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Depression, anxiety and stress among first year medical students in an Egyptian public university

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ABSTRACT

Medical students repeatedly experience different stresses which render them more vulnerable to psychological problems that may affect their emotional, psychosocial and physical health. This study has been conducted to determine the prevalence of depression, anxiety and stress among first year medical students at Menoufiya University and to identify their associated factors. This was a cross-sectional study where two self administered questionnaires have been used, the first is a structured one for identifying demographic characteristics and risk factors of psychological illness among 1st year medical students, and the second is the Arabic version of Depression Anxiety Stress Scale (DASS21). The participation rate was 90%. The mean age of participants was 18.02 ± 0.26 years, and more than half (52%) were females. The prevalence of depression, anxiety, and stress among students was 63.6, 78.4 and 57.8%, respectively. Symptoms of moderate severity were the predominant among students with the studied psychological illnesses. Multiple social, demographic, behavioral and educational factors have been significantly ($p < 0.05$) associated with most of the studied psychological illnesses, including: gender, residence, perceived socioeconomic standard, feeling loneliness, the inability to share in families' social activities, presence of insomnia and chronic physical illnesses, studying in English language, problems with exams' criteria, lack of communication with staff members, and the organization of lectures' timetable. In conclusion, a substantial proportion of first year medical students had ongoing psychiatric problems that were associated with multiple social, demographic, behavioral, and educational factors. Interventions addressing the mental health of medical students should be initiated.

Keywords: Depression, anxiety, stress, medical students, medical education, Egypt.

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INTRODUCTION

Today, stress in medical education has become a global phenomenon. During the first year, reasons are mainly related to academic and emotional factors while in subsequent years, patient care and physical factors are more remarkable. Generally, 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 anxiety and stress in medical schools (Wolf, 1994).

Medical school environment has been recognized as a stressful one with negative effects on the academic performance, physical, and psychological well beings of the students (Firth-Cozens, 2001). They could be presented with failure to cope in anxious situations, test or performance anxiety, social phobia, and sometimes severe forms of depression and panic disorders (Elzubeir et al., 2010).

Several studies reported higher prevalence of psychological problems such as stress, anxiety, and depression among medical students than in general population and age matched peers (Dahlin et al., 2005; Rosenthal and Okie, 2005). Some explained that by the fact that medical students face unique academic challenges that render them more vulnerable to stress and anxiety than students of other disciplines (Helmers et al., 1997; Schmitter et al., 2008). In Arab countries, three

recent studies from Egypt, Saudi Arabia, and United Arab Emirates reported high rates of anxiety and depression among medical students (El-Gilany et al., 2008; Amr et al., 2007; Carter et al., 2003).

Failure to detect the psychological disorders among medical students may leads to increased mental illness morbidity with undesired effects throughout their careers and lives (Tyssen et al., 2001). Early detection of such problems shortens the duration of the episode and lessens the social impairment in the long term (Pignone et al., 2002).

It is important to identify the prevalence, and risk factors of stress among medical students, which not only affect their health but also their academic achievements at different points of time in their study period (Abdulghani et al., 2011). This study was, therefore, carried out to determine the prevalence of depression, anxiety and stress among first year medical students at Menoufiya University and to identify their associated factors. We believe that focusing on the first year medical students is important; they are a unique population in which transition to college is accompanied by plenty of stressors.

METHODOLOGY

This cross-sectional study has been conducted over the first year medical students at Menoufiya University in the mid of the first semester in the academic year 2012/2013 after talking agreement of the Ethics Committee of Faculty of Medicine. Menoufiya University is an Egyptian public University that was established in 1978, it has two campuses, and the main campus that includes the Faculty of Medicine is located in Shebin El-Kom city, the capital of Menoufiya Governorate, which lies in Nile Delta. The native language in Egypt is Arabic however the teaching language in Medical schools is the English.

All first year medical students (n = 421) have been invited to participate in the study after explaining the purpose of the study, emphasizing that collected data will be strictly confidential, and taking their verbal consents.

