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Depressive Symptoms Among Students of Sultan Qaboos University, Oman: A Cross-sectional Study

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ABSTRACT

Objectives: To examine the prevalence, characteristics, causes, and contributing factors of depression among university students to aid in the management of this condition through the identification of root causes and influencing factors. ***Methods***: This cross-sectional study surveyed students enrolled in various colleges of Sultan Qaboos University, Muscat, between 1 September and 20 November 2023. Depressive symptoms were assessed using the self-report Patient Health Questionnaire-9. ***Results:*** Out of a total of 1036 participants, 349 had depression, revealing a prevalence rate of 33.7%. Most depressed students were female (n = 261, 74.8%) and lived on campus (n = 210, 60.2%). Depression was significantly more prevalent among female students ($p < 0.001$) and among those residing on campus ($p = 0.028$). The highest rate of depression was observed among students in the Colleges of Science (39.9%), Engineering (38.5%), and Agriculture and Marine Sciences (36.8%). There was no significant association between academic grade point average and depressive symptoms ($p = 0.462$). ***Conclusions:*** Over one-third of Sultan Qaboos University students had depressive symptoms, which was more prevalent among female students and those residing on campus, though an over representation of women in university housing confounds the latter association. Further research, especially in collaboration with other educational institutions, is recommended to assess the nationwide prevalence, identify vulnerable groups, and develop effective treatment strategies.

Depressive disorder is a mental health issue characterized by persistent feelings of sadness and/or a marked loss of interest or pleasure in activities.[1] It is globally recognized as a major contributor to disability, adversely affecting the affected individual's emotions, cognition, and actions, as well as personal and familial relationships. Notably, over half of all suicides are directly linked to depression.[2] In 2015, approximately 4.4% of the global population—over 320 million individuals—experienced depression.[3]

Depression is shaped by multiple factors including environmental influences. In 2020, the prevalence of depression increased by 27.6% due to the widespread impact of the COVID-19 pandemic, making it the second most severe community health condition worldwide.[4] Demographic factors including family structure, loss of loved ones, smoking habits, education, and employment status also play a part—with young women affected the most.[5,6] A large pan-European survey reported higher rates of depression in women compared to men (except in Finland and Croatia).[7] A Canadian study reported that being married was associated with lower depression in older men but not in women.[8] A Taiwanese study found that physical activity was linked to lower levels of depression in both genders regardless of marital status, with the most benefit observed among unmarried women.[9]

It has been known for decades that university students experience higher levels of depressive symptoms. For example, a 1987 American study reported a depression prevalence of 33% among college students.[10] More recent studies in Spain, Turkey, the UAE, and Canada have revealed a prevalence of 18.4–34.2% among university students.[11–15] Students' academic performance is known to be impacted by emotional difficulties, as reflected in their grade point averages (GPA).[13,16] There is also an association with

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physical fatigue and depression. In the US, college students who self-reported moderate-to-severe fatigue were also likely to report severe depressive symptoms.[17] Additionally, medical students more frequently exhibit symptoms of depression than their non-medical peers and the general population, as found by a comprehensive meta-analysis of 132 studies from 43 countries.[18]

Prior research based on 2009 data revealed that 27.7% of students enrolled at SQU, the largest public university in Oman, were affected by depression.[19] This study aimed to provide updated insights into the prevalence and characteristics of depressive symptoms among students at SQU in the post-COVID-19 era, a period marked by increased mental health challenges among Omani youth.[20] The objectives were: (1) to determine the prevalence of depressive symptoms among SQU students; (2) to identify the sociodemographic and academic characteristics of affected students; and (3) to examine correlations between depressive symptoms and academic performance. The findings are intended to provide data to help policymakers design suitable mental health interventions for Omani students, especially since many students in the Middle Eastern region tend to avoid professional help.[21]

METHODS

This cross-sectional study was conducted at SQU from 1 September 2023 to 20 November 2023. The target population consisted of all enrolled students from various colleges on the campus. To minimize confounding factors, students with chronic health conditions or those currently taking prescribed medication for any reason were excluded. The minimum required sample size was calculated to be 377 students (out of 15000 at SQU), based on a 95% CI and a 5% margin of error. To account for potential attrition, 123 participants were added, raising the target sample size to 500. A convenience sampling approach was employed, and participants were recruited through invitations sent via university email and in-class announcements. Ultimately, 1036 students participated and completed the survey.

