Original Article

Anxiety and Depression Screening in Egyptian University Students: Prevalence and Predictors

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Abstract

Background: Depressive and anxiety disorders are among the leading causes of burden of disease worldwide with prevalence estimates and disability weights comparatively higher than many other diseases among university students age group. University students are at a developmentally crucial period and are prone to experience variable levels of stresses which can lead to mental health disorders such as anxiety and depression. Identifying the prevalence of these disorders and the associated factors is crucial for prevention and control of these disorders.
Objective(s): The current study was conducted to estimate the prevalence of anxiety and depression and their associated and predicting factors among university students.
Methods: An observational cross-sectional study was conducted in Alexandria and Alamein universities from March till April 2023, where all students at both universities were invited to participate. Data collection was done using a self-administered structured online questionnaire using Google Forms that was divided into 3 parts. The first part was prepared to collect data regarding the sociodemographic characteristics, personal habits, history of chronic diseases and mental illness, family history of mental illness, academic environment and students' perspective towards studying. The second part included the validated Arabic version of The Generalized Anxiety Disorder Assessment (GAD-7) questionnaire, and the third part included the validated Arabic version of the Patient Health Questionnaire-9 (PHQ-9) the depression module. Respondents were asked to rate how often each symptom occurred over the preceding 2 weeks.
Results: Among 2589 valid questionnaires, the overall prevalence of moderate to severe anxiety symptoms were found among nearly half the students (48.4%). Moderate to severe depression symptoms constituted 70%. Predictors that were statistically significantly associated with anxiety symptoms after binary logistic regression were age, sex, faculty type, smoking, history of mental illness, sleeping hours, and time available to study, while predictors of depression symptoms were faculty type and academic year.
Conclusion: Our study suggests that a lot of university students experience depression and anxiety symptoms, and highlighted factors that are related to these mental disorders. Anonymous screening can have an important role in identifying students with mental disorders overcoming stigma that prevents them from seeking help.

Keywords: Depression; anxiety; university students; prevalence; associated factors, predictors

INTRODUCTION

Depressive and anxiety disorders are among the leading causes of burden of disease worldwide (ranked 4th and 6th leading causes of disability adjusted life years (DALYs), respectively among the age group 10-24 years), with prevalence estimates and disability weights comparatively higher than many other diseases. The persistently high prevalence of these disorders is especially concerning, because they not only impair different aspects of health whether physical or mental, but also increase the risk of other health outcomes, such as suicide (rated as the 18th leading cause of mortality worldwide).[1]

University students are a key population determinant for the economic growth and prosperity. Until recently, little attention was paid to identifying and managing mental disorders among university students.[2] These students are prone to experience variable levels of stresses during their higher education [3], which can lead to mental health disorders such as anxiety and depression, that can affect their academic performance, quality of life and ability to practice.[4] Various studies worldwide showed that prevalence rates of anxiety and depression symptoms among university students differ greatly from lower

prevalence rates of 28.5% and 21.8% in Australia, to higher rates of 88.4% and 75.0% in Pakistan for anxiety and depression respectively.[5, 6]

Multiple risk factors associated with anxiety and depression among undergraduate university students in developed and developing countries were identified. These factors can be categorized into multiple themes including psychological, academic, biological, lifestyle, social and financial.[7] To explore the associated factors could help to reduce the anxiety and depression symptoms among university students, as most of these associated factors are modifiable. In addition, associated factors could also be used to better identify university students at higher risk for depression and anxiety symptoms even when those factors are not modifiable.[8]

University years are a developmentally crucial period for young people in which they transition from late adolescence to emerging adulthood. These years (typically 17 to 24) are a peak period for the onset of mental disorders.[9] Yet students have a low ability to know when and where to seek help and develop competencies designed to improve their mental health and self-management capabilities.[10] Improvement of the ability of problem recognition could be done through mental health screening.[11]

It is important to identify the prevalence and risk factors of anxiety and depression among overall university students not just on specific subgroups. In Egypt, to the best of the authors' knowledge, there are very little studies that address this problem among all university students. This study aims to estimate the prevalence of anxiety and depression and their associated and predicting factors among university students.

METHODS

An observational cross-sectional study was conducted in Alexandria (public) and Alamein (national) universities. Data collection was done from March till April 2023.

The prevalence of anxiety and depression symptoms was assumed to be 50% for calculating the sample size. By using a design effect of 2, a confidence level of 95%, and a margin of error of 5%, the minimum required sample size was 764. Considering the non-response rate, the sample size was increased by 80%. So, the minimum required sample size was 1375. The sample size was calculated using EpiInfo version 7.2.