Two self administered questionnaires have been used as data collection instruments and distributed over all students in a 45 min class interview, the first is a structured self generated questionnaire for identifying demographic characters and risk factors of psychological illness among this population of students, that could be related to social, demographic, behavioral, and/or academic causes, and the second is the Arabic short version of the standardized Depression Anxiety Stress Scale (DASS) which is a 21 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, seven items per scale (Lovibond and Lovibond, 1995). DASS is suitable for screening normal adolescents and adults. The Depression scale assesses dysphoria, hopelessness, 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 non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive and impatient. This scale was psychometrically validated to the Arabic culture by Taouk et al. (2001).

Three hundred and seventy nine students have returned the completed questionnaires with participation rate of 90%.

Statistical analysis

Data has been collected and entered to the computer using SPSS (Statistical Package for Social Science) program for statistical analysis, (version 17; Inc., Chicago. IL). Two types of statistics have been done: 1) Descriptive statistics; where numerical data was shown as mean, SD, and range, and categorical data has been expressed as frequency and percent. 2) Analytical statistics: where Chi- square test was used to measure association between qualitative variables. Fisher exact test was used for 2×2 qualitative variables when more than 25% of the cells had expected count less than 5. P-value was considered statistically significant when it is less than 0.05. Pie and grouped bar charts have been plotted.

RESULTS

A total number of 379 students have been participated in the study. Their mean age was 18.02 ± 0.26 years with a range of 17-19 years. More than half of participants (52.0%) were females, majority were never married (98.9%), nearly two thirds (69.9%) were resident in rural area, 88.4% were living with their families, and a similar percent perceived their socio-economic standard as moderate (Table 1).

Depression, anxiety and stress have been reported in 63.6, 78.4 and 57.8% of participants respectively (Table 1). Only 8.7% of participants were suffering from single psychological illness, while double and triple concomitant psychological illnesses have been reported in 46.9 and 34.6% of participants, respectively (Figure 1). Symptoms of moderate severity were the predominant among students considered as having depression, anxiety and stress (48.5, 43.6 and 30.1% respectively) (Figure 2).

Table 2 shows the association of the social and demographic factors with the studied psychological morbidities; significant associations have been reported between the presence of depression and gender ($p = 0.002$), residence ($p < 0.001$), perceived socio-economic standard ($p = 0.017$), feeling loneliness ($p = 0.008$), and sharing family in social activities ($p = 0.004$). Anxiety was significantly associated with gender ($p = 0.016$), housing ($p = 0.001$), presence of family support ($p < 0.001$), and presence of family member in health related profession ($p = 0.002$), while stress was significantly associated with gender ($p < 0.001$), residence ($p < 0.001$), perceived socio-economic standard ($p < 0.001$), feeling loneliness ($p = 0.002$), and sharing family in social activities ($p < 0.001$).

Males were found to be more prone to depression than female (53.9% vs. 46.1%), this liability was inverted regarding anxiety and stress, where females were more vulnerable to anxiety and stress than males (55.2% vs. 44.8%) and (62.1% vs. 37.9%), respectively. Students resident in rural areas were more liable to get depressed and distressed than their peers from urban areas (63.5%

Table 1. Demographic and psychological characteristics of the studied group of students.

Studied variables	Total = 379	
	Number	Percent
Gender		
Male	182	48.0
Female	197	52.0
Marital status		
Never married	375	98.9
Ever married	4	1.1
Residence		
Urban	114	30.1
Rural	265	69.9
Perceived socio-economic standard		
Low	14	3.7
Moderate	335	88.4
High	30	7.9
Housing		
With family	335	88.4
University housing	40	10.6
With friends	4	1.1
Considered as having depression by DASS 21		
Yes	241	63.6
No	138	36.4
Considered as having anxiety by DASS 21		
Yes	297	78.4
No	82	21.6
Considered as having stress by DASS 21		
Yes	219	57.8
No	160	42.2

