SELF-REPORTED DEPRESSION AND ANXIETY BY STUDENTS AT AN EGYPTIAN MEDICAL SCHOOL

Mostafa Amr, Abdel Hady El Gilany

ABSTRACT

Objective: To explore the anxiety and depression experienced by medical students in Mansoura medical school and to identify its associated risk factors.

Design: Cross-sectional study

Place and duration of study: The study was conducted at Mansoura University, Mansoura, Egypt in 2009 and 2010

Subjects and methods: A self-administered questionnaire, including questions on sociodemographic characteristics and five instruments determining level of anxiety and depressive symptoms, perceived stress, physical wellbeing factors, and some personality traits were given to students who were selected by stratified cluster sampling.

Results: A total of 311 students were enrolled in the study. prevalence of depression and anxiety were 28.3% and 21.2%, respectively. Logistic regression analysis revealed that the independent predictors of depression were sex, level of perceived stress, level of satisfaction with early relation with mother. On the hand, the independent predictors of anxiety were level of perceived stress, neuroticism and residence. The mean depression and anxiety scores were 8.1 ± 3.3 and 9.9 ± 3.1, respectively. Linear regression revealed that anxiety score, number stressors, chronic health problem score, and score of early relation with mother are independently correlated with depression score. Whereas, perceived stress, early relationship with mother and neuroticism scores were independently correlated with anxiety score.

Conclusions: A relatively high frequency of both depression and anxiety among medical students warrants further nation-wide longitudinal studies including both governmental and private medical students in the country.

Keywords: Depression, anxiety, medical students

INTRODUCTION

Medical school curricula are designed to ensure every graduate knowledgeable, skillful, and professional[1]. Based on these characteristics, one may anticipate medical school would be a time of personal growth, fulfillment, and well-being despite its challenges[2]. Unfortunately, studies suggested the current educational process may have a negative effect on students' mental health, with a high frequency of depression and anxiety among medical students [3-6].

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Some have suggested that depression and anxiety among students may adversely influence their academic performance[7,8] contribute to academic dishonesty[9] and play a role in smoking and substance abuse[10,11].

In a 2002 survey of US medical students, 24% of students were depressed according to the Beck Depression Inventory[4]. In a separate study, median Beck Depression Inventory scores increased 3-fold from the time of matriculation to the end of the second year[5]. Vontver et al. [6] administered the State-Trait Anxiety Inventory (STAI) to 349 second year students and found mean trait anxiety scores were substantially higher than the mean score among 20-29-year-olds in the general population.

There were few studies on anxiety and depression among medical students in Egypt[12,13]. The purpose of this study is to explore the anxiety and depression experienced by medical students in Mansoura medical school and to identify its associated risk factors. By studying the existence and level of these variables in medical students, it is believed that substantial information about their effect on medical students can be gained.

SUBJECTS AND METHODS

A cross sectional survey was conducted in Mansoura College of Medicine in February 2010. This was after the mid year vacation and randomly selected students from all the six years were surveyed.

After literature review, a specially questionnaire was designed in English as a tool for data collection. This was pilot tested on a sample of 32 students, over one-week period, from different years and not included in the full-scale study. An interview was conducted after approval of the students. The questionnaire was modified accordingly in its final form e.g. rephrasing of some question and adding explanatory notes. This pilot study revealed that 25% and 23% of students suffer depression and anxiety, respectively. Finally the questionnaire was approved by the college authority as there is no formal research ethics committee.

Sample size was calculated using Epi info program version 6.02. According to students' affairs administration, the total number of registered medical students in 2009 was 6808 students of both sexes in the six years. From the pilot study it is expected that at least 23% of students suffer anxiety. With the worst acceptable level 18%, the sample needed for the study was estimated to be at least 262 students at a study power of 80% and 95% confidence level. To overcome the sampling error of using cluster sampling technique a 10% was added with a total final sample of 288 students.

Students were selected through stratified cluster sampling technique. First students were stratified into the different academic years (first to sixth). From each year a section or group (cluster) was randomly chosen. All students in the chosen cluster were included. A total of 366 students were registered in these clusters. Three hundred and eleven students completed the questionnaire (response rate of 85.0%). They were 164 (52.7%) men and 147 (47.3%) women students. Three nine students refused to participate and the other 16 were absent during the study period.

