

Screening the risk of eating disorders among adolescents in primary care centres in Makkah, Saudi Arabia

Nahla Hariri

Department of Community Medicine and Health Care for Pilgrims, Faculty of Medicine, Umm Al-Qura University, Makkah 24538, Saudi Arabia

Correspondence:

Nahla H Hariri

Department of Community Medicine and Health Care for Pilgrims

Faculty of Medicine, Umm Al-Qura University

Zip code: 24382, Makkah city, Saudi Arabia

Email: nhhariri@uqu.edu.sa

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Abstract

Background: Adolescence is a period of transition in which adolescents are preoccupied with their body shape and image. Eating disorders among adolescents have become a mental health issue globally because they can cause deficient ingestion and/or overeating, even resulting in death. The prognosis of the illness is improved by early screening and treatment, however, we have insufficiently assessed adolescents in primary care services for the risk of eating disorders.

Aim of the study: To screen whether adolescents who visited primary healthcare centres with their parents were at high risk of eating disorders in Makkah, Saudi Arabia.

Methods: The participants completed a self-report screening questionnaire (the SCOFF screening tool).

Results: Of the 428 participants, 237 (55.4%) had a SCOFF score of ≥ 2 . Being overweight (22.9% vs 10.0%) and obese (19.4% vs 5.0%, $p < 0.001$), having been diagnosed with eating disorders previously (21.9% vs 8.6%, $p < 0.001$), using laxatives for weight loss (8.3% vs 0.0%, $p < 0.001$), having the feeling of being fat (85.1% vs 38.6%, $p < 0.001$), being on a diet (24.0% vs 9.3%, $p < 0.001$), and overeating during periods of stress (50.7% vs 22.1%, $p < 0.001$) were found to increase the risk of suffering eating disorders.

Conclusions: Preventive programmes in primary care are needed to avoid the negative consequences of eating disorders.

Keywords

Primary care; mental health; screening tool; adolescents

Introduction

Adolescence is a transitional period in which adolescents are preoccupied with their body shape and image. A mix of mental, physical, and social problems characterise eating disorders (EDs), which affect people worldwide and may cause sufferers to have low self-esteem (1, 2). The negative consequences and costs of EDs have been examined in depth, as they can cause deficient ingestion and/or overeating, even resulting in death.

EDs are also known as comorbid psychopathologies (3-6), thereby placing affected individuals at risk of suffering critical complications, including stunted growth, salivary gland hypertrophy, dental erosion, cheilosis, hypovolemia, electrolyte imbalance, periodontitis, and weight gain. In addition, EDs affect individuals' social lives and relationships. Moreover, the suicidal ideation rate is higher among those affected, along with increased chances of abortion among young women (7, 8).

EDs are ranked as the third most frequently observed mental illness (9). Bulimia nervosa, binge eating disorder, and anorexia nervosa are the three EDs that have the highest death rates of all mental illnesses (2). First, because anorexics fear gaining weight, they stay very thin. Second, a cycle of binge eating followed by efforts to burn off the extra calories is the feature of bulimia. Third, a large unmanageable quantity of food is often consumed during binges by people with binge eating disorder.

People of any age, sex, race, or ethnicity are at risk of suffering EDs (10). While bulimia nervosa and anorexia nervosa most frequently manifest during adolescence, binge eating disorder typically first appears in patients in their mid-twenties (11). Although the reasons underlying EDs are unclear, a combination of factors is thought to contribute to their development, such as sociocultural factors, family dynamics, interpersonal experiences (e.g., stress), and a past record of childhood abuse or personality disorders (12-16). All these risk factors have been strongly suggested to be linked with EDs.