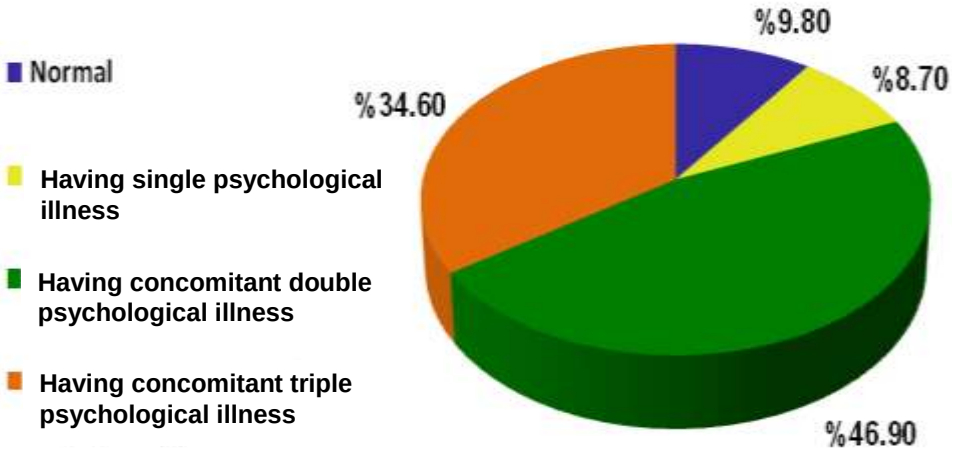

Figure 1. Distribution of students according to studied psychological illnesses.

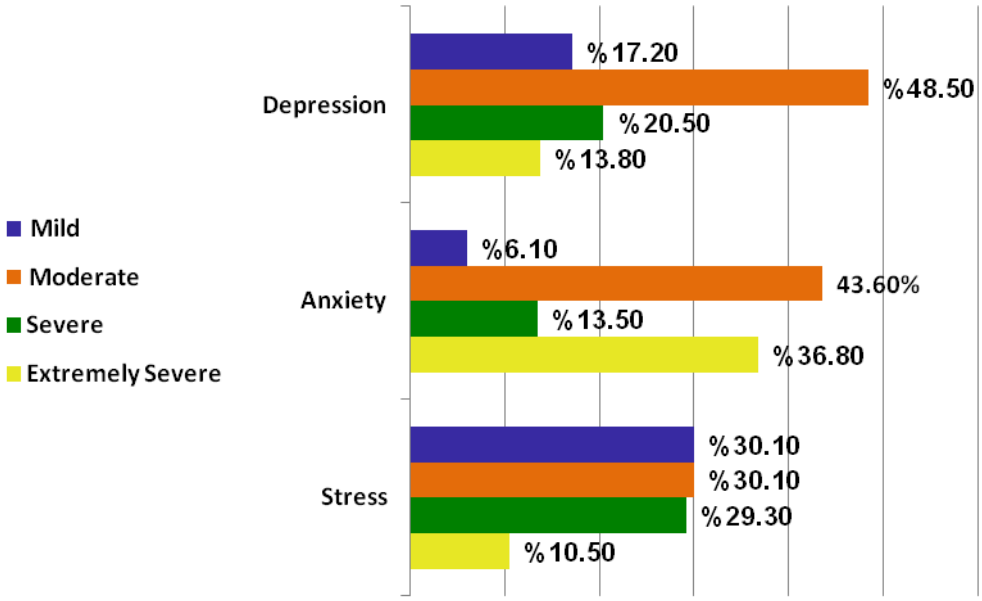

Figure 2. Severity of symptoms among students with the studied psychological illnesses.

vs. 36.5%) and (77.2% vs. 22.8%), respectively (Table 2).

Behavioral and medical risk factors were looked for any existing association with studied psychological morbidities in Table 3. Depression was significantly associated with the frequent drinking of coffee and tea, presence of insomnia (both $p < 0.001$), and presence of chronic physical illness ($p = 0.007$). Stress was associated with presence of chronic physical and psychological illnesses ($p = 0.023$, $p < 0.001$), respectively, while anxiety was associated with only the presence of insomnia ($p < 0.001$). None of participants was reported to be a current smoker.

Different academic factors have been found to be significantly associated with studied psychological morbidities, where the presence of problems with studying in English language was significantly associated with both depression and anxiety ($p = 0.046$, $p = 0.022$) respectively, organization of the lectures' timetable and studying equal or less than four hours/day were significantly associated with anxiety and stress ($p = 0.034$, $p = 0.011$), ($p = 0.020$, $p < 0.001$) respectively, problems in communication with staff was reported to be significantly associated with just stress ($p < 0.001$), and problems with exams' criteria was reported to be significantly associated with just depression ($p = 0.018$). Biochemistry was the most difficult subject in perspective of most of depressed, anxious, and distressed students, 35.3, 36.4 and 46.1%, respectively (Table 4).

