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Original article

Prevalence of Eating Disorders among Female University Medical Students in Dammam, Saudi Arabia

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ABSTRACT

Background: The social media pressure on women to be thin and the advertisement for strict diet plans have been linked to the expression of serious eating disorders. The prevalence of eating disorder risk in university students is high and is associated with unhealthy weight-control practices .Eating disorders is known to have the highest mortality rate of any mental illness. *Objectives:*The study aimed to estimate the risk of eating disorders and its association with body weight among female medical students in Imam Abdul Rahman Bin Faisal University (IAU) in Saudi Arabia.**Method:** This cross-sectional study surveyed 557 female students at IAU. Data was collected by self-administered questionnaire filled by all Saudi female medical students .Analysis was done using SPSS version16. **Results:** 14.1% of female medical students were at high risk for eating disorders. There was a significant correlation between Eating Disorder Examination- Questionnaire score (EDE-Q), BMI and self-perception of weight (P<0.001). By logistic regression analysis, the factor that was found to be significantly associated with high risk of eating disorders was abnormal self-perception of weight with a p value = 0.002. **Conclusion:** The prevalence of eating disorders risk in female university students is high and is associated with unhealthy weight-control practices which correlates with similar results in previous studies these results may be taken to improve early detection and management of eating disorders among female students in the university campuses.

KEYWORDS: Eating disorders, EDE-Q, Female, University students, Saudi Arabia

INTRODUCTION

The social media pressure on women to be thin and the advertisement for strict diet plans have been linked to the expression of serious eating disorders[1].According to the American Psychiatric Association's Diagnostic and Statistical Manual, fifth Edition, (DSM-V), eating disorders include: Anorexia nervosa, Bulimia nervosa, Other Eating & Feeding Disorders which include Pica, avoidant/restrictive food intake disorder, binge eating disorder, rumination disorder, other specified and unspecified feeding or eating disorder[2].

Sepulveda *et.al* found that the prevalence rate of students at high-risk for an eating disorder was 14.9% for males and 20.8% for females, according to an overall cut-off point of the Eating Disorder Inventory questionnaire (EDI). Prevalence rates presented statistically significant differences by gender but not by school or academic year, and they concluded that the prevalence of eating disorder risk in university students is high and is associated with unhealthy weight-control practices[3].

Studies have found that eating disorders have the highest mortality rate of any mental illness [4,5].According to the National Association of Anorexia Nervosa and Associated Disorders about 5 – 10% of anorexics die within 10 years after contracting the disease; 18-20% of anorexics will be dead after 20 years and only 30 – 40% ever fully recover. The mortality rate associated with anorexia nervosa is 12 times higher than the death rate of all causes of death for females 15 – 24 years old. Twenty percent of people suffering from anorexia will prematurely die from complications related to their eating disorder, including suicide and heart problems [4,6].

Unfortunately, only 1 in 10 men and women with eating disorders receive treatment and only 35% of people that

receive treatment for eating disorders get treatment at a specialized facility for eating disorders [7].

Reliable and valid instruments for assessment and diagnosis are the keys for the identification of eating disorders. While diagnosing eating disorders requires an interviewer's assessment [8], self- report questionnaires represent economic and non-intrusive approaches to assess eating disturbances. One well-established self-report questionnaire that allows for comprehensive assessment of eating disturbances is the Eating Disorder Examination-Questionnaire (EDE-Q) which has around 83% sensitivity and 96% specificity [8,9,10].

Studies on eating disorders in the Middle East are disproportionate to the actual effect of eating disorders within the region. In the Kingdom of Saudi Arabia (KSA) there is lack of enough studies addressing this problem. The aim of the present study was to estimate the risk of eating disorders among female medical students in Imam Abdul Rahman Bin Faisal University in Saudi Arabia and its association with Body Mass Index (BMI).