All students of the two universities were invited to participate in the study. Data was collected over two months. The duration would have been extended if the minimum required sample was not fulfilled during this period.

Data collection tools

Data collection was done using a self-administered structured questionnaire that was divided into 3 parts. The first part was prepared to collect data regarding the sociodemographic characteristics, personal habits, history of chronic diseases, family history of mental illness, academic environment and students' perspective towards studying. The second part included the validated Arabic version of The Generalized Anxiety Disorder Assessment (GAD-7) questionnaire, which is a brief measure for symptoms of anxiety, based on the generalized anxiety disorder diagnostic criteria described in the Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV). It is a seven-item instrument that is used to measure or assess the severity of generalized anxiety disorder (GAD). It is also used for screening. [12,13] The third part included the validated Arabic version of the Patient Health Questionnaire-9 (PHQ-9) -the depression module- which contains 9 items from the DSM-IV used in the diagnosis and screening of depression.[14,15] For the two questionnaires, each item is evaluated on a severity scale ranging from 0 to 3 where the respondent is asked to rate how often each symptom occurred over the preceding 2 weeks. Response options include "not at all", "several days", "more than half the days" and "nearly every day", yielding a total score ranging from 0-21 for the GAD-7 and 0-27 for the PHQ-9. For GAD-7 scores of 0-4 are interpreted as minimal anxiety (which is considered normal). While for PHQ-9 scores of 1-4 were interpreted as minimal depression 5-9 as mild anxiety,10-14 as moderate anxiety, and a score greater than 15 as severe anxiety. [12,13] While for PHQ-9 scores of 1-4 were interpreted as minimal depression (which is considered normal); 5-9 as mild depression.; 10-14 moderate depression; 15-19 moderately severe depression; and 20-27 severe depression. [14,15] For simplification we considered moderately severe depression and severe depression as severe depression. The questionnaire was distributed as online Google Forms to screen the enrolled students for anxiety and depression, who responded anonymously to these forms.

After data analysis students who scored positive for anxiety or depression were contacted through the psychological support unit in the two universities which reached them through their given e-mails to inform them about their scores. Those with a score of mild anxiety or depression were advised to monitor their symptoms and follow up through these units, while those with a score of moderate to severe levels of anxiety or depression were advised further assessment for treatment if required, based on recommendations by Spitzer et al. [12, 14]

Statistical analysis

Data entry was done using Excel 2016 and analyzed using Statistical Package for Social Science (SPSS) program version 25. Descriptive quantitative data were represented by measures of central tendency and measures of dispersion. Z test was used to compare the 95% Confidence Intervals. Odds ratio (OR) was used to quantify the strength of the association between two events. The binary logistic model was used to estimate the probability of a binary response of the outcome (e.g. Depression) based on one (univariate, OR) or more (multivariate, AOR) predictor variables (features).[12] The calibration was assessed by directly comparing the observed and customized predicted outcome across subcategories of risk. The Hosmer–Lemeshow goodness-of-fit test was employed, where a p value >0.10 indicates acceptable calibration. Statistical significance was tested at p value <0.05.

Ethical considerations

The study was approved by the Ethical committee of Faculty of Medicine, Alexandria University. The cover page in the electronic survey explained the purpose of the study, and it also included consent which was in the form of a question where the participants were asked whether they were willing to participate in the study.

RESULTS

Participants characteristics

All students of Alexandria and Alamein universities (201,850 participants: 200,000 Alexandria University, 1,850 Alamein University) were invited to participate in the study. A total number of 2731 questionnaires were submitted, out of which 2589 questionnaires were valid i.e. 96.7% (2589 participants: 2117 (81.8%) from Alexandria University and 472 (18.2%) from Alamein University).

Females represented 61.2%, and 59.5% compared to males who constituted 38.8%, and 40.5% in Alexandria and Alamein universities respectively. Students from different majors were categorized into two categories: Basic, applied sciences and technology together with medical and health sciences (75.3%: 75.0% and 75.4% Alexandria and Alamein universities respectively) and social sciences and humanities (24.7%: 24.7% and 24.6%, Alexandria and Alamein universities respectively). Most students in Alexandria University were not expatriated (87.0%) opposite to Alamein University where 65.7% were expatriated. About half the sample reported having chronic diseases (48.5%: 48.2% and 49.6%, Alexandria and Alamein universities respectively). Nearly three quarters (73.8%) reported previous history of mental illness (27.0%, and 22.7%, Alexandria and Alamein universities respectively) while nearly one third (31.3%) reported family history

