The prevalence of depression, anxiety, and stress among a sample of first-year medical students

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Background
Stress in medical education has become a global phenomenon. The excessive working hours, competitive academic environment, lack of recreational activities, lack of peer support, staying away from home, and financial problems are common reasons of depression, anxiety, and stress in medical schools. The objective of this study is to examine the prevalence of depression, anxiety, and stress among a group of Egyptian medical school students from the Faculty of Medicine, Pharmacy, and Dentistry (100 students from each).

Patients and methods
A structured self-generated questionnaire was used for identifying demographic and social characteristics and risk factors of psychological illness among those students, and also the Arabic short version of the standardized Depression Anxiety Stress Scale 42 was applied.

Results
The students of Faculty of Medicine showed the highest percent of depression (96%), anxiety (98%), and stress (76%), whereas the students of faculty of pharmacy showed lower percent of depression (70%), anxiety (81%), and stress (59%). Most medical students (medicine 42%, pharmacy 33%, and dentistry 41%) had moderate depressive symptoms, whereas 34% of students of Faculty of Medicine had severe depressive symptoms and 45% of them had extreme anxiety. Most of the students came from rural areas and lived outside home away from their families.

Conclusions
The high prevalence of depression, anxiety, and stress symptoms among medical students is alarming. This shows the need for primary and secondary prevention measures, with the development of adequate and appropriate support services for this group.

Keywords:
Al Azhar University (Girls), anxiety, Depression Anxiety Stress Scale 42, dentistry, depression, Egypt, first year, medical students, pharmacy, stress

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Introduction

Stress in medical students is caused by strenuous medical programs, which may have physical and psychological effects on the well-being of medical students. Large number of medical students experience anxiety disorders because of the long-term effects of stress, exuding through emotional and behavioral symptomatology (Barikana, 2007).

Medical students are overloaded with a huge amount of information with limited time to memorize all the information studied, creating a feeling of disappointment as they struggle with their own capacity to meet the demands of medical curriculum (Yussof and Baba, 2013).

Evidence suggesting that university students are vulnerable to mental health problems has generated increased public concern in the Western societies (Stanley and Manthorpe, 2001). Previous studies suggest high rates of psychological morbidity, especially depression and anxiety, among medical students all over the world (Aktekin *et al.*, 2001; Dyrbye *et al.*, 2006; Bilgel, 2008; Goebert *et al.*, 2009; Schwenk *et al.*, 2010; Bayram and Ibrahim *et al.*, 2013; Mata *et al.*, 2015; Rueckert, 2016).

Studies have also proved that medical students are more likely to have suicidal thoughts than students from other schools (Rotenstein *et al.*, 2016).

Female medical students may respond to the stress with stronger manifestations of anxiety. Physiological,

psychological, and behavioral stressors are found to be related to the metabolic changes of the body (Rizvi *et al.*, 2010).

Patients and methods

Participants

Approval for the study was provided by the institutional review committee. All participants were recruited directly after their respective classrooms during the fourth week of the academic year. Verbal informed consent was obtained, and students willing to participate filled out the questionnaires. As students replied anonymously, it was clear that they would not face any repercussions if they decided not to participate. A total of 300 students (100 students from medicine and the same number from pharmacy and dentistry) at Al Azhar University for Girls in Cairo, Egypt, filled out the Arabic version of 42-item Depression Anxiety and Stress Scale (DASS) and a questionnaire prepared by the authors concerning their sociodemographic details.

Methods

We conducted a structured self-generated questionnaire for identifying demographic and social characteristics and risk factors of psychological illness among this population of students, which could be related to social, demographic, behavioral, and/or academic causes (El-Gilany *et al.*, 2008).

Moreover, the Arabic short version of the standardized DASS, which is a 42-item questionnaire, was used.

Study patients

We selected a random sample from the first-year university students from Faculty of Medicine, Pharmacy, and Dentistry at Al Azhar University for Girls at Cairo.

Respondents had basic education, were young, had not been in any specialized training, and thus, were unlikely to have an exposure to depression before.

Instrument and assessment

Data were collected by administrating two self-administered questionnaires.

The first is a structured self-generated questionnaire for identifying demographic and social characteristics and risk factors of psychological illness among this population of students, which could be related to social, demographic, behavioral, and/or academic causes (El-Gilany *et al.*, 2008).

The second is the Arabic short version of the standardized DASS, which is a 42-item questionnaire; it is a set of three self-report scales designed to identify the presence and measure severity of the negative emotional states of depression, anxiety, and stress, with seven items per scale (Lovibond and Lovibond, 2014). The DASS was constructed not merely as another set of scales to measure conventionally defined emotional states but to further the process of defining, understanding, and measuring the ubiquitous and clinically significant emotional states, usually described as depression, anxiety, and stress. The DASS should thus meet the requirements of both researchers and scientist-professional clinicians (Crawford and Henry, 2003). It is suitable for screening normal adolescents and adults. Each of the three DASS scales contains 14 items, divided into subscales of two to five items with similar content. The depression scale assesses dysphoria, hopelessness and devaluation of life, self-deprecation, lack of interest/involvement, anhedonia, and inertia.