Ethical approval was granted by the Ethics Committee of the Sultan Qaboos University Hospital (Ref. SQU-EC/119/2023 (MREC# 3039). All respondents provided written informed consent before participating.

A self-reported questionnaire was used for data collection. The first part gathered general demographic information, including age, gender, academic year, college, residential status, and GPA. The second part consisted of the Patient Health Questionnaire-9 (PHQ-9), a self-administered screening tool for depressive symptoms, and is based on the Primary Care Evaluation of Mental Disorders (PRIME-MD) instrument.[22] The PHQ-9 is usually utilized in primary care settings for reliably assessing and tracking symptoms of depression of varying severity in various populations, including Oman, and is considered comparable to lengthier professional assessments.[19,23–25]

The PHQ-9 tool evaluates the 9-symptom criteria of depression as indicated in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), including low mood/hopelessness, loss of interest/pleasure, loss of energy, sleeping difficulties, feelings of worthlessness/guilt, changes in appetite, feelings of being restless/slow, difficulties concentrating, and thoughts about suicide.[23] Each symptom is scored on a 4-point Likert scale in terms of frequency from 0 ('not at all') to 3 ('almost daily'), with total scores ranging from 0 to 27.[23] For the present study, a total PHQ-9 score of ≥ 12 was considered to indicate symptoms of depression. Students with high PHQ-9 scores indicative of depressive symptoms were referred to the SQU Student Clinic for further evaluation and management.

Data analysis was conducted using SPSS Statistics (IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.) and Microsoft Excel. The sociodemographic characteristics of the study sample were presented using descriptive statistics. Categorical variables were described as frequencies and percentages and continuous variables as means and SDs. Either Pearson's chi-squared test or Fisher's exact test (for values < 5) was employed to assess the relationships between independent variables and the outcome variable. Significance level was set at $p \leq 0.050$.

RESULTS

A total of 1036 SQU students participated in the survey, comprising 701 (67.7%) female and 335 (32.3%) male students, with a mean age of 20.4 ± 1.7 (range = 18–25) years. Based on the PHQ-9 cut-off scores of ≥ 12, 349 (33.7%) students endorsed

symptoms of depression. Table 1 presents associations between the frequency of symptoms of depression and various demographic and academic factors.

Depressive symptoms were significantly more prevalent among females than males (74.8% vs. 25.2%; $p < 0.001$). Additionally, students with symptoms of depression were significantly more likely to live on campus than outside (60.2% vs. 39.8%; $p = 0.028$).

In terms of academic factors, a higher proportion of students with symptoms of depression were found in the College of Science (39.9%), College of Engineering (38.5%), and College of Agriculture and Marine Sciences (36.8%). No statistically significant association was found between symptoms of depression and choice of college ($p = 0.104$). Regarding academic level (year of study), 35.5% of students with depressive symptoms were in their first or second year, 31.8% in their third or fourth year, and 34.7% in their fifth year or beyond; these distributions were not significantly different from those of students without depressive symptoms ($p = 0.511$). Concerning academic performance, 32.3% of students with depressive symptoms had a GPA of 2–3, 34.4% had > 3, and 39.2% had < 2. No significant association was found between GPA and depressive symptoms ($p = 0.462$).

Table 1: Associations between depression and selected demographic and academic characteristics among students attending Sultan Qaboos University, Muscat, Oman (N = 1036).