of mental illness (31.3%, and 31.6% Alexandria, and Alamein universities respectively). Regarding lifestyle habits: most students (71.1%) did not practice daily religious worship (73.8% and 58.9%, Alexandria, and Alamein universities respectively), and never smoked (84.0%: 84.7% and 80.5%, Alexandria and Alamein universities respectively). More than half the students (51.0%) reported not having enough sleeping hours (more in Alamein (61.5%) compared to Alexandria University (48.7%)). Around two thirds of the students (65.2%) reported using the internet more than 4 hours per day (64.7% and 67.4%, Alexandria and Alamein universities respectively), and having insufficient time to study (60.0% and 63.1%, Alexandria and Alamein universities respectively). Detailed description of the participants' characteristics is shown in Table 1.

Prevalence of anxiety and depression and their association with the sample characteristics.

The overall prevalence of anxiety symptoms among valid questionnaires was 77.0%, with a slightly higher distribution in Alamein University (79.4.%) compared to Alexandria University (76.5%). The mean score of anxiety symptoms was 9.82 (SD ± 6.2) for Alexandria University, and 10.2 (SD ± 6.1) for Alamein University with no statistically significant difference between the two universities. As regards severity of anxiety symptoms, in the overall study sample as well as in both universities, the prevalence of all levels of severity were nearly similar, with a slightly higher prevalence of mild anxiety symptoms as 28.6% (28.7% and 28.0%, Alexandria and Alamein universities respectively). This is followed by severe then moderate levels of anxiety as 25.6% and 22.8% giving a total of 48.2% (Alexandria: 25.4%, and 22.4%, Alamein: 27.0%, 24.6% for severe and moderate anxiety symptoms respectively). (Table 2)

The overall prevalence of depression symptoms was 91.1%, with a nearly equal distribution among the two universities (91.2% and 90.7% in Alexandria and Alamein respectively). The mean score of depression was 13.6 (SD ± 6.8) for Alexandria University, and 13.9 (SD ± 6.8) for Alamein University with no statistically significant difference between the two universities. Moderate depression symptoms were more prevalent, as 47.7% for the total study sample (Alexandria: 47.0% and Alamein: 51.1%) while mild and severe levels of depression symptoms were about one fifth, as 21.1% and 22.3% (Alexandria University: 22.3%, and 22.0%, Alamein University: 15.9%, 23.6% for mild and severe depression symptoms respectively). (Table 2)

It was also shown that students who had both symptoms of anxiety and depression combined were 1824 constituting 70.5% of students of both universities (Alexandria University: 57.1%, and Alamein University:13.4%).

Table 1: Distribution of studied university students according to their sociodemographic and other characteristics

Characteristics	Alexandria University (n=2117)* No. (%)	Alamein University (n=472)* No. (%)
Age (years)		
18 to <21	1131 (53.4%)	366 (77.5%)
21 to <23	986 (46.6%)	106 (22.5%)
Sex		
Male	821 (38.8%)	191 (40.5%)
Female	1296 (61.2%)	281 (59.5%)
Faculty type		
Basic, applied sciences and technology + medical and health sciences	1594 (75.3%)	356 (75.4%)
Social sciences and humanities	523 (24.7%)	116 (24.6%)
Academic year		
3rd or above	901 (42.6%)	151 (32.0%)
1st and 2nd	1216 (57.4%)	321 (68.0%)
Expatriation		
No	1843 (78.1%)	162 (34.3%)
Yes	274 (12.9%)	310 (65.7%)
Daily religious worship		
No	1562 (73.8%)	278 (58.9%)
Yes	555 (26.2%)	194 (41.1%)
Smoking		
Never	1794 (84.7%)	380 (80.5%)
Ever	323 (15.3%)	92 (19.5%)
Grades		
Failure	32 (2.2%)	18 (5.9%)
Success	1432 (97.8%)	288 (94.1%)
Previous year grade		
Failure	1312 (97.6%)	269 (93.7%)
Success	32 (2.4%)	18 (6.3%)
Chronic disease		
No	1096 (51.8%)	238 (50.4%)
Yes	1021 (48.2%)	234 (49.6%)
History of mental illness		
No	572 (27.0%)	107 (22.7%)
Yes	1545 (73.0%)	365 (77.3%)
Family History of mental illness		
No	1455 (68.7%)	323 (68.4%)
Yes	662 (31.3%)	149 (31.6%)
Internet usage hours		
Not of daily basis	61 (2.9%)	2 (0.4%)
< 2 hours	93 (4.5%)	21 (4.5%)
2-4 hours	582 (27.9%)	129 (27.7%)
>4 hours	1349 (64.7%)	314 (67.4%)
Fast food/week		
< 2 times	764 (39.0%)	153 (36.5%)
2-4 times	764 (39.0%)	174 (41.5%)
>4 times	429 (21.9%)	92 (22.0%)
Sleeping hours		
Enough	1081 (51.3%)	180 (38.5%)
Not enough	1027 (48.7%)	287 (61.5%)
Working + studying		
No	1463 (69.2%)	429 (91.3%)
Yes	650 (30.8%)	41 (8.7%)
Time available to study		
Sufficient	841 (39.9%)	173 (36.9%)
Deficient	1266 (60.1%)	296 (63.1%)