The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious effect. The stress scale is sensitive to levels of chronic nonspecific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive, and impatient. Patients are asked to use four-point severity/frequency scales to rate the extent to which they have experienced each state over the past week. Scores for depression, anxiety, and stress are calculated by summing the scores for the relevant items (Crawford and Henry, 2003).

The Arabic version of the DASS scale shows that the scale paragraphs' correlation factor (DASS) wholly correspond to statistically significant in the level of 0.01; this indicates that the scale (DASS) is internally coherent. The reliability factor for the whole scale (DASS) was 0.94 by using Cronbach's alpha factor, split-half reliability factor was 0.87, which indicates that the scale is fit and suitable for the Arabic environment (AlZahrani, 2019).

Data collection and interpretations

The data were analyzed by specific statistics programs such as Med Calc and Statistical Package for the Social Sciences 16.4.3. version (MedCalc Statistical Software version 16.4.3, MedCalc Software bv, Ostend, Belgium; https://www.medcalc.org; 2016).

Data were described as mean±SD for quantitative (numerical) variables to measure the central tendency of data and the distribution of data around their mean

and as frequency and percentage for qualitative (categorical) variables.

χ^2 test was used to test statistically significant relation between different classifications or grades (qualitative data) or percentages.

Correlations were summarized using Pearson correlation coefficients.

An interrater agreement statistic (Kw, weighted Kappa) was used to evaluate the qualitative agreement between the two-dimensional integrative method and its components in determining the degree of severity of MR.

Results

The total number of participants was 300 female students (100 students from each medical college). The mean age of the participants was 18 years old (17–19 years). All were singles. Most students were from rural areas (73% for medicine, 75% for pharmacy, and 67% of dentistry) and lived outside their home (71% for medicine, 72% for pharmacy, and 67% for dentistry). Most of them have satisfactory family income (97% for both medicine and pharmacy and 96% for dentistry). Most of the students came from large families, with more than six members (59% for medicine, 62% for pharmacy, and 56% for dentistry). Most of their fathers were employees (70% for medicine, 64% for pharmacy, and 59% for dentistry). Most of their fathers had received higher education (66% for medicine, 62% for pharmacy, and 56% for dentistry). Only some mothers had received higher education (57% for medicine, 46% for pharmacy, and 35% for dentistry). Moreover, most of them worked outside home (60% for medicine, 54% for pharmacy, and 54% for dentistry).

None of the students reported previous psychiatric illness (Table 1).

Students of the Faculty of Medicine showed the highest percent of depression (96%), anxiety (98%), and stress (76%), whereas the students of faculty of pharmacy showed the lowest percentage of depression (70%), anxiety (81%), and stress (59%) (Table 2).

The severity distribution of depression among students shows that most students have moderate depression (42% for medicine, 33% for pharmacy, and 41% for dentistry). However, the distribution of anxiety shows that extreme anxiety was only present in 45% of medicine, whereas severe anxiety is more common in pharmacy and dentistry (29% and 35%, respectively). In addition, distribution of stress shows 36% of the students of Faculty of Medicine had moderate stress, whereas 47% and 41% of students of both Faculties of Pharmacy and Dentistry, respectively, had no stress (Table 3).

Table 1 Sociodemographic data of the studied group of students

	Medicine	Pharmacy	Dentistry
Student residency			
Out of home	71	72	67
With family	29	28	33
Residency			
Urban	27	25	31
Rural	73	75	69
Family income			
Satisfactory	97	97	96
Unsatisfactory	3	3	4
Family size			
Up to 5	41	38	44
6 and more	59	62	56
Father occupation			
Farmer or manual worker	9	8	14
Employee	70	64	59
Trading or business	21	28	27
Father education			
<Secondary	8	9	10
Secondary	26	29	34
>Secondary	66	62	56
Mother education			
<Secondary	11	17	15
Secondary	32	37	50
>Secondary	57	46	35
Mother occupation			
House wife	40	46	46
Work out side home	60	54	54

Table 2 The prevalence of depression, anxiety, and stress in different medical faculties

	Medicine (%)	Pharmacy (%)	Dentistry (%)
Depression	96	70	84
Anxiety	98	81	87
Stress	76	53	59

Discussion

Most studied students were from rural areas (medicine 73%, pharmacy 75%, and dentistry 69%) and lived outside their home. This is because Al Azhar Medical Faculties for Girls are central faculties at Cairo only and have no branches in other governorates. The study revealed that student's residency has significant effect on the prevalence of depression, anxiety, and stress.

Table 3 Comparison between different degrees of depression in different medical faculties

	Medicine (%)	Pharmacy (%)	Dentistry (%)
Depression			
Non	4	30	16
Mild	13	15	21
Moderate	42	33	41
Severe	34	15	15
Extreme	7	7	7
Anxiety			
Non	2	19	13
Mild	2	11	3
Moderate	20	17	25
Severe	31	29	35
Extreme	45	24	24
Stress			
Non	24	47	41
Mild	25	24	30
Moderate	36	19	19
Severe	12	7	7
Extreme	3	3	3

Students from rural areas had more depression, anxiety, and stress than urban ones, as moving from rural to the open urban community obligates students to travel long distance making them susceptible to stress, lost time, ride accidents, inability to maintain daily habits, feeling loneliness, inability to engage in social activities with their families (TTGmice, 2013).