Characteristic	Total students n (%) (N = 1036)	Students with depression n (%) (n = 349)	Students without depression (n = 687)	*p*-value
Gender				< 0.001
Male	335 (32.3)	88 (26.3)	247 (73.7)	
Female	701 (67.7)	261 (37.2)	440 (62.8)	
Marital status				0.434
Single	1015 (98.0)	340 (33.5)	675 (66.5)	
Married	20 (1.9)	9 (45.0)	11 (55.0)	
Divorced	1 (0.1)	0 (0.0)	1 (100)	
Widowed	0 (0.0)	0 (0.0)	0 (0.0)	
Residence				0.021
On campus (male = 6; female = 550)	556 (53.7)	210 (37.8)	346 (62.2)	
Off campus (male = 329; female = 151)	480 (46.3)	139 (29.0)	341 (71.0)	
With family	257 (24.8)	75 (29.2)	182 (70.8)	
With friends	188 (18.1)	53 (28.2)	135 (71.8)	
Alone	35 (3.4)	11 (31.4)	24 (68.6)	
Academic level, year				0.511
1–2	338 (32.6)	120 (35.5)	218 (64.5)	
3–4	450 (43.4)	143 (31.8)	307 (68.2)	
≥ 5	248 (23.9)	86 (34.7)	162 (65.3)	
College				0.104
Agriculture and Marine Sciences	76 (7.3)	28 (36.8)	48 (63.2)	
Arts and Social Sciences	99 (9.6)	34 (34.3)	65 (65.7)	
Economics and Political Science	70 (6.8)	21 (30.0)	49 (70.0)	
Education	153 (14.8)	53 (34.6)	100 (65.4)	
Engineering	96 (9.3)	37 (38.5)	59 (61.5)	
Law	41 (4.0)	11 (26.8)	30 (73.2)	
Medicine and Health Sciences	217 (20.9)	55 (25.3)	162 (74.7)	
Nursing	71 (6.9)	25 (35.2)	46 (64.8)	
Science	213 (20.6)	85 (39.9)	128 (60.1)	
GPA				0.462
< 2	74 (7.1)	29 (39.2)	45 (60.8)	
2–3	532 (51.4)	172 (32.3)	360 (67.7)	
> 3	430 (41.5)	148 (34.4)	282 (65.6)	

GPA: grade point average.

DISCUSSION

The main aim of this study was to investigate the prevalence of symptoms of depression among college students at SQU and the associated factors. We found symptoms of depression in 33.7% of the surveyed SQU students using the PHQ-9 screening tool. This rate is higher than the findings from a recent international systematic review and meta-analysis, which revealed an overall prevalence of 24.4% in 76 608 university students in 20 low- and middle-income countries.[26] Compared to previous research in SQU, our findings suggest that the frequency of symptoms of depression among SQU college students has increased by 6% over the last 12-year period (27.7% vs. 33.7%).[19]

Several factors may explain the increased prevalence, such as greater mental health awareness, reduced stigma, and increased academic pressures. In addition to those were the repercussions of the COVID-19 pandemic, which caused significant disruptions to the daily lives of college students worldwide, due to remote learning, social isolation, and economic hardships, worsening or precipitating depressive symptoms.[27]

We found that the symptoms of depression were significantly higher among women than among men (37.2% vs. 26.3%; p <0.001). Studies in Iceland and Portugal have reported twice the rates of depression among women compared to men.[7] However, the low prevalence of depressive symptoms in male students in our study could also be partly related to under-detection by the PHQ-9, as males are less likely to report depressive symptoms, possibly due to cultural norms of masculinity and reluctance to express emotions.[28,29]

Although a higher proportion of our married students reported symptoms of depression (45.0%) compared to their unmarried peers (33.5%). On the other hand, a Chinese study suggested that unmarried young adults face greater psychological distress compared to those who are married;[30] however, such differences warrant cautious interpretation across cultural settings. Furthermore, our research found that most unmarried students reported feeling isolated and lacking emotional support, which may contribute to higher rates of depression symptoms. However, any comparisons between married and unmarried students in our study were not considered significant due to the extremely small percentage of married participants (1.9%).