*Percentages in each variable were calculated from valid responses only

Factors that were significantly associated with anxiety in the crude analysis were nearly the same in both universities (Alexandria and Alamein). These were age, sex, faculty type (Alexandria), religious worship (Alexandria), smoking (Alexandria), history of mental illness, family history of mental illness, sleeping hours, and time available to study. (Table 3)

In the binary logistic regression analysis, stepwise regression was fit including variables that were statistically significant in the crude analysis. The final binary logistic model based on multivariate predictors indicated that age, sex, college type, smoking (Alexandria), history of mental illness, sleeping hours, and time available to study were the factors significantly associated with anxiety (p<0.5). Lower odds of anxiety were found among students who were 18 to less than 21 years (in Alamein University:

AOR= 0.48, 95% CI= 0.23-0.97), while higher odds of anxiety were found among students who were females (Alexandria University: AOR= 1.37, 95% CI= 1.08-1.75, Alamein University: AOR=2.47, 95% CI= 1.44-4.235), affiliated to humanistic faculty type (Alexandria University: AOR= 1.41, 95% CI= 1.055-1.89), ever smokers (Alexandria University: AOR= 1.505, 95% CI 1.06-2.14), with a history of mental illness (Alexandria University: AOR= 4.24, 95% CI=3.335-5.39, Alamein University: AOR=4.34, 95%CI 2.53-7.44), with insufficient/not enough sleeping hours (Alexandria University: AOR= 2.08, 95% CI=1.64-2.63, Alamein University: AOR=2.26, 95% CI=1.34-3.80), and who did not have sufficient time to study (Alexandria University: AOR=1.70, 95% CI=1.35-2.135, Alamein University: AOR=2.05, 95% CI= 1.22-3.45). (Table 3)

Table 2: Distribution of studied university students according to levels of anxiety and depression

	Total (n=2589) No. (%)	Alexandria University (n=2117) No. (%)	Alamein University (n=472) No. (%)
Anxiety symptoms			
Symptoms within normal	595 (23.0%)	498 (83.7%)	97 (20.5%)
With positive symptoms:	1994 (77.0%)	1619 (76.5%)	375 (79.5%)
Mild	740 (28.6%)	608 (28.7%)	132 (28.0%)
Moderate	590 (22.8%)	474 (22.4%)	116 (24.6%)
Severe	664 (25.6%)	537 (25.4%)	127 (27.0%)
Depression symptoms			
Symptoms within normal	231 (8.9%)	187 (8.8%)	44 (9.3%)
With positive symptoms:	2358 (91.1%)	1930 (91.2%)	428 (90.7%)
Mild	547 (21.1%)	472 (22.3%)	75 (15.9%)
Moderate	1234 (47.7%)	993 (47.0%)	241 (51.1%)
Severe	577 (22.3%)	465 (22.0%)	112 (23.6%)

Factors that were significantly associated with depression in the crude analysis were faculty type, being in the first and second years, as well as not having enough sleeping hours (Alamein University: OR= 3.023 (1.9082-4.7894), p=<.0001), and deficient time to study (Alamein University: OR= 2.6699 (1.6922-4.2125), p=<.0001). In the binary logistic regression analysis, stepwise regression was fit including variables that were statistically significant in

the crude analysis. The final binary logistic model based on multivariate predictors indicated only two predictors of depression and these were faculty type where higher odds were found among students who belonged to humanistic faculties in Alexandria University (AOR = 1.87, 95%CI 1.28-2.735), and academic year where students who were in the first and second academic years in Alamein University (AOR =2.18, 95% CI= 1.15-4.15). (Table 4)

Table 3: Associated factors and predictors of anxiety symptoms among the studied university students