The prevalence rate of EDs has increased in both western and non-western nations (17). The prevalence rate among western women has been found to be up to 5.7% and anorexia nervosa is thought to affect women more than men. The prevalence rates of bulimia nervosa reach 7.3% among western women and 2.1% among western men. By contrast, Bulimia nervosa prevalence rate among female patients in non-western nations is reported to be 3.2% (18-21). In the Middle East, the prevalence rates are 33.1–49.1% in Emirati men and 24% in women (22-24) and 38.2% in Palestinian women (25). Recent studies in Saudi Arabia have focused on assessing the risk of EDs among adolescents using the SCOFF questionnaire. A study published in 2021 (26) found that around 46% of adolescents in secondary schools have the possibility of developing EDs.

While EDs are thought to be a mental illness, they may also trigger other severe physical health issues. Hence, the earlier these illnesses are identified and evaluated, the greater is the likelihood of effective therapy and a faster recovery. Therefore, the purpose of this research is to identify adolescents at risk for eating disorders who visited primary healthcare centres (PHCCs) with their parents in Makkah, Saudi Arabia.

Materials and Methods

Study design

This analytical cross-sectional research screened adolescents who attended PHCCs with their parents for the risk of EDs. The study included 428 participants, who were approached while visiting these clinics, by distributing the online questionnaire using a QR code.

Study setting

The setting of this research was Makkah, which is considered to be the holiest city in Islam as well as a significant city in Saudi Arabia's western area. The holy mosque is situated in the city's centre. Millions of pilgrims travel to Makkah every year to perform Islamic rites. As a result, the social, cultural, and educational backgrounds of the population vary greatly. Its around two million residents are spread over 60 districts. Residential neighbourhoods determine the location of these PHCCs.

The health authorities divide Makkah city into four sectors (north, east, west, and south). Sampling and randomisation were performed based on the distribution of the PHCCs. From each sector, two PHCCs were chosen. Hence, eight PHCCs in total were first chosen randomly from the list of the PHCCs in the area. Next, individuals who visit the clinics for any reason were chosen using simple random sampling. To obtain approval to conduct the survey, the researcher contacted the PHCC management team and explained the nature and procedure of the study.

The second phase involved approaching each participant and their parents and providing them with a cover letter and an online self-report survey via a QR code. The act of completing the questionnaire implied consent to participate. To ensure anonymity, a signed informed consent waiver was acquired. The researcher visited the clinics throughout the recruiting period (April to October 2022) to find participants for the study.

Sample size

The sample size was determined using a previously published prevalence [26], a type-I error rate of 5%, and a type-II error rate of 20%. The required sample was 383 participants; however, 472 respondents who went to the clinics with their parents during the recruiting period were asked to take part in the study. Forty-six of these respondents were omitted because of missing primary outcomes in the SCOFF survey and 12 respondents were removed from the research sample because they were over the age of 24. Therefore, 428 respondents were included in this study.

Ethical review

The Faculty of Medicine at Umm Al-Qura University's local research and ethics committee approved the study (HAPO-02-K-012-2022-11-1263).

Data collection

All the participants of the research completed a self-report screening questionnaire, namely, the SCOFF questionnaire. Demographic data were collected (age, sex, education level, height, weight, previous history/family history of mental illnesses, previous bariatric surgeries, diet history, and use of laxatives). All participants and their parents voluntarily provided their informed consent. Using self-reported height and weight, the body mass index was calculated.

The SCOFF survey is a very accurate self-administered questionnaire commonly used as an ED screening tool. It contains five yes/no questions scored 1 for yes and 0 for no. Scores of 2 or over were set as the cut-off point for maximum sensitivity to detect anorexia and bulimia nervosa (27). The sensitivity of the SCOFF survey in the primary care setting is 84.6% and its specificity is 89.6% (28). Arabic versions of the scale have been validated, with a sensitivity of 80.0%, a specificity of 72.7%, and an area under the curve of 80.0% at two affirmative answers (29).

Statistical analysis

Using RStudio (R version 4.1.1), the data were analysed. Categorical data were represented by frequencies and percentages, whilst continuous variables were characterized by the median and interquartile range (IQR). Factors associated with the risk of EDs were assessed using the Wilcoxon rank sum test for the numerical data and a Pearson's Chi-squared test for the categorical data. Independent risk factors for having EDs were explored by constructing a binary logistic regression model using the dichotomous SCOFF variable (SCOFF score <2 vs ≥2) as the dependent variable. The significantly associated variables from the univariate analysis were used as the independent variable in the regression model. The results were displayed as odds ratios (ORs) and their respective 95% confidence intervals (95% CIs). A 0.05 p value signified statistical significance.