DISCUSSION

In current study, the prevalence of depression, anxiety, and stress among 1st year medical students at Menoufiya University was 63.6, 78.4 and 57.8%, respectively. It is well known that medical students are vulnerable to particular challenges and stressors which can impact their psychological state and quality of life (Taha and Sabra, 2012). Globally, medical education has been perceived as stressful in different reports that reveal prevalence rates of stress among medical students ranging from 30 to 50% (Firth-Cozens, 2001; Dahlin et al., 2005; Bayram and Bilgel, 2008). These levels are higher than that of students in other study courses (Al-Dabal et al., 2010). 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).

Anxiety and depression are reliable indicators for assessment of mental illness (Inam et al., 2003). Depression among medical students has been investigated in multiple studies; Inam (2007) reported that prevalence rates of depression among first year female and male medical students in Saudi Arabia were 89.7 and 60% respectively. Jadoon et al. (2010) showed that anxiety and depression prevalence were higher among first year MBBS students in Pakistan and diminishes progressively by fourth year.

Double concomitant psychological illnesses have been reported in 46.9% of students in this study. This percentage, although high, is lower than that of Inam et al. (2003) (60%) and Khan et al. (2006) (70%), both used the Aga Khan University Anxiety and Depression Scale (AKUADS) as a tool for assessment. However these two studies involved students from all academic years and our study only focused on first year medical students. Differences in socio-demographic background of

Table 2. Social and demographic risk factors of depression, anxiety and stress among studied group of students.

Studied variables	Depression n (%)		P-value	Anxiety n (%)		P-value	Stress n (%)		p-value
	Absent n = 138	Present n = 241		Absent n = 82	Present n = 297		Absent n = 160	Present n = 219	
Gender									
Male	52 (37.7)	130 (53.9)	0.002	49 (59.8)	133 (44.8)	0.016	99 (61.9)	83 (37.9)	<0.001
Female	86 (62.3)	111 (46.1)		33 (40.2)	164 (55.2)		61 (38.1)	136 (62.1)	
Residence									
Urban	26 (18.8)	88 (36.5)	<0.001	29 (35.4)	85 (28.6)	0.238	64 (40.0)	50 (22.8)	<0.001
Rural	112 (81.2)	153 (63.5)		53 (64.6)	212 (71.4)		96 (60.0)	169 (77.2)	
Perceived socio-economic standard									
Low	4 (2.9)	10 (4.1)		0 (0.0)	14 (4.7)		14 (8.8)	0 (0.0)	<0.001
Moderate	130 (94.2)	205 (85.1)	0.017	73 (89.0)	262 (88.2)	0.078	137 (85.6)	198 (90.4)	
High	4 (2.9)	26 (10.8)		9 (11.0)	21 (7.1)		9 (5.6)	21 (9.6)	
Housing									
With family	122 (88.4)	213 (88.4)		68 (82.9)	267 (89.9)		143 (89.4)	192 (87.7)	
University housing	16 (11.6)	24 (10.0)	0.285	10 (12.2)	30 (10.1)	0.001	17 (10.6)	23 (10.5)	0.228
With friends	0 (0.0)	4 (1.7)		4 (4.9)	0 (0.0)		0 (0.0)	4 (1.8)	
Friendship problems									
Absent	106 (76.8)	171 (71.0)	0.216	65 (79.3)	212 (71.4)	0.154	124 (77.5)	153 (69.9)	0.098
Present	32 (23.2)	70 (29.0)		17 (20.7)	85 (28.6)		36 (22.5)	66 (30.1)	
Feeling loneliness									
No	118 (85.5)	178 (73.9)	0.008	69 (84.1)	227 (76.4)	0.135	137 (85.6)	159 (72.6)	0.002
Yes	20 (14.5)	63 (26.1)		13 (15.9)	70 (23.6)		23 (14.4)	60 (27.4)	
Sharing in family's social activities									
No	53 (38.4)	130 (53.9)	0.004	35 (42.7)	148 (49.8)	0.251	52 (32.5)	131 (59.8)	<0.001
Yes	85 (61.1)	111 (46.1)		47 (57.3)	149 (50.2)		108 (67.5)	88 (40.2)	
Family support									
Present	23 (16.7)	32 (13.3)	0.367	0 (0.0)	55 (18.5)	<0.001	24 (15.0)	31 (14.2)	0.818
Absent	115 (83.3)	209 (86.7)		82 (100.0)	242 (81.5)		136 (85.0)	188 (85.8)	

Table 2. Continues.