Anxiety	Alexandria University		Alamein University	
	OR (95% CI), P-value	AOR (95% CI), P-value	OR (95% CI), P-value	AOR (95% CI), P-value
Age (years)				
18 to <21	1.3178 (1.0754-1.6148), p=.0078*	0.844 (0.703-1.112), p=.293	0.4693 (0.2501-0.8806), p=.0185*	0.477 (0.234-0.972), p=.042*
21 to <23 (Ref)	1	1	1	1
Sex				
Male (Ref)	1	1	1	1
Female	1.6267 (1.3278-1.9928), p<.0001*	1.373 (1.079-1.747), p=.0101*	2.8583 (1.8053-4.5253), p<.0001*	2.469 (1.439-4.235), p=.001*
Faculty type				
Basic, applied sciences and technology + medical and health sciences (Ref)	1	1	1	1
Social sciences and humanities	0.1737 (0.1179-0.2558), p<.0001*	1.413 (1.055-1.892), p=.020*	1.2279 (0.7182-2.0993), p=.4531	1.173 (0.638-2.156), p=.607
Academic year				
3rd or above (Ref)	1	1	1	1
1st and 2nd	1.0444 (0.8527-1.2792), p=0.6747	1.016 (0.808-1.278), p=.893	1.1901 (0.7432-1.9057), p=.4688	1.022 (0.589-1.773), p=.938
Expatriation				
No (Ref)	1		1	
Yes	1.1094 (0.8273-1.4877), p=.4880	---	1.2887 (0.7947-2.0898), p=.3038	---
Religious worship				
No	0.1065 (0.0839-0.1353), p=<.0001*	0.955 (0.722-1.262), p=.744	0.5081 (0.3859-0.6690), p=.3709	1.058 (0.620-1.807), p=.836
Yes (Ref)	1		1	1
Smoking				
Never (Ref)	1	1	1	1
Ever	1.4497 (1.0717-1.9610), p=.016*	1.505 (1.057-2.142), p=.023*	1.0077 (0.5740-1.7692), p=.9786	1.058 (0.541-2.069), p=.869
Grades				
Failure	1.6490 (0.6301-4.3157), p=.3082	---	1.2882 (0.3610-4.5973), p=.6964	---
Success (Ref)	1		1	
Previous year grade				
Failure	1.5939 (0.6085-4.1750), p=.3427	---	1.2269 (0.3426-4.3927), p=.7534	---
Success (Ref)	1		1	
Chronic disease				
No (Ref)	1		1	
Yes	1.0019 (0.8195-1.2249), p=.9854	---	1.1632 (0.7439-1.8189), p=.5074	---
History of mental illness				
No (Ref)	1	1	1	1
Yes	5.2916 (4.2618-6.5702), p=<.0001*	4.240 (3.335-5.389), p=<.0001*	5.9351 (3.6436-9.6675), p= <.0001*	4.341 (2.532-7.443), p<.0001*
Family History of mental illness				
No (Ref)	1	1	1	1
Yes	0.1349 (0.1060-0.1717), p=<.0001*	1.214 (0.926-1.592), p=.161 NS	2.1788 (1.2635-3.7555), p=.0051*	1.590 (0.860-2.940), p=.139 NS
Internet Use				
Not of daily basis (Ref)	1		1	
On daily basis	1.0634 (0.5884-1.9217), p=.8387	---	1.3094 (0.0623-27.5009), p=.8622	---
Sleeping hours				
Enough (Ref)	1	1	1	1
Not enough	12.4727 (1.9994-3.0582), p<0001*	2.079 (1.643-2.631), p=<.0001*	3.0231 (1.9082-4.7894), p<.0001*	2.259 (1.344-3.796), p=.002*
Working + studying				
No	1.1871 (0.9580-1.4710), p=.1170		1.0898 (0.5017-2.3674), p=.8279	---
Yes (Ref)	1	---	1	
Time available to study				
Sufficient (Ref)	1	1	1	1
Deficient	2.1998 91.7941-2.6973), p<.0001*	1.695 (1.346-2.135), p=<.0001*	2.6699 (1.6922-4.2125), p<.0001*	2.049 (1.216-3.454), p=.007*

*Significant at p < 0.05; Only predictors that were statistically significant in the univariate analysis were included in the multivariate analysis
Odd Ratio (OR); Adjusted Odds Ratio (AOR); Confidence Interval (CI); Reference Group (Ref); Not statistically significant (NS)

Table 4: Associated factors and predictors of depression symptoms among studied university students

