300 to 0.720. Loading was mainly >0.400. The first subscale included the following items: anxious sensation before eating; feeling terrified about being overweight; eating binges; cutting the food into small pieces; being aware of the calorie content of the food staff; exercising strenuously to burn off calories; thinking of people's comments after getting too thin; avoiding sugary foods; eating low-caloric foods; feeling that food is controlling the life; self-control around or with food; engagement in dieting behavior; and enjoying trying new rich foods. These 13 items fixed under the first subscale that named "Eating behavior", which accounted for approximately 11.5% of the total variance. The reliability was $\alpha = 0.74$.

The second subscale included the following items: eating with other people; feeling preoccupied with food; vomiting after eating; waking up early in the morning; taking laxatives; giving much time and thought to food; and suffering from constipation. These 7 items fixed under the second subscale that named "Diet-related lifestyle", which accounted for approximately 7.5% of the total variance. The reliability was $\alpha = 0.59$.

The third subscale included the following items: avoiding eating when feeling hungry; avoiding food with a high carbohydrate content (i.e., bread, rice); feeling that others would prefer more eating; feeling extremely guilty after eating, desiring to be thinner; having regular menstrual periods; overthinking of having fat in the body; taking longer time than others to eat meals; enjoying to eat at restaurants; and having the impulse to vomit after meals. These 10 items fixed under the third subscale that named "Weight concern" that accounted for approximately 7.1% of the total variance. The reliability was $\alpha = 0.66$.

The fourth subscale included the following items: feeling bloated after meals; measuring weight several times a day; eating the same foods day after day; thinking about burning calories during exercise; feeling the pressure from others to eat more; feeling uncomfortable after eating sweets; and preferring stomach to be empty. The 7 items fixed under the fourth subscale that named "Food preoccupation" that

Table 2: Results of exploratory factor analysis of Eating Attitude Test-40

Items	Components			
	Eating behavior	Diet-related life style	Weight concern	Food preoccupation
Become anxious prior to eating	0.719			
Feel terrified about being overweight	0.713			
Feel that food controls my life	0.673			
Engage in dieting behavior	0.570			
Exercise strenuously to burn off calories	0.541			
Enjoy trying new rich foods	−0.519			
Eat diet foods	0.434			
Other people think that I am very thin	0.412			
Aware of the calorie content of foods that I eat	0.402			
Cut my food into small pieces	0.395			
Avoid foods with sugar in them	0.393			
Display self-control around food	0.342			
Have gone on eating binges where I feel that I may not be able to stop	0.332			
Wake up early in the morning		0.607		
Find myself preoccupied with food		0.578		
Suffer from constipation		0.525		
Vomit after I have eaten		0.477		
Take laxatives		0.425		
Give too much time and thought to food		0.417		
Like eating with other people		0.382		
Enjoy eating at restaurants			0.617	
Take more time than others to eat my meals			0.540	
Particularly avoid food with a high carbohydrate content (i.e., bread, rice)			0.534	
Feel that others would prefer if I ate more			0.476	
Feel preoccupied with a desire to be thinner			0.436	
Have regular menstrual periods			−0.408	
Have the impulse to vomit after meals			−0.354	
Avoid eating when I am hungry			0.334	
Feel extremely guilty after eating			0.304	
Am preoccupied with the thought of having fat on my body			−0.301	
Weigh myself several times a day				0.621
Feel that others pressure me to eat				0.608
Feel uncomfortable after eating sweets				0.536
Think about burning up calories when I exercise				0.526
Feel bloated after meals				0.516
Eat the same foods day after day				0.426
Like my stomach to be empty				0.317

accounted for approximately 7.1% of the total variance. The reliability was $\alpha = 0.64$.

Seventeen items showed good loading that ranged from 0.500 to 0.660 which were as follows: anxious sensation before eating; feeling terrified about being overweight; feeling preoccupied with food; avoiding food with a high carbohydrate content (i.e., bread, rice); feeling bloated after meals; exercising strenuously to burn off calories; measuring weight several times a day; waking up early in the morning; thinking about burning up calories during exercise; enjoying to eat at restaurants; taking longer time than others to eat meals; feeling that food controls the life; feeling the pressure from others to eat more; suffering from constipation; feeling uncomfortable after eating sweets; engagement in dieting behavior; and enjoying new rich foods. Three items, including preparing foods for others without eating what is cooked, preferring tightly fit clothes, and enjoying eating meat, were failed to load. The EAT-37 internal consistency was 0.776.