Participants completed an anonymous self-administered Arabic questionnaire covering socio-demographic factors, grade of the previous year, presence of stressor if any had occurred during the past twelve months, drug misuse; hospital anxiety and depression scale perceived stress scale (PSS), assessment of physical well-being factors; neuroticism and extraversion subscales of Eysenck personality questionnaire and scale items of perceptions of early relationships with the mother and father by a list of events with yes or no answer.

The degree of anxiety and depressive symptoms were measured by Hospital Anxiety and Depression Scale (HAD), where a score of 8 or more for either the anxiety or the depression components denotes possible anxiety or depression[14]. This cut off point had sensitivity 0.89, specificity 0.75[15]. The Arabic version of the HAD scale was validated by El-Rufaie and Absood [16]. The overall Cronbach alpha measures of internal consistency were 0.7836 and 0.8760 for anxiety and depression, respectively.

Stress was measured by a previously validated 14-item perceived stress scale (PSS). Cronbach coefficient of internal consistency was reported to be 0.85, and test-retest reliability during a short retest interval (several days) was 0.85[17]. The Arabic version was tested among a sample US Arab immigrants [18]. The PSS does not tie appraisal to particular situation; it is sensitive to the non-occurrence of events as well as to ongoing life circumstances. The stress score was stratified into no, mild, moderate (merged as low level) stress or severe (high level) stress according to first, second and third quartiles. Assessment of physical well-being factors [19] included: a) factors of somatic symptoms of stress including questions about skin rash, back pain, allergies, infectious diseases, frequent colds and generalized body pain; b) factors of agitation symptoms e.g. sleep problems, headache, nausea, lack of appetite; c) factors of eating/drinking and smoking problems; and d) factors of chronic illness and health problems interfering with daily activities. The global sickness index was based on an average score obtained from all 15 health problems listed in the questionnaire. The Cronbach's μ for the four physical well-being factors were in the 0.90s.

Neuroticism and Extraversion subscales of the Arabic version of the Eysenck personality questionnaire were used. Test-retest reliability were 0.81 and 0.77, respectively while Cronbach coefficient of internal consistency was reported to be 0.76 and 0.81, repsectively among medical students [20]. Neuroticism is a measure of emotional instability while extraversion is a measure of sociability.

Perceptions of early relationships with the mother and father were based on the scale items developed by Hojat et al in particular[21], the items were intended to measure perceptions of parents as secure bases for the child in trouble (item 1); Parents' sympathetic attitudes and social-emotional closeness (item 2) ; and parents' attention, involvement , and devotion (item 3). A higher score indicates a more favorable view of the parent. Validity and reliability were satisfactory among medical students[8]. Students were classified into three levels of satisfaction (low, medium and high). The levels were identified by using cut-off points on the corresponding distribution, which were roughly one standard deviation below the mean (low satisfaction), and one standard deviation above the mean (high satisfaction).

The investigators spent about 45 to 60 minutes in each class. The students were briefed about the study, encouraged to participate and motivated to express their experiences. The students give fully informed verbal consent to participate. It was emphasized that all data collected was strictly confidential. Efforts were made to minimize underreporting, including asking staff to leave

Table 1: Description of the sample and association of depression and anxiety with sociodemographic factors and psychiatric morbidity