Results

Demographic characteristics

The data on the 428 participating adolescents were analysed. The median (IQR) age of the participants was 20.0 (19.0, 22.0) with a range of 15 to 24 years. The majority of the respondents were women (72.2%). Approximately half had a healthy weight, whereas overweight and obese participants represented 18.7% and 14.7% of the sample, respectively. A history of an eating disorder was apparent among 17.5%, while 14.3% of the respondents had a family member with an ED (Table 1).

History of mental illnesses

Altogether, 109 participants (25.5%) declared that they had a history of a mental illness. Of these, the most common illnesses included depression (31.2%) and anxiety (17.4%, Figure 1A). Furthermore, a previous family history of mental illnesses was reported among 89 participants (20.8%); depression (51.7%) and anxiety (24.7%) were again the most frequent illnesses (Figure 1B).

Surgical history and nutritional and behavioural characteristics

In total, 72 participants had a history of surgery; of these, 6.9% had undergone both minor and major surgeries. Although 69.9% of the participants had the feeling of being fat, only 19.2% were on a diet. Additionally, 5.6% of the respondents were using laxatives to lose weight. Frequently adopted behaviours while stressed were sleeping (48.8%), overeating (41.4%), and avoiding eating (33.9%, Table 2).

Results of the SCOFF questionnaire

Of the 428 participants, 237 (55.4%) had a SCOFF score of ≥2. Approximately half of the respondents agreed that they worry about losing control of the amount of food they consume (50.2%) and 40.4% stated that food dominates their lives. Conversely, the majority disagreed that they have recently lost one stone in a three-month period (83.6%) and have made themselves sick because of feeling uncomfortably full (73.4%, Figure 2).

Factors linked to the risk of EDs

The possibility of EDs (SCOFF ≥2) was significantly higher among overweight (22.9% vs 10.0%) and obese adolescents (19.4% vs 5.0%, $p<0.001$) as well as those having a history of EDs (21.9% vs 8.6%, $p<0.001$), using laxatives for weight loss (8.3% vs 0.0%, $p<0.001$), having the feeling of being fat (85.1% vs 38.6%, $p<0.001$), being on a diet (24.0% vs 9.3%, $p<0.001$), and overeating during stressful periods (50.7% vs 22.1%, $p<0.001$). By contrast, the possibility of EDs was significantly lower among adolescents who perform other activities during periods of stress (5.9% vs 15.7%, $p<0.001$, Table 3).

Independent risk factors for EDs

The following independent risk factors were found based on the multivariate regression analysis: having a history of EDs (OR=2.76, 95% CI, 1.30 to 6.32, $p=0.011$), having the feeling of being fat (OR=5.10, 95% CI, 2.88 to 9.22, $p<0.001$), and overeating during periods of stress (OR=2.50, 95% CI, 1.47 to 4.30, $p<0.001$). However, carrying out other activities during stressful periods was less likely to be associated with EDs (OR=0.36, 95% CI, 0.17 to 0.76, $p=0.008$, Table 4).

Table 1: Demographic characteristics of the participants (n=428).

Parameter	Category	N (%)
Age*	Years	20.0 (19.0, 22.0)
Gender	Male	119 (27.8%)
	Female	309 (72.2%)
Weight*	Kg	60.0 (48.0, 70.0)
Height*	cm	160.0 (155.0, 167.2)
BMI*	Kg/m ²	22.6 (19.6, 26.5)
BMI	Underweight	72 (16.8%)
	Healthy	213 (49.8%)
	Overweight	80 (18.7%)
	Obese	63 (14.7%)
History of eating disorders	Yes	75 (17.5%)
Family history of eating disorders	Yes	61 (14.3%)

*Data is expressed as median (interquartile range); otherwise, data is presented as frequency and percentage.