MATERIALS AND METHODS

Study Design:

This was a cross-sectional study conducted in Imam Abdul Rahman Bin Faisal University (IAU), Eastern Province, KSA, among female medical students from the College of Medicine. The target population consisted of all registered female students in the college from the 2nd to the 6th year. Their total number was 557 and 414 completed the questionnaire with a response rate of 74.3% and 95 questionnaires were incomplete, therefore they were excluded and only 319 complete questionnaires were included in the study. The study was approved by the ethical committee of Postgraduate Saudi Board Program in family medicine, Eastern Province. Also, approval was obtained from the College of Medicine and the university authorities and the objectives of the study were explained to the participating students after which they gave their informed consent and they were assured that their information will be kept confidential and the data will be used for research purposes only.

Data was collected using the Eating Disorder Examination Questionnaire (EDE-Q). The EDE-Q is a 28-item self-report measure of eating disorder psychopathology, it focuses on the previous 28 days and measures core eating disorder behaviors and the core pathology of eating disorders. It is comprised of one global score and four subscales: dietary restraint, eating concern, weight concern and shape concern. Responses were rated on a 7-point Likert scale, except the items related to the frequency of behavior. This questionnaire includes socio-demographic data, self-reported "weight, height", healthy habits such as weight control compensatory strategies which include dieting, vomiting or use of laxative and the regularity of menstrual cycle [2,11] .

Items within each subscale were summed to provide subscale scores. The global score was calculated by summation of the 4 subscale scores and the global as well as the subscale scores were divided into 2 equal groups, namely low risk and high risk, where higher scores are indicative of higher eating disorders psychopathology[11].

Body Mass Index (BMI): was classified as, Underweight (BMI <18.5 kg/m2); Normal (BMI=18.5-24.99 kg/m2); (BMI Overweight (BMI=25-29.99 kg/m2); Obese Class I (BMI= 30-34.99 kg/m2); Obese Class II (BMI=35-39.99 kg/m2); and Obese Class III (BMI ≥40.0 kg/m2). For the ease of statistical analysis, associations and interpretation of the results, BMI classification was categorized into 4 groups: underweight; normal; overweight, and obese (includes obese class 1, II, and III) [12].

Statistical Analysis:

The collected data were reviewed, coded, verified and statistically analyzed using the Statistical Package for Social Sciences (SPSS) software version 16 (SPSS Inc., Chicago, Illinois, USA)[13].Descriptive statistics for all studied variables, Chi-square and Fisher's exact tests were used. Logistic regression analysis was used to find the factors predicting occurrence of high risk of eating disorders. A p-value of < 0.05 was considered significant throughout the study.

RESULTS

The studied female medical students were in the age group 18-27 years with a mean age of 21.16 ± 1.68 years. More than three quarters (76.2%) of students were single and 23.5% were married. The majority of students had no children (92.2%). One quarter of them was in the third year medical. About 62.1% of the studied sample had a family income more than 15000 SR. Majority of students had no history of chronic diseases (89.4%) nor history of family problems (88.4%) (Table1).

Table1: Socio-demographic characteristics of the studied female medical students

Socio-demographic characteristics	Total (n=319) No. (%)
1.Marital status:	
Single	243 (76.2)
Married	75 (23.5)
Divorced	1 (0.3)
2.Year of Studying:	
Second year	73 (22.9)
Third year	80 (25.1)
Fourth year	56 (17.6)
Fifth year	48 (15)
Sixth year	62 (19.4)

3.Number of Children	
No children	294 (92.2)
1 child	16 (5)
2 children	7 (2.2)
3 children	2 (0.6)
4.Family income in Saudi Riyal	
less than 5000	15 (4.7)
5000-15000	106 (33.2)
More than 15000	198 (62.1)
5.History of chronic diseases: *	
No chronic	285 (89.3)
Diabetes	6 (1.9)
Cardiac	0 (0.0)
Bronchial	7(2.2)
Neurological	1(0.3)
Dermatological	4(1.3)
Disability	0 (0.0)
Psychiatric	4 (1.3)
Others	18 (5.6)
6.History of family problems: *	
No family problem	282 (88.4)
Marital disputes	11 (3.4)
Domestic violence	4 (1.3)
Addiction	2 (0.6)
Intellectual disability	6 (1.9)
Impaired sensory	0 (0.0)
Impaired mobility	5 (1.6)
Polygamy	14(4.4)
Others	5 (1.6)