		Total	No (%)	
		No (%)	Depression	Anxiety
Overall		311(100)	88(28.3)	66(21.2)
Age:	<20 years	99(31.8)	26(26.3)	23(23.2)
	20 years and more	212(38.2)	62(29.2)	43(20.3)
Sex:	Males	164(52.7)	35(21.3)**	31(18.9)
	Females	147(473)	53(36.1)	35(23.8)
Perceived stress:	Mild/moderate	248(79.7)	54(21.8)***	41(16.5)***
	Severe	63(20.3)	34(54)	62(39.7)
Number of stressors:	Up to 5	258(83.0)	68(26.4)	56(21.7)
	> 5	53(17.0)	20(37.7)	10(18.9)
Educational stage:	Preclinical	196(63.0)	47(24)*	93(63.3)**
	Clinical	115(37.0)	41 (35.7)	54(36.7)
Grade of previous year:	Excellent	92(29.6)	30(32.6)	23(25)
	Very good	83(26.7)	23(27.7)	18(21.7)
	Good	74(23.8)	22(29.7)	19(25.7)
	Pass	62(19.9)	13(21)	6(9.7)
Family residence:	Urban	185(58.5)	47(25.4)	30(16.2)**
	Rural	126(40.5)	41(32.5)	36(28.6)
Student's resident during study:	With family	249(80.1)	66(26.5)	52(20.9)
	University campus	33(10.6)	11(33.3)	7(21.2)
	Outside campus	29(9.3)	11(37.9)	7(24.1)
Family income:	Unsatisfactory	35(11.3)	16(45.7)*	11(31.4)
	Satisfactory	276(88.7)	72 (26.1)	55(19.9)
Family size:	Up to 5	186(59.8)	48(25.8)	39(21)
	> 5	125(40.2)	40 (32)	27(21.6)
Father's education:	Less than secondary	47(15.1)	14(29.8)	14(29.8)
	Secondary	58(18.6)	13(22.4)	10(17.2)
	Above secondary	206(66.2)	61(29.6)	42(20.4)
Father's work#:	Professional/semiprofessional	223(71.7)	63(28.3)	42(18.8)
	Others	78(25.1)	20 (25.6)	21(26.9)
Mother's education:	Less than secondary	72(23.2)	21(29.2)	19(26.4)
	Secondary	71(22.8)	23(32.4)	14(19.7)
	Above secondary	168(54.0)	44(26.2)	33(19.6)
Mother's work#:	Housewives	133(42.8)	34(25.6)	38(21.1)
	Work outside home	174(55.9)	54(31)	38(21.8)
Drug misuse:	Yes	53(17.0)	10 (18.9)	12 (22.6)
	No	258(83.0)	78(30.2)	54(20.9)
Early relationship with mother:	Low	56(18.0)	43(76.8)***	21(37.5)**
	Medium	222(71.4)	41(18.5)	39(17.6)
	High	33(10.6)	4(12.1)	66(21.2)
Early relationship with father:	Low	113(36.3)	40(35.4)	43(24.6)
	Medium	171(55.0)	43(25.1)	19(16.8)
	High	27(8.7)	5(18.5)	5(18.5)
Anxiety:	Yes	66(21.2)	28(42.4)**	66(100)
	No	245(78.8)	60(24.5)	0
Depression:	Yes	88(28.3)	88(100)	28(31.8)**
	No	223(71.7)	0	38(17.0)

Ten and four died fathers & mothers were excluded from analysis, respectively.

*,**,*** Significant difference at P<0.05, 0.01 and 0.001, respectively

the classroom at the time of completing the questionnaire and strongly emphasizing to the student that the questionnaire was anonymous and would not be disclosed to their parents or staff.

Data was analyzed using SPSS (Statistical Package for Social Sciences) version 11. In quantitative data, unpaired student's t-test was used for group comparison. In categorical data, Chi-squared test was used for comparison between groups. Odds ratio and 95% confidence interval was calculated. Significant factors predicting depression or anxiety on univariate analysis were entered into multivariate logistic regression analysis. Pearson's correlation coefficient was used to calculate correlation between depression and anxiety score and different psychosocial attributes. Significant correlations were entered in a linear regression model to predict the independent variable associated with depression and anxiety scores. $P < 0.05$ was considered statistically significant.

RESULTS

A total of 311 students were enrolled in the study. Their age ranged from 16 to 25 with a mean of 20.7 years ± 2.4. Prevalence of depression and anxiety were 28.3% and 21.2%, respectively. Prevalence of depression was significantly higher among females, students with severe level of perceived stress, in the clinical stage of education, with satisfactory family income, having low satisfaction with early relationship with the mother and presence of anxiety. On the other hand, prevalence of anxiety was significantly higher among students with severe perceived stress, in the preclinical stage of education, of rural family residence, having low satisfaction with early relationship with the mother and presence of depression (Table 1).

Table 2 reveals that the mean scores of chronic health problems, neuroticism and perceived stress were significantly higher among students with depression. On the other hand, the mean scores of agitation symptoms, neuroticism were significantly higher among anxious students. The mean score of perception of early relationship with mother was significantly lower among students with depression or anxiety.

Logistic regression analysis revealed that the independent predictors of depression were female gender, level of perceived stress, dissatisfaction with early relation with mother. On the hand, the independent predictors of anxiety were level of perceived stress, neuroticism and residence (Table 3).