Family member in health related profession									
Absent	81 (58.7)	149 (61.8)	0.548	62 (75.6)	168 (56.6)	0.002	104 (65.0)	126 (57.5)	0.142
Present	57 (41.3)	92 (38.2)		20 (24.4)	129 (43.4)		56 (35.0)	93 (42.5)	

Table 3. Behavioral and medical risk factors of depression, anxiety, and stress among studied group of students.

Studied variables	Depression n (%)		P-value	Anxiety n (%)		P-value	Stress n (%)		p-value
	Absent n = 138	Present n = 241		Absent n = 82	Present n = 297		Absent n = 160	Present n = 219	
Frequent drinking of coffee and tea									
No	98 (71.0)	116 (48.1)	<0.001	46 (56.1)	168 (56.6)	0.940	96 (60.0)	118 (53.9)	0.235
Yes	40 (29.0)	125 (51.9)		36 (43.9)	129 (43.4)		64 (40.0)	101 (46.1)	
Presence of Insomnia									
No	105 (76.1)	130 (53.9)	<0.001	73 (89.0)	162 (54.5)	<0.001	102 (63.8)	133 (60.7)	0.550
Yes	33 (23.9)	111 (46.1)		9 (11.0)	135 (45.5)		58 (36.3)	86 (39.3)	
Presence of chronic physical illness*									
No	138 (100.0)	133 (96.7)	0.007	78 (95.1)	293 (98.7)	0.070	160 (100.0)	211 (96.3)	0.023
Yes	0 (0.0)	8 (3.3)		4 (4.9)	4 (1.3)		0 (0.0)	8 (3.7)	
Presence of chronic psychological illness**									
No	128 (92.8)	233 (96.7)	0.084	78 (95.1)	283 (95.3)	0.951	160 (100.0)	201 (91.8)	<0.001
Yes	10 (7.2)	8 (3.3)		4 (4.9)	14 (4.7)		0 (0.0)	18 (8.2)	

* Examples: Diabetes, bronchial asthma, and juvenile hypertension. **Examples: Schizophrenia, drug addiction, and obsession.

participants, teaching methods, and the used tool of assessment could also be contributors in this regard.

According to the WHO (World Health Organization), it is estimated that mental diseases, including depression, anxiety and stress, will be the second leading cause of disability by the year 2020 (Murray and Lopez, 1996), which evokes the issue of importance of identifying students who are more vulnerable to mental illnesses. This could help in mitigating the academic pressures and in developing standards in medical profession which requires emotionally demanding training to deal with different aspects of life like death, fear, and human suffering (Takeichi and Sato, 2001).

Stress in medical education comes from different sources could be personal, academic, and/or economic circumstances that have negative effect on student's health, personal adjustment and grades (Wolf, 1994).

The results of this study revealed that female students were significantly more anxious and distressed than male students

Table 4. Academic risk factors of depression, anxiety and Stress among the studied group of students.