In our study, female students showed a higher depression prevalence (37.2% vs. 26.3%; p < 0.001). Symptoms of depression were significantly more common among students living on campus compared to those off campus (37.8% vs. 29.0%; p = 0.028). However, this association is confounded by gender, as most students residing on campus are women.

This pattern aligns with findings from a recent multi-campus survey in China, where both female gender and campus living independently predicted depressive symptoms, though the association between residence and mental health diminished after adjusting for gender.[31] Moreover, a large longitudinal study from Shanghai, China, reported that female students had significantly higher rates of depression, even after accounting for living conditions.[32] Further, a convenience sample of university students in Saudi Arabia found that women were more likely to report depressive symptoms than men regardless of their residence.[33] Taken together, while campus living appears associated with higher depression, this likely reflects the gender-based housing distribution rather than an independent effect of residence.

Various studies have reported conflicting association between the year of study and depression among college students. Research in South Africa found higher levels of depressive symptoms among first-year students.[16] Conversely, Malaysian and Chinese studies reported more depression among senior students, attributed to heavier course loads in senior years.[34,35] In our study, although students with symptoms of depression were more frequently in their third or fourth year of study (41.0%), a larger proportion of depressed students relative to total enrollment in that academic category was actually observed among first and second year students (35.5%); however, this association was not statistically significant (p = 0.511).

We also found that SQU students with symptoms of depression were more likely to be enrolled in scientific and medical colleges, but the association was not significant. Interestingly, our medical students endorsed a lower level of depression compared to their peers in other science colleges, which contradicts many studies that link medical programs with higher rates of depression.[18,21,36]

Notably, only 8.3% of our respondents reported GPAs < 2.0. This finding diverges from previous studies, which have generally found a correlation between depression and poor academic grades.[13] This

discrepancy may suggest the involvement of additional variables in the relationship between depression and poor academic performance among SQU students. A potential confounder is the possibility that students with low GPAs may not accurately disclose this information. Future studies should address this bias. A recent study in the US found that students who experienced depressive symptoms at the beginning of the academic year had lower GPAs in the first semester and were more likely to drop out two years later.[37]

This study has several limitations. First, PHQ-9 is primarily a monitoring tool rather than a diagnostic instrument, designed to assess the severity of depression in already-diagnosed individuals. It is meant to be administered by clinicians, not self-administered, and our results should be interpreted in this context. Second, the study did not assess family income, which is a key confounding factor in mental health research.[38] Third, the convenience sampling method used may have introduced a selection bias, as students who were more available or willing to participate may differ psychologically from those who did not respond. This may also partially explain the lower-than-expected prevalence of depressive symptoms among SQU medical students. Fourth, we did not stratify our analysis by gender across variables such as academic performance, college affiliation, or residence status. This limited the study's ability to identify whether specific subgroups—such as female students in particular colleges or to those certain GPA category—might be at greater risk. Future research should include such stratified analysis.

The high prevalence of depressive symptoms among SQU college students is compounded by the fact that many affected students do not seek professional help.[21] Given the increasing global and local prevalence of depression among students, we recommend more detailed studies to identify contributing factors. Moreover, collaboration with other universities and colleges nationwide is advised to comprehensively understand the extent of the issue in Oman and to develop optimal management strategies. We also recommend partnering with student unions and university administration to increase student awareness of depressive symptoms, their academic and social consequences, and the importance of early intervention. Special focus should be given to depression in female students, especially campus residents. All institutes of higher education in Oman must strengthen their counseling and support systems to provide accessible, timely, and effective assistance to students in need.

CONCLUSION

This study brings out the high prevalence (33.7%) of symptoms of depression in a large sample of college students in Oman, marking a notable increase compared to earlier research, underscoring the urgent need for mental health interventions. Female students were significantly more affected, suggesting gender as a strong predictor of depression. Factors such as increased mental health awareness, higher academic pressures, and the disruptive effects of the COVID-19 pandemic are also potential contributors to this trend. These findings emphasize the need for proactive and gender-sensitive mental health strategies to enhance the quality of life and academic success of SQU students.

Disclosure

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