The mean depression and anxiety scores were 8.1 ± 3.3 and 9.9 ± 3.1, respectively. Table 4 shows that there are significant positive correlations between depression score and score of anxiety, chronic health problems, neuroticism and perceived stress as well as number of stressors. On the other hand, anxiety score has significant positive correlations with neuroticism and perceived stress scores. Both depression and anxiety score showed inverse significant correlations with student' satisfaction with early relationship with the mother. Linear regression revealed that anxiety score, number stressors, chronic health problem score, and score of early relation with mother are independently correlated with depression score. Whereas, perceived stress, early relationship with mother and neuroticism scores were independently correlated with anxiety score (Table 5).

Table 2: Mean score of psychosocial attributes associated with depression and anxiety.

	Depression		Anxiety	
	Yes (223) **X±SD**	**No** (88) **X±SD**	**Yes** (245) **X±SD**	**No** (66) **X±SD**
Somatic symptoms	11.9±3.97	11.55±3.21	11.78±3.76	11.61±3.36
Agitation symptoms	9.36±3.5	9.41±2.67	10.41±3.36†	9.13±2.81
Habits	4.82±2.19	4.41±1.52	4.17±1.6	4.63±1.77
Chronic health problems	3.9±1.8**	3.31±1.37	3.45±1.62	3.49±1.5
Global sickness index	29.97±7.05	28.7±5.8	29.82±6.6	28.85±6.08
Extraversion	14.88±4.95	14.6±4.56	13.85±4.42	14.9±4.71
Neuroticism	17.56±5.31***	15.39±4.4	18.33±4.99††	15.37±4.52
Psychoticism	15.15±4.34	15.65±3.97	15.53±3.88	15.49±4.13
Perceived stress	30.7±8.45***	27.0±6.12	30.65±6.98†	27.34±6.91
Early relationship with the mother	6.98±3.97***	9.68±1.65	8.09±2.71†	9.14±2.15
Early relationship with the father	6.1±2.2	6.8±2.8	6.7±2.8	6.8±2.9

,* Significant difference compared to no depression at Pd"0.01 an 0.001, respectively

†,†† Significant difference compared to no anxiety at Pd"0.05 an 0.01, respectively

Table 3: Logistic regression analysis of significant predictors of depression and anxiety

		Depression			Anxiety		
		β	P	OR (95% CI)	β	P	OR(95% CI)
Sex:	Males	—		1(r)			
	Females	0.8	0.01	2.1(1.2-3.9)			
Perceived stress:	Mild/moderate	—		1(r)	—	0.007	1(r)
	Severe	1.3	0.000	3.6(1.8-7.2)	0.9		2.5(1.3-4.7)
Family residence:	Urban				—		1(r)
	Rural				0.8	0.009	2.2(1.2-3.9)
Neuroticism (continuous variable)					0.11	0.001	1.12(1.05-1.2)
Early relationship with mother:							
	Low	—		1(r)			
	Medium	-2.7	0.000	0.1(0.03-0.14)			
	High	-3.0	0.000	0.05(0.01-0.18)			
Constant		0.5			-3.8		
Percent correctly predicated		81.4			79.4		
Model χ^2		χ^2=93.9,P=0.000			χ^2=34.2,P=0.000		

OR= Odds ratio, CI= Confidence Interval, r= reference group

Table 4: Bivariate correlation between depression and anxiety score and different psychosocial attributes

	Depression score r	Anxiety score r
Anxiety	0.4***	
Number of stressors	0.15**	0.09
Somatic symptoms	0.6	0.07
Agitation symptoms	- 0.03	0.13
Habits	0.06	- 0.07
Chronic health problems	0.16**	0.02
Global sickness index	0.08	0.09
Extraversion	- 0.07	- 0.1
Neuroticism	0.21***	0.28***
Psychoticism	- 0.1	- 0.04
Perceived stress score	0.27***	0.26***
Early relationship with the mother	- 0.54***	- 0.25***
Early relationship with the father	-0.03	-0.06

,* Significant correlation at P<0.01 and 0.001, respectively

DISCUSSION AND CONCLUSION

Medical school has long been recognized as involving numerous stressors that can affect the well-being of students [22]. In our study found that 28.3% and 21.2% 0f medical students in Mansoura University had depressive and anxious symptomatology, respectively. Several other studies from different Western countries as well as from Arab world reported comparable rates of depression among medical students [4,5,23]. However, the rate is much lower than the 60% reported among Pakistani medical students [24] Differences in the selection pro-