Studied variables	Depression n (%)		P-value	Anxiety n (%)		P-value	Stress n (%)		p-value
	Absent n = 138	Present n = 241		Absent n = 82	Present n = 297		Absent n = 160	Present n = 219	
Problems with studying in English language									
Absent	63 (45.7)	85 (35.3)	0.046	41 (50.0)	107 (36.0)	0.022	67 (41.9)	81 (37.0)	0.335
Present	75 (54.3)	156 (64.7)		41 (50.0)	190 (64.0)		93 (58.1)	138 (63.0)	
Problems in communication with teaching staff									
Absent	67 (48.6)	106 (44.0)	0.390	42 (51.2)	131 (44.1)	0.252	97 (60.6)	76 (34.7)	<0.001
Present	71 (51.4)	135 (56.0)		40 (48.8)	166 (55.9)		63 (39.4)	143 (65.3)	
Organization of lectures' timetable									
Good	25 (18.1)	42 (17.4)	0.866	8 (9.8)	59 (19.9)	0.034	19 (11.9)	48 (21.9)	0.011
Bad	113 (81.9)	199 (82.6)		74 (90.2)	238 (80.1)		141 (88.1)	171 (78.1)	
Problems with exams' criteria									
Absent	54 (39.1)	66 (27.4)	0.018	31 (37.8)	89 (30.0)	0.177	59 (36.9)	61 (27.9)	0.062
Present	84 (60.9)	175 (72.6)		51 (62.2)	208 (70.0)		101 (63.1)	158 (72.1)	
Average studying hours/day									
≤4 hrs	109 (79.0)	202 (85.2)	0.121	61 (74.4)	250 (85.3)	0.020	107 (66.9)	204 (94.9)	<0.001
>4 hrs	29 (21.0)	35 (14.8)		21 (25.6)	43 (14.7)		53 (33.1)	11 (5.1)	
The most difficult subject from student's perspective									
Physiology	1 (0.7)	32 (13.3)	<0.001	4 (4.9)	29 (9.8)	0.004	1 (0.6)	32 (14.6)	<0.001
Anatomy	55 (39.9)	83 (34.4)		35 (42.7)	103 (34.7)		90 (56.3)	48 (21.9)	
Biochemistry	62 (44.9)	85 (35.3)		39 (47.6)	108 (36.4)		46 (28.8)	101 (46.1)	
Histology	20 (14.5)	41 (17.0)		4 (4.9)	57 (19.2)		23 (14.4)	38 (17.4)	

($p = 0.016$, $p < 0.001$) respectively. This finding is in agreement with that of other studies which indicated that female medical students are more liable for development of anxiety and stress (Amr et al, 2007; Inam, 2007). However, other studies have not reported gender differences in stress perception (Foster-Williams et al., 1996). This difference could be real or due to the fact that females are more likely to report concerns, stress, and their tendency to over report symptoms (Bayram and Bilgel, 2008). Residence in rural areas made students more vulnerable to depression and stress ($p < 0.001$). Moving from rural to the open urban community could be a stressor to students plus absence of recreational facilities in rural areas.

Depressed and distressed students in the current study complained feeling loneliness,

inability to engage in social activities with their families, and reported presence of chronic physical illness in significant level than normal students ($p < 0.05$). Insomnia has been reported by both depressed and anxious students in significant level ($p < 0.001$). Psychiatric illness leads to changes in person's lifestyle. Reported lifestyle changes were a decrease in sleep, leisure and recreational activities (Wolf, 1994).

Studying in English language was significantly related to depression and anxiety among participants in this study ($p = 0.046$, $p = 0.022$) respectively. In Egypt, most of students had studied in Arabic in high schools. The use of native language in teaching medicine could be a way to overcome the linguistic dualism by thinking in one language and studying in another (Sebai, 1982). However the rationale to continue teaching medicine in English relies mainly on the fact that majority of the scientific and academic information in the world is presented in English language (Maher, 1986).

As far as academic risk factors are concerned, organization of the lectures' timetable and studying less or equal to four hours per day were significantly associated with anxiety and stress among students ($p < 0.05$), meanwhile, exams' criteria was significantly associated with depression ($p = 0.018$), and lack of communication with teaching staff was significantly associated with stress ($p < 0.001$). These findings are consistent with those reported in literature where stress in medical students was found to be related to academic factors more than personal factors (Al-Dabal et al., 2010). According to a study conducted in Nepal, the most common sources of stress among medical students were high parental expectations, residence in a hostel, massiveness of curriculum, and exams (Sreeramareddy et al., 2007).

The amount and 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).

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, 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 and 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 and sample recruitment from a single public medical college limit the generalizability from results of this study.

Conclusion

Psychological illnesses in the form of depression, anxiety, and stress have been reported in substantial proportion of first year medical students at Menoufiya University; depression has been reported in 63.6% of students, while anxiety and stress were found in 78.4 and 57.8%, respectively. Multiple social, demographic, behavioral, and academic factors have been found to be significantly associated with most of the studied psychological morbidities; among them, gender, residence, feeling loneliness, the inability to share families in social activities, presence of insomnia and chronic physical illnesses, studying in English language, problems with exams' criteria, and the organization of lectures' timetable were the most common. Organized interventions should be initiated to prevent excessive psychological illness among medical students. Carrying out national coordinated survey on mental health of newly entrance undergraduate students will facilitate following up of those having mental illness. Stress reduction program could be offered regularly as integrated part of their curriculum.

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