Depression, anxiety and stress with possible sources of stressors among undergraduate medical students in Malaysia

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ABSTRACT

Introduction: It is well known that medical students are subjected to different levels of stressors during various stages of their study. Exposure to severe and prolonged stressors may cause serious emotional disturbances in the form of depression, anxiety and stress which may hinder students' academic performance, quality of life, and also their physical health. Therefore, this study aimed to determine the prevalence and severity of depression, anxiety and stress symptoms and also to determine the possible sources of stressors and their relationship with these symptoms among medical undergraduate students throughout the different stages of their study. **Materials and Methods:** a cross sectional study was conducted among 501 students from the Faculty of Medicine, International Islamic University Malaysia. Depression Anxiety, Stress Scale (DASS-21) was used to assess the prevalence and severity of depression, anxiety and stress. The sources of stressors were identified by giving the students a list of the most possible source of stressors which were chosen depending on previous studies. **Results:** The overall prevalence of depression, anxiety and stress was 39.7%, 65.8% and 37.1% respectively but it was found that 7.2%, 29.7% and 7.4% of medical students have clinically significant depression, anxiety and stress respectively. The emotional disturbances were significantly higher among female students. Younger students aged ≤21 years were experiencing significantly higher mean score of depression, anxiety and stress. Regarding the source of stressors, the top ten stressors decided by the students were mainly academic and personal factors. **Conclusion:** Emotional disturbances in the form of depression, anxiety and stress are existing in medical students which require early intervention. Academic and personal factors can be considered as sources of stressors that may precipitate for depression anxiety and stress.

Keywords: Depression, anxiety, stress, medical undergraduate

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INTRODUCTION

Mental health is a fundamental portion of health and well-being, as reflected in the definition of health in the Constitution of the World Health Organisation: "Health is a state of complete physical, mental and social well-

being and not merely the absence of disease or infirmity". [1] It is well known that medical students are experiencing different levels of stressors during various stages of their studies. [2, 3] Stress during education can lead to mental distress and have negative impact on cognitive functioning and learning. [4] However, as students are at a crucial stage of development, they are more prone to experience mental illnesses in the transition from being an adolescent to an adult.

Higher education is considered as a stressful period in students' life which they have to cope with since they are facing a variety of demands such as living away from their families, a heavily loaded curriculum, and inefficiency in both mentor- mentee and health education programmes. This will make them more vulnerable to emotional disturbances such as stress, anxiety and depression. [5] Depression is defined by the American Psychiatric Association in the Diagnostic and Statistical Manual of Mental Disorders–5 (DSM-5) as a disorder that is characterised by either a depressed mood or markedly diminished pleasure in all activities in addition to at least four other symptoms within a duration of at least two weeks, these symptoms include, significant weight loss/weight gain, disturbed sleep, diminished concentration, fatigability, psychomotor agitation or retardation, feeling of worthlessness or inappropriate guilt, thoughts of death or recurrent suicidal ideation. [6] Anxiety is a condition that is characterised by intense feeling of dread, accompanied by somatic symptoms that indicate a hyperactive autonomic nervous system, also it impairs cognition and may produce distortions of perception. [7] Stress can be defined as the physiological and psychological response to

events that are appraised as threatening or challenging that require adjustment. [8]

Stress during education can lead to mental distress and have a negative impact on cognitive functioning and learning. [4] Emotional disturbances and distress may lead increased risk of suicide among medical students. [9]

Since previous studies among medical revealed variable rates of depression, anxiety and stress symptoms, this study aimed to determine the prevalence and severity of these symptoms using large sample size and to identify the possible sources of stressors and their relationship with these symptoms.

MATERIALS AND METHODS

This is a cross sectional study which was conducted among undergraduate medical students from Kulliyyah (faculty) of Medicine, International Islamic University Malaysia (IIUM) during the period from April 2012 to June 2013. A research grant sponsored by the Research Management Centre, International Islamic University Malaysia was obtained for conducting this research and ethical approval was obtained from International Islamic University Malaysia Research Ethical Committee prior to conducting the study. The participation was entirely on a voluntary basis; the researchers introduced themselves to the students in each grade and informed them about the aims of the study, guarantees of anonymity and confidentiality.

Consent was obtained from the students. The study was conducted in middle of the course before the examination period so as to minimise the extra stress symptoms.