Depression	Alexandria University		Alamein University	
	OR (95% CI)	AOR (95% CI)	OR (95% CI)	AOR (95% CI)
Age (years)				
- 18 to <21	1.1489 (0.8509–1.5513), p=.3650	1.087 (0.820-1.441), p=.563	1.3364 (0.6013-2.9700), p=.4767	0.675 (0.293-1.553), p=.355
- 21 to <23 (Ref)	1	1	1	1
Sex				
- Male (Ref)	1	1	1	1
- Female	1.0628 (0.7823-1.4439), p=.6968	1.176 (0.872-1.587), p=.289	1.6950 (0.9095-3.1590), p=.0967	1.697 (0.854-3.373), p=.131
Faculty type				
Basic, applied sciences and technology + medical and health sciences (Ref)	1	1	1	1
Social sciences and humanities	2.0497 (1.3462-3.1207), p=.0008*	1.872 (1.282-2.735), p=.001*	1.2963 (0.6035-2.7844), p=.5058	1.306 (0.595-2.868), p=.506
Academic year				
3rd or above (Ref)	1	1	1	1
1st and 2nd	1.1173 (0.8227-1.5173), p=.4775	1.045 (0.789-1.385), p=.758	2.0930 (1.1187-3.9157), p=.0208*	2.179 (1.146-4.147), p=.018*
Expatriation				
No (Ref)	1	---	1	---
Yes	1.3461 (0.8227-2.2025), p=.2367 NS		1.3654 (.7246-2.5728), p=.3353 NS	
Religious worship				
No	1.0928 (0.7812-1.5286), p=.6045	0.847 (0.619-1.159), p=.299	1.0088 (0.5367-1.8962), p=.9782	1.081 (0.552-2.118), p=.820
Yes (Ref)	1	1	1	1
Smoking				
Never (Ref)	1	1	1	1
Ever	1.0246 (0.6729-1.5600), p=.9099	0.979 (0.663-1.446), p=.914	1.4280 (0.6923-2.9454), p=.3348	0.766 (0.349-1.682), p=.506
Grades				
Failure	1.4095 (0.3329-5.9684), p=.6411 NS	---	1.9333 (0.5262-7.1039), p=.3208 NS	---
Success (Ref)	1		1	
Previous year grade				
Failure	1.4137 (0.3335-5.9925), p=.6385	---	1.8692 (0.5074-6.8857), p=.3471	---
Success (Ref)	1		1	
Chronic disease				
No (Ref)	1		1	
Yes	1.0528 (0.7794-1.4221), p=.7374	---	1.0850 (0.5830-2.0184), p=.7968	---
History of mental illness				
No (Ref)	1	1	1	1
Yes	1.1714 (0.8432-1.6274), p=.3455	1.119 (0.812-1.541), p=.492	1.3145 (00.6517-2.6511), p=.4449	1.052 (0.494-2.240), p=.895
Family History of mental illness				
No (Ref)	1	1	1	1
Yes	1.2353 (0.8829-1.7283), p=.2175	1.174 (0.854-1.614), p=.322	1.2554 (0.6273-2.5126), p=.5205	1.144 (0.556-2.356), p=.715
Internet Use				
Not of daily basis (Ref)	1		1	
On daily basis	1.0303 (0.7105-1.4940), p=.8750	---	1.3094 (0.0623-27.5009), p=.8622	---
Sleeping hours				
Enough (Ref)	1	1	1	1
Not enough	1.0034 (.8867-1.1355), p=.4019	1.071 (0.807-1.423), p=.633	3.023 (1.9082-4.7894), p=<.0001*	1.288 (0.659-2.516), p=0.459
Working + studying				
No	1.0068 (0.8807-1.1510), p=.92028	---	1.0898 (.5017-2.3674), p=.8279	---
Yes (Ref)	1		1	
Time available to study				
Sufficient (Ref)	1	1	1	1
Deficient	1.0127(.8927 –1.1489), p=.844	0.917 (0.683-1.230), p=.562	2.6699 (1.6922-4.2125), p=<.0001*	1.174 (0.598-2.307), p=.641

*Significant at p < 0.05; Only predictors that were statistically significant in the univariate analysis were included in the multivariate analysis
Odd Ratio (OR); Adjusted Odds Ratio (AOR); Confidence Interval (CI); Reference Group (Ref); Not statistically significant (NS)

DISCUSSION

To our knowledge some previous studies have assessed the mental health of undergraduate students. However, most studies have tended to focus on medical students and have largely ignored university students in other fields including studies conducted in Egypt. Our study explored the prevalence of anxiety and depression symptoms, their associated factors and predictors among all over undergraduate university students.

