

Prevalence and Correlates of Depressive Symptoms among Medical Students: a Cross-sectional Single-centre Study

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Abstract

Background: Depressive symptoms are common among medical students. The aim of the present study was to determine the prevalence and risk factors of depressive symptoms among medical students in Sultan Qaboos University in Oman.

Method: A cross-sectional study was conducted among a random sample selected from 1041 medical students at Sultan Qaboos University, Oman. The Patient Health Questionnaire-9 (PHQ-9) was used to screen for depressive symptoms. A logistic regression model was used to determine risk factors for depressive symptoms.

Results: Of 197 medical students selected, 189 (61 men and 128 women) responded. The PHQ-9 results showed that the prevalence of depressive symptoms was 41.3%. In multivariate analysis, female students were more likely than male students to develop depression (adjusted odds ratio = 2.866, $p = 0.004$). Medical students with a family history of depression were more likely to develop depression than those without a family history of depression (adjusted odds ratio = 4.150, $p = 0.014$).

Conclusion: Depressive symptoms are common among medical students in Sultan Qaboos University. Risk factors for depressive symptoms are female sex and family history of depression.

Key words: Depression; Oman; Patient Health Questionnaire; Students, medical

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Introduction

Psychological distress among college students is increasingly recognised.¹ However, depressive symptoms among medical students often go unrecognised, compared

to the general population.² This ‘silent epidemic’ has been reported in medical schools in Gulf Cooperation Council countries.³ A meta-analysis reported that the prevalence of depressive symptoms among medical students in Gulf Cooperation Council countries was higher than the international trend.⁴ Moreover, these medical students have the highest dropout rate.⁵ In Oman, approximately 17% of medical students have depressive symptoms.⁶ The present study aimed to determine the prevalence and risk factors of depressive symptoms among medical students in Sultan Qaboos University in Oman.

Methods

This study was approved by the Ethics Committee of the College of Medicine at Sultan Qaboos University Hospital (MREC#893) and was conducted from August to December 2015. At the time of the study, there were 1041 medical students from all six academic years at the College of Medicine and Health Sciences of Sultan Qaboos University.⁷

Based on the 17% prevalence of depression among medical students in Sultan Qaboos University,⁶ the minimum sample size to have a power level of 80% was calculated as 171, with a type-1 error of 5% ($\alpha = 0.05$) and significance level of 95%. Students were selected at random using a software randomizer; a sample of 197 was generated to allow for non-responses. Because stress level may differ among medical student year-groups,⁸ the present

cohort was categorised as either pre-clinical (years 1 to 4) or clinical (years 5 to 6).

The outcome measure was the self-administered Patient Health Questionnaire-9 (PHQ-9). The PHQ-9 contains items adopted from the DSM-IV and aids in the diagnosis of depressive symptoms and their severity. It has been psychometrically validated in different settings (including primary, secondary, and tertiary), cultures, and samples. Its performance was comparable to that of doctor-administered scales in diagnosing depression. In a validation study in Oman, a cut-off score of ≥ 10 had a likelihood ratio of 10 for a positive test result.⁹ In the present study, the same cut-off score was used for the presence of depressive symptoms. A total score of 10 to 14 was considered moderate depression, 15 to 19 moderately severe depression, and 20 to 27 severe depression, in accordance with the DSM-IV.

Those with or without depression were compared using Chi-squared test or Fisher's exact test for categorical variables. Associations between sociodemographic and clinical variables and the presence of depression were determined using univariate and multivariate analyses. Variables associated with depression in the univariate analysis were entered into a stepwise backward logistic regression model to determine the correlates of depression and to adjust for confounders. A two-tailed significance level was set at 0.05. Statistical analysis was carried out using SPSS (Windows version 22.0; IBM Corp, Armonk [NY], United States).¹⁰

Results

Of 197 medical students selected, 189 (61 men and 128 women) responded (Table 1). Of them, 94% were single; 75.7% were preclinical students and 24.3% were clinical students. 93.7% has never diagnosed with depressive disorder. 90.5% had no family history of depressive disorder. 97.9 % has never used alcohol or opiates. According to PHQ-9 results, the prevalence of depressive symptoms was 41.3%.

In univariate analysis, female sex ($p = 0.01$), previous diagnosis with depression ($p = 0.03$), and a family history of depression (0.01) were risk factors for depression among medical students (Table 2).

In multivariate analysis, female students were more likely to develop depression than male students (adjusted odds ratio = 2.866, 95% confidence interval = 1.403-5.854, $p = 0.004$, Table 3). Medical students with a family history of depression were more likely to develop depression than those without a family history of depression (adjusted odds ratio = 4.150, 95% confidence interval = 1.335-12.905, $p = 0.014$, Table 3).