The inclusion criteria were students who agreed to participate in the study and the students should be registered as undergraduate students of Kulliyyah of Medicine, IIUM. Students who fail to give consent, and those who were not conversant in English were excluded from the study. The socio-demographic characteristics of the participants were obtained; the gathered information was about the nationality, age, marital status, gender, year of study, accommodation during study and household income.

The emotional disturbances were assessed by using the Depression Anxiety, Stress Scale (DASS-21) which is a short version, self- rated questionnaire that is designed to assess the severity of the symptoms of depression, anxiety and stress; it consists of statements referring to the past week. Each item is scored on a 4-point scale (0 = Did not apply to me at all, 1= Applied to me to some degree, or some of the time, 2 =Applied to me to a considerable degree, or a good part of time, and 3 = Applied to me very much or most of the time) [10]. Subjects were asked to use 4-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. Each subscale was categorized into normal, mild, moderate, severe and extremely severe. In this study, we further classified those who have severe and extremely severe symptoms as '*clinically significant*' and those with mild and moderate as '*subclinical*'.

The students were given a list of the most possible source of stressors which were chosen depending on previous studies. [3, 11-14]

The list was composed of a variety of stressors that are related to living and accommodation, personal, academic, environmental and social factors. The respondents were asked to check each item throughout the list and tick "yes" for the item that they considered as the most stressful factor which they experienced during the current academic year.

Statistical Analysis: We used the statistical package for social science program, version 20.0 (SPSS 20.0) for analysing the data. The analysis of qualitative variables such as age group, gender, nationality, monthly household income, marital status, year of study and type of accommodation were presented in number and percentage. Mann-Whitney U test and Kruskal-Wallis test were used to determine the effects of the socio-demographic characteristics on the emotional disturbances among undergraduate science students. The association between the ten stressor factors and the emotional disturbances were evaluated using independent t-test. *P* values less than 0.05 was considered statistically significant

RESULTS

The total response rate of medical students was 79.5%. Out of 501 students, 117, 112, 106, 95, and 71 students were from Year 1, Year 2, Year 3, Year 4, and Year 5 respectively. The majority of the students were females, aged above 21 years, Malaysian nationality, single, living in the hostel with monthly household income ranging from $1501-5000 Ringgit Malaysia and receiving support from their families.

The overall prevalence of depression, anxiety and stress was 39.7%, 65.8% and

Table 1: Total rate and severity of emotional disturbances among medical students.

	Depression n (%)	Anxiety n (%)	Stress n (%)
Normal (not affected)	302 (60.3)	171 (34.1)	315 (62.9)
Subclinical	163 (32.5)	181 (36.1)	149 (29.7)
Clinically significant	36 (7.2)	149 (29.7)	37 (7.4)
Total number of affected students	199 (39.7)	330 (65.8)	186 (37.1)
Total	501(100)	501 (100)	501 (100)

37.1% respectively. Most had subclinical manifestations apart from clinically significant anxiety (Table 1).

Comparisons between the various variables showed that being female, younger aged students ≤ 21, and year of study were significant factors for depression and anxiety (*p* values <0.05). For anxiety, staying in hostel was also important factor (*p*<0.05). Important factors for level of stress were female gender, younger age, year of study (all *p* values <0.05) and trending towards significant

for reported household income (*p*=0.058) (Table 2).

In addition to that, three other important stressors were decided by medical students to be important source of stressor namely reduced holidays, lack of time for relaxation, and limitation of leisure and entertainment time (70.3%, 66.9%, 58.1% respectively) (Table 3).

With regard to the top ten stressors chosen, all except reduced holidays and limi-

Table 2: Factors determining significant emotional disturbances among undergraduate students of Kulliyyah (faculty) of Medicine.