Figure 1: the percentages of psychological diseases among patients with a personal history (A) and a family history (B) of psychiatric illnesses. The numbers of included participants were 109 and 89 in panel A and B, respectively.

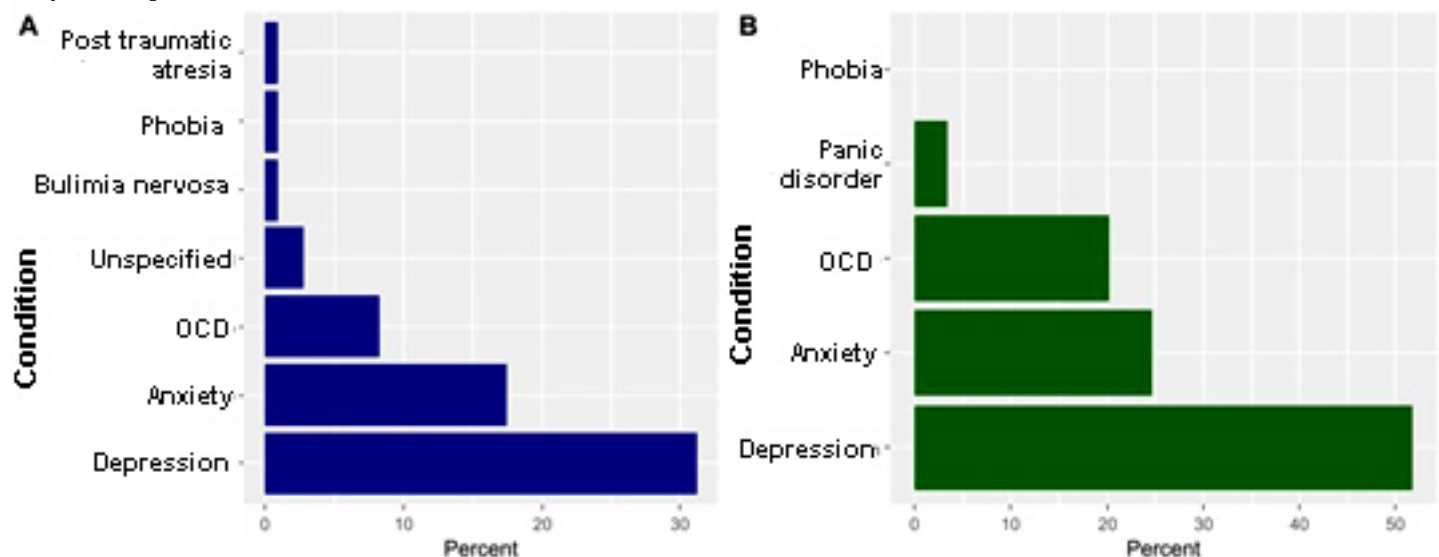


Table 2: Surgical history and selected nutritional and behavioral characteristics.

Parameter	Category	N (%)
History of surgery	Yes	72 (16.8%)
Type of surgery	Major surgery	10 (2.3%)
	Minor surgery	65 (15.2%)
	Both major and minor	5 (6.9%)
	Unknown	2 (2.8%)
Use laxative to lose weight	Yes	24 (5.6%)
Have the feeling of being fat	Yes	299 (69.9%)
Currently on a diet	Yes	82 (19.2%)
Having regular period (females)*	Yes	215 (69.6%)
Behaviour during stress	Eat a lot	177 (41.4%)
	Avoid eating	145 (33.9%)
	Sleep	209 (48.8%)
	Do sport	73 (17.1%)
	Do other activities	39 (9.1%)

* descriptive data are presented based on 309 females

Table 3: Factors associated with the risk of eating disorders among adolescents.