*The response categories were not mutually exclusive

By studying the EDE-Q global score it was found that 45 (14.1%) of the studied medical female university students had high risk to develop eating disorders. Moreover, the EDE-Q subscale score showed that 85 (26.6%) had high risk in shape concern subscale, 54 (16.9%) had high risk in weight concern, 35 (11%) had high risk in dietary restraints subscale and 15 (4.7%) had high risk in eating concern. (Table 2)

Table 2: Distribution of the university students according to their EDE-Q Global & subscale scores

EDE-Q Global & subscale scores	**Low risk (n=274)** **NO.(%)**	**High risk (n=45)** **NO.(%)**
Global score	274 (85.9)	45 (14.1)
Dietary restraints	284(89)	35(11)
Eating concern	304(95.3)	15(4.7)
Weight concern	265(83.1)	54(16.9)
Shape concern	234(73.4)	85(26.6)

The proportion of the sample that reported regular (once a week) objective binge eating episodes was 11.6% and 10.7% had subjective binge eating. Approximately 3.5% of the studied group reported regular (once a week) self-induced vomiting episodes, in the other hand 2.5% reported regular use of laxative. About 8.5% of the students reported regular dietary restrain while 2.2% reported regular excessive exercise (five times per week) (Table 3).By studying the association between EDE-Q global score and all socio-demographic variables, it was found that there was a statistical significant association (X^2= 48.8, P<0.001) between EDE-Q global score and the Body mass index (BMI); 31.1% of high risk students were obese, 28.9% were overweight while 37.8% of high risk students had normal BMI (Table 4).

Moreover, it was found that 17.8 %(57 out of the 319) of the studied female medical students were found to be underweight.

Table 3: Proportion of a studied female who reported engaging in disordered eating behaviors over the past 28 days

Frequency of eating behaviors	None of the time	Any occurrence	Regular occurrence
	NO. (%)	NO. (%)	NO. (%)
Dietary restrain	**248 (77.7%)**	**44 (13.8%)**	**27 (8.5%)**
Subjective binge eating	**201 (63%)**	**84 (26.3%)**	**34 (10.7%)**
Objective binge eating	**178 (55.8%)**	**104 (32.6%)**	**37 (11.6%)**
Self-induce vomiting	**293 (91.8%)**	**15 (4.7%)**	**11 (3.5%)**
Use of laxative	**298(93.4%)**	**13(4.1%)**	**8(2.5%)**
Excessive exercise	**238(74.6%)**	**74(23.2%)**	**7(2.2)**

Also, there was a statistical significant association between EDE-Q global score and weight perception (X^2=49.6, P<0.001), about 53.3% of high risk students perceived themselves as overweight, 17.5% perceived themselves as obese, and 28.9% of high risk students perceived themselves as normal weight. (Table 4)

Table 4: Association between Global EDE-Q score and socio-demographic variables

	Global EDE-Q score		Test of significance (p-value)
	Low risk (n=274)	High risk (n=45)	
	NO. (%)	NO. (%)	
1-Body Mass Index:			
Underweight	56(20.4)	1(2.2)	X^2= 48.8 P<0.001
Normal	158(57.7)	17(37.8)	
Overweight	45(16.4)	13(28.9)	
Obesity	15(5.5)	14(31.1)	
2-Weight perception:			
Perceive herself as underweight	44(16.1)	0(0)	X^2=49.6 P<0.001
Perceive herself as normal	170(62)	13(28.9)	
Perceive herself as overweight	51(18.6)	24(53.3)	
Perceive herself as obese	9(3.3)	8(17.8)	
3- Use of contraceptive pill :			
Yes	7(2.6)	4(8.9)	FET= 4.6 P=0.054
No	267(97.4)	41(91.1)	
4- Missed period:			
No missed period	243(88.7)	34(75.6)	X^2= 7.9 P=0.096
Missed 1 period	17(6.2)	4(8.9)	
Missed 2 periods	9(3.3)	5(11.1)	
Missed 3 periods	2(0.7)	1(2.2)	
Missed 4 periods	3(1.1)	1(2.2)	

There was no statistical significant association between the global EDE-Q global score and the following factors: marital status, number of children, and year of studying, family monthly income, and contraceptive pill usage. There was no significant correlation between the EDE-Q global score and missing period (P=0.096), but about 24.4% of high risk students missed 1 to 4 periods, the remaining three quarter high risk students didn't missed any period. (Table 4)

The Logistic regression analysis of significant factors predicting high risk of eating disorders showed that only abnormal self-perception of weight was found to be statistically significantly predicting the occurrence of high risk of eating disorders. Studied females who abnormally perceived their weight were significantly 3.3 times more likely to have high risk of eating disorders (OR=3.308; 95% C. I. 1.557–7.026; p-value = 0.002). Table (5).