	Total No. (%)	Mean Depressive Level	*p* Value	Mean Anxiety Level.	*p* Value	Mean Stress Level	*p* Value
Gender							
Male	190 (37.9)	7.58 ± 0.51	**0.014**	10.66 ± 1.18	**0.001**	12.28 ± 1.14	**<0.001**
Female	311(62.1)	8.89 ± 0.39		12.69 ± 0.79		14.55 ± 0.73	
Age (years)							
≤ 21	167 (33.3)	9.14 ± 0.51	**0.011**	15.99 ± 1.34	**<0.001**	15.62 ± 1.23	**<0.001**
>21	334 (66.7)	8.02 ± 0.39		9.89 ± 0.72		12.72 ± 0.71	
Household income							
≤ RM1500	92 (18.4)	7.72 ± 0.65	0.744	10.20 ± 0.79	0.433	11.24 ± 0.73	0.058
RM 1501-5000	234 (46.7)	8.56 ± 0.45		12.85 ± 1.32		13.99 ± 0.94	
>RM 5000	175 (34.9)	8.53 ± 0.57		11.59 ± 0.61		14.58 ± 1.21	
Year of study							
Year 1	117 (23.4)	9.28 ± 0.56	**0.003**	16.80 ± 1.85	**<0.001**	16.31 ± 1.69	**0.010**
Year 2	112 (22.4)	8.54 ± 0.72		12.09 ± 0.75		12.28 ± 0.75	
Year 3	106 (21.2)	9.11 ± 0.65		10.94 ± 0.71		13.91 ± 0.71	
Year 4	95 (19.0)	7.03 ± 0.70		10.36 ± 2.19		13.26 ± 2.13	
Year 5	71 (14.2)	7.46 ± 0.95		7.15 ± 0.95		11.86 ± 0.99	
Family support							
No	54 (10.8)	8.89 ± 0.93	0.450	9.70 ± 0.99	0.162	11.22 ± 0.97	0.082
Yes	447(89.2)	8.34 ± 0.33		12.19 ± 0.74		13.99 ± 0.69	
Accommodation							
Hostel	423 (84.4)	8.57 ± 0.34	0.182	12.47 ± 0.77	**0.004**	14.04 ± 0.73	0.251
Non-Hostel	78 (15.6)	7.46 ± 0.75		8.92 ± 0.82		11.82 ± 0.80	

Data was analysed using Mann–Whitney U test for two independent variables and Kruskal–Wallis one-way analysis of variance for more than two independent variables. P values less than 0.05 was considered statistically significant. Data was presented as mean ± SEM

Table 3: List of top 10 factors which are considered stressors by the students.

No.	Stressor	n (%)
1	Fear of failing	401 (80.0)
2	Study pressure and obligation	384 (76.6)
3	Examination and grades	368 (73.5)
4	Time management problems	367 (73.3)
5	Academic overload	353 (70.5)
6	Reduced holidays	352 (70.3)
7	Lack of time for relaxation	335 (66.9)
8	Feeling of incompetence	311 (62.1)
9	Lack of motivation to learn	302 (60.3)
10	Limitation of leisure and entertainment time	291 (58.1)

tation of leisure were significantly associated with depression. For anxiety, only three stressors; examination and grades, feeling of incompetence and lack of motivation to learn were significantly associated with higher score. Another three stressors which are fear of failing, examination and grades and feeling of incompetence were significantly associated with stress. The top two stressors which are significantly associated with depression, anxiety and stress were examination and grades and feeling of incompetence (Table 4)

DISCUSSION

In this study, the rate of depression among medical students is higher than previous studies in Malaysia and other countries [15, 16] but it is lower than a study in Malaysia in which it was 41.8% [17] and also another done in Pakistan which stated it to be 60%. [18] Furthermore it is much lower than another study among science students in Malaysia in which the rate was 64.4%. [19]

Regarding the severity of depression, it was found that 7.2% of medical students had clinically significant depression which is

Table 4: Association of the top ten stressors with depression, anxiety and stress.

	No.	Mean Depressive Level	p Value	Mean Anxiety Level.	p Value	Mean Stress Level	p Value
Fear of failing							
Yes	401	8.93	**0.001**	12.13	0.520	14.44	**0.016**
No	100	6.26		11.06		10.67	
Study pressure and obligation							
Yes	384	9.18	**<0.001**	12.33	0.268	13.84	0.790
No	117	5.83		10.58		13.20	
Examination and grades							
Yes	368	9.01	**0.001**	12.92	**0.012**	14.81	**0.003**
No	133	6.69		9.14		10.60	
Time management problems							
Yes	367	9.37	**<0.001**	12.37	0.270	14.41	0.059
No	134	5.72		10.70		11.73	
Academic overload							
Yes	353	9.33	**<0.001**	12.23	0.470	13.78	0.881
No	148	6.18		11.18		13.49	
Reduced holidays							
Yes	352	8.69	0.144	12.42	0.249	13.95	0.523
No	149	7.69		10.74		13.07	
Lack of time for relaxation							
Yes	335	8.98	**0.008**	12.23	0.506	13.72	0.943
No	166	7.22		11.29		13.63	
Feeling of incompetence							
Yes	311	10.21	**<0.001**	13.34	**0.006**	15.63	**<0.001**
No	190	5.42		9.59		10.52	
Lack of motivation to learn							
Yes	302	10.35	**<0.001**	13.03	**0.041**	14.75	0.078
No	199	5.53		10.24		12.09	
Limitation of leisure							
Yes	291	8.84	0.096	12.91	0.079	13.61	0.896
No	210	7.78		10.54		13.80	