Parameter	Category	SCOFF		
		<2, N = 140	≥2, N = 288	p-value
Age		21.0 (19.0, 23.0)	20.0 (19.0, 22.0)	0.182
Gender	Male	45 (32.1%)	74 (25.7%)	0.162
	Female	95 (67.9%)	214 (74.3%)	
BMI	Underweight	47 (33.6%)	25 (8.7%)	<0.001
	Healthy	72 (51.4%)	141 (49.0%)	
	Overweight	14 (10.0%)	66 (22.9%)	
	Obese	7 (5.0%)	56 (19.4%)	
History of eating disorders	Yes	12 (8.6%)	63 (21.9%)	<0.001
Family history of eating disorders	Yes	17 (12.1%)	44 (15.3%)	0.384
History of psychiatric diseases	Yes	37 (26.4%)	72 (25.0%)	0.750
Family history of psychiatric diseases	Yes	27 (19.3%)	62 (21.5%)	0.592
History of surgery	Yes	21 (15.0%)	51 (17.7%)	0.482
Use laxative to lose weight	Yes	0 (0.0%)	24 (8.3%)	<0.001
Have the feeling of being fat	Yes	54 (38.6%)	245 (85.1%)	<0.001
Currently on a diet	Yes	13 (9.3%)	69 (24.0%)	<0.001
Having regular period (females)*	No	30 (31.6%)	64 (29.9%)	0.790
	Yes	65 (68.4%)	150 (70.1%)	
Behaviour during stress	Eat a lot	31 (22.1%)	146 (50.7%)	<0.001
	Avoid eating	56 (40.0%)	89 (30.9%)	0.062
	Sleep	63 (45.0%)	146 (50.7%)	0.269
	Do sport	29 (20.7%)	44 (15.3%)	0.161
	Other	22 (15.7%)	17 (5.9%)	<0.001

*data are presented based on 309 females

Table 4: Risk factors for having a SCOFF score ≥ 2 .

Parameter	Category	OR	95% CI	p-value
BMI	Underweight	—	—	
	Healthy	1.17	0.58, 2.35	0.651
	Overweight	1.78	0.70, 4.62	0.229
	Obese	2.46	0.83, 7.91	0.114
History of eating disorders	No	—	—	
	Yes	2.76	1.30, 6.32	0.011
Use laxative to lose weight	No	—	—	
	Yes	NA	NA	0.983
Have the feeling of being fat	No	—	—	
	Yes	5.10	2.88, 9.22	<0.001
Currently on a diet	No	—	—	
	Yes	2.07	1.00, 4.55	0.057
Eat a lot	No	—	—	
	Yes	2.50	1.47, 4.30	<0.001
Other	No	—	—	
	Yes	0.36	0.17, 0.76	0.008

NA: non-available due to zero frequencies; OR: odds ratio; CI: confidence interval

Discussion

The purpose of the current research was to assess the risk of adolescents who visit PHCCs in Makkah, Saudi Arabia developing EDs. The average age of the respondents was 20.0 years with a range of 15 to 24 years and more than half were women. Approximately half of the participants had a healthy weight, whereas 17% had a history of an eating disorder and 14.3% had a family member with an eating disorder. This result supports that of Ziobrowski's study (30) finding that 28.3% of young females reported symptoms fitting the criteria for an eating disorder and 12.4% of these girls reported receiving treatment over a one-year period. Girls whose mothers had a history of EDs had an increased likelihood of both experiencing eating disorder symptoms and seeking treatment. Hence, screening girls and their mothers for current or previous eating disorders may be essential for the prevention and diagnosis of eating disorder symptoms.