Table 5: Linear regression of significant predictor of depression and anxiety score

	Depression score		Anxiety score	
	β	P	β	P
Anxiety score	0.3	0.000		
Number of stressors	0.2	0.000		
Chronic health problems	0.2	0.03		
Perceived stress score			0.1	0.002
Early relationship with the mother	-0.7	0.000	-0.24	0.001
Neuroticism			0.12	0.001
Constant	9.7		7.9	
R^2	0.39		0.14	
Model χ^2	χ^2=49.5,P=0.000		χ^2=17.3,P=0.000	

cedures, instruments used as well as social profile may account for such differences.

Linear regression revealed that the low anxiety scores are significantly correlated with the low level of PSS, while low depression scores are significantly correlated with few number of stressors and chronic health problems.

Several studies explored the relationship between level of perceived stress and student depression/anxiety [2]. Perceptions of stress were found to correlate with depression, anxiety [25, 26], health problems [27] and to predict future risk of depression [28] Okasha et al.[12] concluded that most cases of anxiety and anxiety had been reactive to either maturational or environmental stresses rather than endogenous.

It is possible that medical students find medical education stressful with a high stress level reported higher level of related psychosomatic activity and increased mood disturbances[17]. Liu et al[29] showed that poor health status, test pressure, conflict with classmates and the personality trait of introversion, were independently associated with the presence of anxiety.

Although stress may cause physical and psychiatric (depression and anxiety) symptoms it is possible that elevated stress may cause these symptoms or a third factor for example socioeconomic status, influenced both stress and health [17, 30]. Because of data in the present study were cross-sectional, the direction of any association between stress and different physical and mental predictors cannot be determined. A recent study has found that Depression is a frequent complication of chronic illness [31].

The presence of clinical anxiety as measured by HADS-A is significantly correlated with significantly correlated with the neuroticism on linear regression. Neuroticism has enjoyed a well-accepted role in the characterization of personality traits. Reflecting a tendency toward states of negative affect [32]. Trait anxiety, as measured by the general items of the State-Trait Anxiety Inventory – Trait is a proxy for neuroticism with large positive correlations between the STAI – Trait and various measures of neuroticism [33]. A possible genetic correlation between anxiety and neuroticism was cited by Hettema et al. [34]

In our study, it was found that the high anxiety and depressive scores are significantly correlated with the low level of satisfaction with early relationships with the mother on linear regression.

It was found that lack of communication within the family, presence of child-parent conflict , parental conflicts and parental separation rather than death ranked highest among predisposing factors in the Egyptian adolescents who demonstrated depressive scores [44] and moderate anxiety on the Taylor anxiety scale[36].

These results also give support to the work of Hojat[21], who reported that perceived satisfaction with the mother, but not with the father, in childhood was significantly associated with less adult psychiatric conditions such as depression and anxiety. However this condition may change in Egypt in the near future because of several factors , including major changes in family structure and function, increasing numbers of working mothers with alternative child-care activities .

The depressive scores are significantly correlated with the anxiety scores on linear regression. To gain more understanding of the relationship between anxiety and depression, the Kuwait University Anxiety Scale and the Beck Depression Inventory II were administrated in 18 Arab countries. The findings indicated that depression is positively significantly correlated with anxiety. This finding may be because anxiety and depres-

sion are often found correlated positively with depression even in nonclinical samples [37].

Thus, although comorbidity between anxiety and depression is quite common in adolescents. About 25-50% of depressed youth have comorbid anxiety disorders and about 10-15% of anxious youth have depression [38]. Twin and family studies have demonstrated that pediatric anxiety disorders and depression likely share some common genetic factors or influences [39].

A limited sample size can be a possible limitation of the study. Future studies should focus on a big sample size from different colleges so that a better conclusion can be drawn about the risk factors for depression and anxiety among medical students , in addition the the use of a self administered scale for psychopathology may limit the interpretation of the results

Appropriate mental health services including early detection and management of the risk factors associated with depression and anxiety using clinical interviews may mitigate the possible negative consequences. A relatively high frequency of both depression and anxiety among medical students warrants further nation-wide longitudinal studies including both governmental and private medical students.

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