This study revealed that the prevalence of depression symptoms was higher than anxiety symptoms. The overall prevalence of depression symptoms was 91.1%, with a nearly equal distribution among the two universities (91.2%, and 90.7% in Alexandria University, and Alamein University, respectively), whereas the overall prevalence of anxiety symptoms among the total population was 77.0%, with a slightly higher distribution in Alamein University (79.4.%) compared to Alexandria University (76.5%). Our results are in line with but higher than the results of other studies conducted in Egypt showing prevalence of anxiety and depression symptoms respectively to be 82.6% and 88.8% in 2020 in Benha [16], and 78.4% and 63.3% in 2014 in Menoufiya [17] among medical students. Similarly other studies showed 88.4% and 75.0% in Pakistan [6]. Other studies showed lower rates as 28.5% and 21.8% in Australia [5] for anxiety and depression respectively. These findings are also higher than the findings of a meta-analytic study published in 2022 where the prevalence of anxiety and depression symptoms were 39.0% and 33.6% respectively where it was shown that the prevalence of anxiety and depression symptoms was higher in studies conducted after the coronavirus disease 2019 (COVID-19) outbreak. [8]

It is especially important to know the severity levels of whether depression or anxiety symptoms to be able to give the students proper advice. Those with mild levels of symptoms are advised to monitor their symptoms and follow up, while those with scores of moderate to severe levels of symptoms are advised further assessment for treatment if required. [12,14]

Regarding severity of depression symptoms, the current study showed that moderate and severe level depression symptoms constituted a total prevalence of 70.0%. The overall prevalence of moderate level depression symptoms constituted 47.7% (Alexandria University: 47.0%, and Alamein University: 51.1%), while severe level constituted 22.3% (Alexandria University: 22.0%, Alamein University: 23.6%). On the other hand, mild depression symptoms were shown among around one fifth of the students as 21.1% (Alexandria University: 22.3%, Alamein University: 15.9%). This goes in accordance with a study conducted in Pakistan where moderate depression was the most prevalent at a rate of 35.8%, while mild

depression represented 16.0% and severe levels represented 23.2%.[6] These results were different from the results of studies conducted in Benha, Egypt where severe levels of depression symptoms were the most prevalent at rate of 55.8%, followed by moderate level (23.6%) then mild level (9.4%).[16]

Regarding severity of anxiety symptoms, the current study showed that the overall prevalence of all levels of severity were nearly similar, with a slightly higher overall prevalence of mild anxiety symptoms of 28.6% (Alexandria University: 28.7%, Alamein University: 28.0%). Moderate and severe levels of anxiety symptoms constituted nearly half the sample (48.4%), where moderate and severe levels of anxiety symptoms represented 22.8% and 25.6% of the students (Alexandria University: 22.4% and 25.4%, Alamein University: 24.6% and 27.0% for moderate and severe levels of anxiety symptoms respectively). This is different from the results of the study conducted in Pakistan and Benha, Egypt, where mild anxiety represented the least prevalence (4.4%, 12.1% respectively) , while severe anxiety levels constituted the highest prevalence (64.6%, 57.1%, respectively), and moderate anxiety represented 19.4% and 13.4%, respectively.[6, 16]

Variation in depression and anxiety symptoms rates might be in part due to the difference in the data collection tools used in different studies. For both depression and anxiety, the rates of the current study are more consistent with the rates reported for medical students in various studies as mentioned above. The higher prevalence of depression and anxiety in our study may be in part explained by the tendency of those who have health problems whether physical or mental problems to explore their problems by responding to questionnaires more than those who do not have problems.

Different studies reveal that various factors are associated with anxiety and depression symptoms among undergraduate university students as sociodemographic characteristics for example, age, gender, residence, family income, type of faculty, and academic class, other personal characteristics as presence of chronic physical or mental illness among students or their relatives, lifestyle characteristics as failure and habits as sleep, physical activity, engagement with the internet, and academic characteristics as psychological, academic, biological, lifestyle, social and financial.[7, 8] Our study revealed that the only factors that were incriminated were age, sex, faculty type, smoking (Alexandria University only), history of mental illness, sleeping hours, and time available to study for anxiety symptoms; while for depression symptoms these factors were faculty type (in Alexandria University), and academic years (Alamein University). On the other hand, our study showed no significant association between the rest of

the factors with anxiety and depression symptoms which differed from most of the aforementioned studies.

As regards age, being younger was found to be protective against anxiety symptoms, where lower odds of anxiety were found among students who were 18 to less than 21 years old (AOR= 0.48). This is contradictory to findings of other studies in Australia, where students of lower academic years were more likely to be anxious. [18] It was also revealed that there were higher odds of depression symptoms among students who were in the first and second academic years (Alamein University: AOR=2.18, 95% CI= 1.15-4.15) compared to other academic years. This goes in line with other studies that stated that being in lower-academic years significantly increases the odds of depression symptoms among students. [19]

This might be explained by difficulty experienced by younger groups adjusting to university life, social isolation (living apart from their families) and lack of friends as major risk factors for depression. [20] This might be more prominent among Alamein University students as 65.68% of them were expatriated and live apart from their families.