Female adolescents and young adults are more prone to developing EDs, anxiety disorders, and depression. In the current study, over one-quarter (25.5%) of the participants reported a history of a mental illness. Of these, the most common illnesses were depression and anxiety (31.2% and 17.4%, respectively). Moreover, 20.8% of the participants reported a family history of mental illnesses; depression (51.7%) and anxiety (24.7%) were again the most frequent illnesses. The study conducted by Sander (9) explored the inter-individual variations in the relationships among anxiety, depression, and eating disorder-related disability among 320 girls aged 12 to 25. A high level of anxiety/depression impairment was found to be related to more

severe eating disorder symptoms. Another study (31) examined the incidence of co-occurring eating and anxiety disorders among women seeking inpatient and outpatient treatment for an eating disorder and women seeking outpatient treatment for an anxiety condition. Among those women seeking treatment for an eating disorder, 65% fulfilled the criteria for at least one comorbid anxiety disorder and 69% of these women claimed that their anxiety condition began before the eating disorder. Social phobia was the most often diagnosed anxiety disorder, followed by post-traumatic stress disorder, generalised anxiety disorder, obsessive-compulsive disorder, panic/agoraphobia, and specific phobia. In addition, 13.5% of the women seeking treatment for anxiety matched the criteria for a concurrent eating problem, while 71% claimed that their anxiety condition appeared before the eating issue. As eating disorder symptoms link more significantly with anxiety and depression symptoms and other mental illnesses in early adolescence than in other life stages, preventive measures must consider screening all mental comorbidities.

In this study, based on the answers to the SCOFF questionnaire, the risk of adolescents who visit PHCCs suffering anorexia and bulimia nervosa was 55.4%. This finding is similar to that of previous studies that have used the same SCOFF screening tool. For example, one study conducted in Makkah reported that 46% of school-aged adolescents are at risk of EDs (26). Another study in Samarinda (32) reported that 57.4% of its participants aged 14 to 17 years and over were at risk of EDs. Therefore, the SCOFF is an easy-to-administer screening device that primary care professionals can use to identify EDs.

The present study found that different underlying causes are linked to an increased risk of suffering an eating disorder (SCOFF ≥ 2). In particular, being overweight (22.9% vs 10.0%) and obese (19.4% vs 5.0%, $p < 0.001$) was a risk factor. Teenagers with obesity are susceptible to EDs. Teens often present with atypical or subthreshold criteria owing to excessive body weight or concerns about the prevalence of a distorted body image. The recognition and treatment of EDs may be delayed in patients with premorbid overweight or obesity and subsequent weight reduction (33, 34). Moreover, this study found an association between patients who had a history of EDs (21.9% vs 8.6%, $p < 0.001$), using laxatives for weight loss (8.3% vs 0.0%, $p < 0.001$), having the feeling of being fat (85.1% vs 38.6%, $p < 0.001$), and being on a diet (24.0% vs 9.3%, $p < 0.001$) and the possibility of having EDs. These results are consistent with those of earlier research in Italy (35) and England (36).

Stress as a risk factor has been found to be positively associated with developing EDs. This study reported that overeating during stressful periods (50.7% vs 22.1%, $p < 0.001$) was statistically significantly associated with the risk of EDs. The study participants were asked to identify their behaviours when they felt stressed. Most reported that sleeping (48.8%) and overeating (41.4%) were commonly deployed responses. The results of the multivariate analysis showed that overeating during stressful periods (OR=2.50, 95% CI, 1.47 to 4.30, $p < 0.001$) was strongly associated with being at risk of EDs. Hence, patients with EDs could be especially vulnerable to stress and its effects (37). Chronic stress and mental illness are highly linked to the development of EDs. The relationship between stress and EDs is partially mediated by psychological comorbidity (38). Hence, family physicians may play a significant role in identifying these diseases and coordinating a multidisciplinary team of psychiatrists, dietitians, and other experts to treat eating disorder patients effectively.

Conclusions

This study screened the risk of EDs among adolescents who visit PHCCs in Makkah. It found that 55.4% of adolescents are at risk of developing anorexia and bulimia nervosa. Being overweight and obese, having a history of EDs, using laxatives for weight loss, having the feeling of being fat, being on a diet, and overeating during stressful periods are factors associated with an increased risk of suffering EDs. The Ministry of Education and Ministry of Health must work together to undertake awareness and educational programs in schools and universities as well as implement preventive programmes in primary healthcare settings to avoid the negative consequences of EDs.

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