Discussion

EDs are a group of serious mental health problems characterized by a disturbance in eating behavior. They include BN, AN, and BEDs. EDs constitute a significant source of psychiatric morbidity and are an important public health concern. Knowledge about risk factors for EDs is crucial for early detection and implementation of preventive interventions.[11]

Most of the previous studies in Egypt provided minimal data about the prevalence of EDs. A recent study of 432 Jordanian schoolgirls found that one-third of the participants had EDs.[12] In Egypt, Fawzi *et al*.[13] detected that 11.2% of secondary schoolgirls in Sharkia Governorate had a score above an EAT-40 score of 30, indicating the diagnosis of EDs. This might be attributed to the high level of concern about body shape that is reinforced by ideas about perfectionism that considered thin-ideal body as a standard of feminine beauty. This study revealed that more than half (65.0%) of the patients attending the weight management centers in Tanta were complaining of EDs, which was higher than what was reported by other studies. This could be attributed to the fact that this current study was carried out on the weight management centers, which are more at risk of EDs. In addition, the target group of this study included wider age group rather than other studies.

Regarding sociodemographic characteristics that may contribute to the development of EDs, the data of this study suggested that EDs were more common among females, since most of the females considering thin is to be attractive, healthy, and self-disciplined, and the overweight is perceived as unattractive, lazy, and probably incompetent. The same was reported by the studies of McCarthy,[14] Ansari,[15] and Striegel-Moore *et al*.,[16] as women were more dissatisfied with their body than men, so women were more liable to have EDs.

In this study, we found that EDs were more common among those who were married. This was in agreement with the results of Costa-Font and Jofre-Bonet[17] which showed that EDs were more common among married women, as married women were more exposed to stressful events (e.g., childrearing, housekeeping, and community work) that might affect their eating behaviors.

The current study also showed that EDs were more common among urban individuals. This might be related to the cultural idea of thinness, which was more common in urban areas. Wassenaar *et al*.[18] also reported that ED was associated with urban living among females in South Africa. Van Son *et al*.[19] declared that EDs were significantly higher in cities than rural areas. Among secondary schoolgirls from Sharkia Governorate in Egypt, Fawzi *et al*.[13] revealed significantly more cases of EDs in the urban group than the rural one.

Regarding the educational level of the studied individuals, this study reported that EDs were more common among the highly educated individuals. This was in agreement with the results of Toro *et al*.,[20] which showed that highly educated females from higher social class complained of more EDs.

Regarding the relation of BMI and EDs, more than half of the obese individuals suffered from EDs. Obesity was considered a risk factor in the emergence of EDs and it is among one of the causes of EDs.[21] Overweight girls showed some of the psychological features associated with the development of EDs, including a link between concerns and self-esteem based on physical appearance.[22,23] Community studies showed that binge eating rates were higher in obese than normal-weight adults.[24] Sharing knowledge and expertise between experts in the fields of obesity and EDs was likely to benefit both and offer new strategies for prevention and treatment of both disorders.[25]

In the current study, most of the individuals complaining of EDs had depression and/or psychological problems. This was reported consistently by other studies, which showed that a history of psychological disorder was demonstrated as an important element in the development of EDs.[26,27] Mental disorders such as depression, psychosis, and schizophrenia had a great association with EDs and management of these mental problems could improve the associated EDs.[28]

The mean score of EAT-40 in this study was 45.2 ± 10.2 (25–66), which was much higher than that reported by Talwar[11] in a study of Malaysian University students with the mean score of 18.28 ± 9.40 (3–39). Factor analysis of EAT-40 resulted in four factors accounting for 33.2% of the total variance, this was similar to what had been reported by Talwar[11] (33.16% of the total variance), but only three factors were extracted by Garner *et al*.[29] (40.2% of the total variance) and Pereira *et al*.[30] (27.74% of the total variance). In the current study, three items failed to load and resulted in EAT-37, this was different from the studies of Talwar,[11] Garner *et al*.,[29] and Pereira *et al*.[30] with 6, 14, and 15 items failed to load, respectively. These differences could be attributed to the sociocultural differences of the nature and number of the study groups.

There were some limitations in this study. This study was carried out in weight management centers and the results could not represent the whole population. It was also limited to only one governorate and not covering the whole delta region. Depression in this study was self-reported and not clinically diagnosed; this could cause fake high prevalence. Only association could be obtained from this study while temporal relationship between cause and effect could not be explored.

In conclusion, EDs are severe illnesses that often have a variety of complications. EAT-40 is a widely used screening instrument to detect EDs. The high prevalence of EDs among those attending weight management centers should pay attention to specific management strategies targeting those patients. Further research is recommended to replicate the present findings and to examine other variables including religious values that could be considered as risk factors of EDs.

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Conflicts of interest

There are no conflicts of interest.

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