Discussion

In a meta-analysis of 167 studies from 43 countries involving 116 628 people, the prevalence of depression and depressive symptoms was 27.2%.⁸ In Oman, the prevalence has ranged

Table 1. Sociodemographic variables of medical students ($n = 189$)

Variable	No. (%) of participants
Sex	
Male	61 (32.3)
Female	128 (67.7)
Marital status	
Single	179 (94.7)
Married	8 (4.2)
Divorced	2 (1.1)
Residence	
Living with family	62 (32.8)
Staying on campus	89 (47.1)
Living in a rented apartment / house	38 (20.1)
Year of study	
Pre-clinical	143 (75.7)
Clinical	46 (24.3)
Have you ever diagnosed with depressive disorder?	
No	177 (93.7)
Yes	12 (6.3)
Do you have a family history of depression disorder?	
No	171 (90.5)
Yes	18 (9.5)
Have you ever used substances such as alcohol and opiates?	
No	185 (97.9)
Yes	4 (2.1)

from 11.4%⁶ to 27.7%.⁷ In Saudi Arabia, the prevalence was 46.2% to 48.2%.¹¹ In United Arab Emirates, the prevalence was 28.6%.¹² In Bahrain, 19%¹³ to 40%¹⁴ of medical student were reported to have depressive symptoms. In the present study, the prevalence of depressive symptoms was 41.3%. The discrepancy could be due to case ascertainment bias, heterogeneity in the methodology, the healthcare system, and cultural differences.⁸ Arab culture discourages expression of emotion. The PHQ-9 is designed to solicit the 'cognitive' aspect of depression rather than 'somatic' types, which are rife as idiom of distress in Arab populations. Nonetheless, the present study indicated that depression is rife among medical students in terms of the PHQ-9, consistent with a meta-analysis of 77 studies involving 62 728 medical students that suggested that depressive symptoms are more common among medical students in Gulf Cooperation Council countries than elsewhere.⁴

In multivariate analysis, female students had higher odds of having depressive symptoms, consistent with previous studies on the general and college populations.^{4,8}

Table 2. Univariate analysis for risk factors of depression

Variable	No. (%) of participants		p Value
	No depression	Depression	
Sex			0.011
Male	44 (72.1)	17 (27.9)	
Female	67 (52.3)	61 (47.7)	
Marital status			0.947
Single	105 (58.7)	74 (41.3)	
Married	5 (62.5)	3 (37.5)	
Divorced	1 (50.0)	1 (50.0)	
Residence			0.408
Living with family	38 (61.3)	24 (38.7)	
Staying on campus	48 (53.9)	41 (46.1)	
Living in a rented apartment / house	25 (65.8)	13 (34.2)	
Year of study			1.000
Pre-clinical	84 (58.7)	59 (41.3)	
Clinical	27 (58.7)	19 (41.3)	
Have you ever diagnosed with depressive disorder?			0.030
No	108 (61.0)	69 (39.0)	
Yes	3 (25.0)	9 (75.0)	
Do you have a family history of depression disorder?			0.010
No	106 (62.0)	65 (38.0)	
Yes	5 (27.8)	13 (72.2)	
Have you ever used substances such as alcohol and opiates?			0.308
No	110 (59.5)	75 (40.5)	
Yes	1 (25.0)	3 (75.0)	

Table 3. Multivariate analysis for predictors of depression (Patient Health Questionnaire-9 score of ≥ 10).

Variables	B	Adjusted odds ratio (95% confidence interval)	p Value
Sex			
Male (ref)			
Female	1.053	2.866 (1.403-5.854)	0.004
Have you ever diagnosed with depressive disorder?			
No (ref)			
Yes	0.358	1.430 (0.080-25.453)	0.808
Have you ever been prescribed treatment for a depressive disorder?			
No (ref)			
Yes	1.411	4.099 (0.223-75.232)	0.342
Do you have a family history of depression disorder?			
No (ref)			
Yes	1.423	4.150 (1.335-12.905)	0.01

Family history of depression also plays a significant role in the development of depressive symptoms, consistent with a meta-analysis that supports temporal relationship between

depressive symptoms and family history of depressive illness.¹⁵ In previous studies in Gulf Cooperation Council countries, determinants of depressive illness included

burnout, year of study, sex, relationship with peers, and academic performance.^{11,16}

This study has several limitations. First, the study was cross-sectional, so the results cannot be used to isolate the cause and effect. Second, self-administered checklists are inferior to gold-standard interview. Third, other factors were not explored such as socioeconomic status, contact with family and/or relatives, academic performance, history of re-sitting examinations or repeating, and history of self-harm. Future studies should use a more robust methodology, and other potentially modifiable factors should be investigated.

Conclusion

Depressive symptoms are common among medical students in Sultan Qaboos University. Risk factors for depressive symptoms are female sex and family history of depression.

Declaration

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