lower than a study done by Lowe *et al*., which revealed that 40% of university students were clinically depressed [20] and it's also lower than the rate of clinically depressed science students in which it was found to be 13.9%. [19] However it is consistent with the results of another study in Malaysia in which the rate of clinical depression was 5.5%. [17]

Regarding anxiety, the overall prevalence among medical students was slightly higher than other studies done in Malaysia that reported a rate of 63% and 60% respectively. [15, 17] but it was lower than a study among non-medical students done in Brunei in which the rate was 79%. [21] Despite the high overall rate of anxiety, it was clinically significant in only 29.7% of the students which is slightly higher than previous study in Malaysia [17] but it was lower than the rates in other previous studies. [19, 22]

Although the overall rate of stress in our study is similar to a previous study in Malaysia [17], it is lower than other previous studies. [2, 19, 21] Furthermore, only 7.4% of medical students had clinically significant stress.

The reasons behind getting different rates of depression, stress and anxiety than previous studies may be due to the use of different assessment tools, type of course studied, sample size, stages of study, difficulty in curriculum and cultural differences.

In this study, the mean score for depression, anxiety and stress was significantly higher among female than male medical students. This result is similar to previous studies. [2, 16, 23-25] Our results showed that the year of study was statically significant related to

depression, anxiety and stress and the highest mean score for depression, anxiety and stress was among year one medical students while the lowest score was among year five students. We also found that younger students (≤21 years) had significantly higher mean score of depression, anxiety and stress which is similar to previous study among science students in Malaysia. [19] The reasons behind these results may be because younger students have less skill in dealing with challenges in life, are going through transition phase, inexperienced in managing their time, inability to adjust to the new environment, difficulty in adapting to university curriculum. Furthermore, Year 1 students are newly exposed to university atmosphere and have less capability to deal with stressors compared to year 5 students who have been medically educated and trained in their psychiatry about coping with stress.

However, the result of our study concerning depression is inconsistent with previous studies as they found that depression is more common among older students [15, 26] while other study had revealed that there is no significant association between age and depression among college students. [27]

Although the mean scores for depression anxiety and stress were higher among students who lived in a hostel compared to those who are not, only anxiety was statistically significant (and this may be due to separation from the family and living independently that leads to a feeling of insecurity.

Academic and personal factors played an important role as source of stressors since most of the top ten stressors chosen by medi-

ical students were related to them. This finding is comparable with other studies in which the academic related factors were considered as the main sources of stressors. [3, 12, 28, 29] In addition to that, three other important factors were decided by medical students to be important source of stressor namely reduced holidays, lack of time for relaxation, and limitation of leisure and entertainment time (70.3%, 66.9%, and 58.1% respectively).

With regard to the association between the top ten stressors chosen by the medical students with depression, anxiety and stress, our results revealed that for depression, all the ten stressors, except reduced holidays and limitation of leisure, were significantly associated. Whereas for anxiety, only three stressors namely examination and grades, feeling of incompetence and lack of motivation to learn were significantly associated. Another three stressors; fear of failing, examination and grades and feeling of incompetence were significantly associated with stress. The top two stressors which are significantly associated with depression, anxiety and stress were examination and grades and feeling of incompetence.

In conclusion, emotional disturbances in the form of depression, anxiety and stress exist in medical students, especially among female and younger students. Academic and personal factors can be considered as sources of stressors that may precipitate for depression anxiety and stress. Efforts need to be given to overcome these difficulties in their academic life such as improving the mentor/ mentee programmes and steps should be taken to enhance counselling sessions for students with high level of emotional disturb-

ances and to work with them to find solutions for their problems in order to reduce the pressure applied on them and motivate them to put a better effort in their study. Another important aspect to be considered is the frequency and difficulty of the assignments and examinations that are given to students so that the students will not be overloaded and will able to maintain psychological well-being.

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