Table 5: Logistic regression analysis of significant factors predicting occurrence of high risk of eating disorders

Variables	B coefficient	S.E	P-value	O.R.	95% confidence interval of O.R.	
					Lower	Upper
Self-perception of weight	1.196	0.384	0.002	3.308	1.557	7.026
constant	1.382	41.005	0.973	3.982	-	-

DISCUSSION

Eating Disorders are a significant public health problem, not only because they are associated with substantial psychological and medical comorbidity, functional impairment, and high medical costs, but also because they are often poorly recognized and undertreated, action is required to prevent Eating Disorders and to support identification, early intervention, and readily accessible, evidence-based treatment throughout all stages of the illness process [14].

In the present study questionnaires were distributed to all the 557-registered female medical students in IAU, 414 students had filled the questionnaire (with a response rate of 74.3%), and only 319 questionnaires were filled completely. The percentage of students who answered the questionnaires completely was 57.2% (319/557), which is considered satisfactory, even though it was lower than that of other studies carried out on a university sample (66% in Forman-Hoffman 64% [15] ,in Futch and colleagues [16],but higher than 54% response rate in Sepulveda AR [3] and 37% response rate in the study conducted by Anstine and colleagues [17].

The present study showed that the prevalence of female university students population at high-risk of developing an eating disorders using the EDE-Q 6.0 (global score >50%) was 14.1%, which is lower than the result reported by Sepulveda AR study (20.8% for females and 14.9% for males)[3], keeping in mind that they have used different eating disorder screening tools namely Eating Disorders Inventory (EDI). The main factor which was taken into account was the decision to use an overall score as the screening point, in previous studies that used EDE-Q version 6.0, a global score was calculated by summing and averaging the subscale scores. Higher scores are indicative of higher ED (eating disorder) psychopathology[11]. So, in the present study studied female was considered at risk when she got a global score of more than 50% of total score. This is in accordance with other studies which used EDI the global score ≥ 50 to screen the at-risk population for ED[3,18,19].

Results of the present study found that a substantial proportion of studied female students in IAU were concerned about their shape and weight. It found that almost 26.6% and 16.9% of the sample scored in the clinically significant range for shape and weight concerns, respectively, based on a cut-off score (>50%) i.e. at high risk. These proportions were higher than previous normative studies conducted in the Norway among university women (11% and 7%), respectively [20], in the USA among university women (15% and 19%), respectively [21].

Regarding unhealthy eating behaviors that was associated with high risk for developing ED approximately 11.6% of our sample engaged in regular binge eating, compared to 8%, in Norway[20],6.4% in an American sample of university women [21]. Approximately 3.5% reported engaging in regular self-induced vomiting in the present study, compared with 2%, 1.4% in the Norway, and American studies, respectively [20,21].The proportion of female students that regularly engaged in excessive exercise (at least five times per week) was 2.2% in the current study, compared to 7%in Norway and 5.9% in the USA studies [20,21].

CONCLUSION

A significant proportion of female medical students in IAU are at high risk for eating disorders, so strategies should be designed to prevent occurrence of such disorders among university students that would undoubtedly hinder the availability of dependable medical services in future. Also further studies are needed to determine the prevalence of eating disorders in general population.

Limitations

One of the limitations of this study was using a self-reported questionnaire that has the possibility of reporting bias. Another limitation was being a cross-sectional study which showed the relation between variables but impedes the detection of the cause-effect relationship. Generalization of the results is somewhat limited because participants were

university students and replication of this study for targeting the general population should be made in order to generate a more solid relationship among the constructs examined in this study.

Competing interest: The authors declare that they have no competing interests.

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