The current study also showed a significant gender difference where the odds of anxiety symptoms were higher among females compared to males (Alexandria University: AOR=1.37, Alamein University: AOR= 2.47) this is consistent with the results of two previous studies in Egypt, [16, 17] although their population of study were medical students. Other studies showed no significant gender differences for anxiety as in Australia.[5]

As for the faculty type, the current study revealed that students affiliated to faculties of social sciences and humanities studies had higher odds of anxiety symptoms (Alexandria University: AOR= 1.41, 95% CI= 1.055-1.89) and higher odds of depression symptoms (Alexandria University: AOR= 1.87, 95% CI=1.28-2.735) compared to those affiliated to faculties of Basic, applied sciences and technology together with medical and health sciences in Alexandria University. Our results are in line with the results of a study conducted in Tokyo where students who major in psychology and philosophy, are more likely to develop depression during their studies compared to others.[21] These results are contradictory to most global studies as in a met-analysis conducted by Wenzhen which reveal that the odds of anxiety and depression among medical students are much higher than among non-medical students [8] and also contradicts the results of another study conducted in Egypt in Zagazig where prevalence of anxiety, depression among the students in the faculty of Pharmacy were higher than among the students in faculty of Arts (58%, 53%, compared to 38.5%, 33.5%, respectively).[22] In our study the higher

prevalence of anxiety and depression symptoms among students of social sciences and humanities faculty types could be attributed in part to having more time to answer the online questionnaires compared to those of Basic, applied sciences and technology together with medical and health sciences faculties, as well as this might be explained by that students who have underlying mental health conditions are more likely to choose certain subjects such as philosophy, psychology. [21]

It was also shown that among Alexandria University students the odds of anxiety symptoms were higher among those who were ever smokers (AOR= 1.505). This is in line with many other studies such as in Malaysia. [23]

Our study revealed higher odds of anxiety symptoms among students who had a history of mental illness in both universities (Alexandria University: AOR= 4.24, 95% CI=3.335-5.39, Alamein University: AOR=4.34, 95%CI 2.53-7.44). This is similar to findings of other studies where it was found that pre-existing poor mental health was a strong predictor of anxiety and depression symptoms in university students in a meta-analytic study.[24]

In both universities, students with insufficient sleep had above twice the odds of anxiety symptoms (Alexandria University: AOR= 2.08, 95% CI=1.64-2.63, Alamein University: AOR=2.26, 95% CI=1.34-3.80) compared to those who had sufficient sleep. Other studies showed similar results as revealed by a meta-analytic study where poor sleep quality was associated with anxiety with pooled OR=1.7 with a minimum OR= 1.39 to a maximum of 2.15.[1]

Findings of the current study also revealed higher odds of anxiety symptoms among those who did not have sufficient time to study (Alexandria University: AOR=1.70, 95% CI=1.35-2.14, Alamein University: AOR=2.05, 95% CI= 1.22-3.45). This goes in accordance with studies that reported that anxiety in students can be attributed to several study related factors such as intensity of the degree program, demanding utmost dedication, amount of content to be studied, and other factors as small semesters with pressure of time. [25]

Limitations of the study

The study findings should be interpreted with care as using a Google form and responding to the questionnaire was not obligatory, so only a percent of the students at both universities responded and there was difference in the response rates of each variable in the questionnaires. Those who responded probably had personal interest in the questionnaire, therefore those participants cannot be considered representative of the whole students' population of both universities, yet this does not underestimate the problem. Secondly, the study utilized a self-report methodology that might

have affected the outcomes through some biases such as social desirability and memory recall.

CONCLUSION AND RECOMMENDATIONS

Our study suggests that a lot of university students experience depression and anxiety symptoms. Moderate to severe anxiety symptoms were found among nearly half the students (48.4%), where moderate to severe depression symptoms were found among 70% of the students. Factors that are related to these mental disorders were highlighted. Predictors of anxiety were age, sex, faculty type, smoking, history of mental illness, sleeping hours, and time available to study, while predictors of depression were faculty type and academic year. Anonymous screening can have an important role in identifying students with mental disorders overcoming stigma that prevents them from seeking help. For better learning and functioning of students in universities, it is crucial to start effective promotion, prevention, and intervention strategies for mental disorders.

CONFLICT OF INTEREST
The authors have no conflict of interest to declare.

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