This agrees with a Turkish study that found that students with a rural background were significantly more likely to have elevated depression, anxiety, and stress scores than students who were living in a town or a city (TTGmice, 2013).

In the current study, the prevalence of depression, anxiety, and stress among first-year medical students at Faculties of Medicine, Pharmacy, and Dentistry Al Azhar University for Girls was 96, 70, and 84% for depression, respectively; 98, 81, and 87% for anxiety, respectively; and 76, 53, and 59% for stress, respectively.

Several studies have also reported higher prevalence of psychological problems such as stress, anxiety, and depression among medical students than in general population age-matched peers (Dahlin *et al.*, 2005; Rosenthal and Okie, 2005; Dyrbye *et al.*, 2006).

Moreover, these levels are higher than that of students in other study courses (Al-Dabal *et al.*, 2010).

Prevalence of studied psychological factor was higher in students of medicine than students of pharmacy and dentistry, which may be owing to huge curriculum, long studying years, working late, and affection of social life, such as late marriage, especially for female students.

Moreover, the medical students face stressors specific to medical education in addition to normal stressors of everyday life, which could explain this high prevalence of psychological illnesses among them (Jadoon *et al.*, 2010).

This percentage is higher than that of Inam (2007) (60%) and Khan *et al.* (2006) (70%); both studies used the Aga Khan University Anxiety Depression Scale as a tool for assessment. However, these two studies involved students from all academic years, whereas our study only focused on first-year medical students. Differences in sociodemographic background of participants and the used tool of assessment could also be contributors in this regard.

In another Egyptian study performed in the first-year medical student at Menoufia University, the prevalence of depression, anxiety, and stress was 63.3, 78.4, and 57.8%, respectively (Abdallah and Gabr, 2014).

Moreover, our results were slight higher, because our study included only female students who are more liable to development of anxiety and stress, as females are more likely to report concerns, stress, and have tendency to overreport symptoms (Bayram and Bilgel, 2008).

It is important to identify students who are more vulnerable to mental illnesses. This could help in mitigating the academic pressures in developing stands in medical profession, which requires emotionally deeming training to deal with different aspects of life like death, fear, and human suffering (Takeichi *et al.*, 2001).

Some of the literature studies found higher scores of depression, anxiety, and stress among medical students (Dyrbye *et al.*, 2006). Moreover, Aktekin *et al.* (2001) found the mean depression score among medical students to be higher than the mean depression score among economics and physical education students. However, a Turkish study found that students who were studying social and political sciences had higher depression, anxiety, and stress scores on DASS than those whose major study areas were basic sciences and engineering or medicine, and these results were not owing to mediator factors such as age, study year, and residency (Bayram and Bilgel, 2008).

Studying in English language was significantly related to depression and anxiety among participants in this study, because in Egypt, most of the students were taught in Arabic in high schools (Sebai, 1982).

However, the rationale to continue teaching medicine in English relies mainly on the fact that most scientific academic information in the world is presented in English language (Maher, 1986).

The amount of complexity of material to be learned in first year of medical schools is a major stressor to students. They feel also academic pressure from the frequent examinations in a competitive environment (Vaz *et al.*, 1998).

In addition to learning difficulties, for example, English language, the students are required to learn a great deal of new information in a short period of time owing to the huge studying curriculum before taking exam evaluations. Therefore, they have little to no time to review what they have learned (Yussof and Baba, 2013).

Psychological illness can lead to negative outcomes including impairment in ability to work efficiently, deterioration in relationships, medical school dropout, and other health problems. Great attention to the psychological well-being of medical students is needed (Murray and Lopez, 1996).

The establishment of students' counseling unit in medical schools, promoting student well-being, and providing supportive, preventive, and curative mental health services to enable students to cope up with their new phase of life is recommended.

Medical schools have to encourage students to spend more time on their social lives and provide them with coping tools to overcome stress throughout their medical education. Leisure activities should be incorporated in curriculum to promote better interaction between the students in their medical school.

A national coordinated survey on mental health of newly entrance undergraduate students should be carried out to give baseline data about mental illness among this group of vulnerable adolescent students to facilitate their later follow-up. Absence of baseline data concerning mental status of medical students at the time of their entrance to the medical schools in Egypt sample recruitment from a single public medical college limits the generalizability of results from this study.

Conclusions

The high rates of depression, anxiety, and stress among medical students are alarming, as it affects students' health, development, educational attainment, and quality of life adversely and also has a deteriorating influence on their own families, institutions, and even on other people's lives.

This is a global issue, and no community is immune against this disorder either in developed or developing countries. So it is important to orient students about psychiatric illness and DE stigmatize it so they can unashamed ask for help.

Moreover, they should be trained on stress management techniques, time management, and encourage them to live a healthy lifestyle.

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Conflicts of interest

There are no conflicts of interest.

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