

ORIGINAL ARTICLE

Stress among medical Saudi students at College of Medicine, King Faisal University

A.G. ABDEL RAHMAN^{1,2}, B.N. AL HASHIM², N.K. AL HIJI², Z. AL-ABBAD²¹ Department of Community, Environmental and Occupational Medicine-Faculty of Medicine, Suez Canal University, Ismailia, Egypt;² Faculty of Medicine, King Faisal University, Saudi Arabia

Key words

Stress • medical students • Risk factors of stress • Social risk factors • Psychological risk factors

Summary

Background. Sources of student stress can be academic pressures, social or personal issues and medical students have to face the challenge of rigorous curriculum and also have to learn how to deal with emotionally difficult experiences.

Aim of Work. Determination of the prevalence of stress and to identify the risk factors of stress among Saudi medical students at Faculty of Medicine, King Faisal University, Saudi Arabia.

Methods. A survey study design was conducted among medical students at Faculty of Medicine, King Faisal University, Al Ahsaa Governorate, Eastern Province from February-May, 2013. Both male and female students were invited to participate in our study. The total number of students was 650 Saudi medical students, out of them 244 medical students were participated in the current study. All participants were provided a self administered questionnaire. A likert scale with 3 points for responses was used. Questionnaires were given to participants 2 month before end-semester examinations, to minimize the extra stress symptoms A score of stress was calculated.

Results. Prevalence of stress was 53% among Saudi students. Gender has no role in stress among medical students ($p > 0.05$). Logistic regression analysis revealed the most important risk factors of stress, having places for recreation at the University showed a relationship with stress among medical students with a p value = 0.000, there is a statistically significant relationship between stress and having optimal place for studying outside the university $p = 0.001$, while, comparing number of sleeping hours with stress, we could not find a statistically significant relationship among medical students, $p = 0.744$. Medical students who had close friends to share with them their stresses and concerns showed a highly statistically significant relationship between stressed and unstressed students $p = 0.001$.

Conclusion. Medical students reported high levels of stress. The most frequently occurring stressors among the students were related to academic and psychosocial domains. The associations between stressed cases and gender, occurrence of academic and psychosocial stressors need to be further tested by prospective studies.

Introduction

University student's life is subject to many different kinds of stress, and sources of student stress can be academic pressures, social or personal issues and medical students have to face the challenge of rigorous curriculum and also have to learn how to deal with emotionally difficult experiences [1]. It is usually observed that medical students undergo tremendous stress during various stages of the medical education. Stress is defined as the body's non-specific response to demands made upon it, or to disturbing events in the environment. It is not just a stimulus or a response but rather, it is a process by which we perceive and cope with environmental threats and challenges. Personal and environmental events that cause stress are referred to as stressors [2-4]. In addition to coping with the normal stressors of everyday life, medical sciences students must deal with stressors specific to medical school, which include information and input overload, financial indebtedness, lack of leisure time, and pressures of work, work relationships and career choices [5]. Recently stress during medical training is increasingly being reported in published literature.

Previous studies have shown fairly high levels of distress, such as symptoms of depression [6, 7] and even suicide thoughts among medical undergraduates [8, 9]. The potential negative effects of emotional distress on medical students include impairment of functioning in class-room performance and clinical practice, stress-induced disorders and deteriorating performance [10, 11]. Sources of student stress can be academic pressures, social or personal issues, and financial problems. In recent years, there has been a growing appreciation of the stresses involved in the training of health professionals [1]. Medical programs have always been regarded as a popular choice for tertiary education. Only those who have excellent academic achievement can be successful in the course. Therefore, the medical program may be even more competitive and stressful for students who are accepted [12, 2]. In addition to stress the students' social, emotional and physical as well as family problems may influence their learning ability and academic performance [13]. Students often begin their medical education unaware or emotionally unprepared to cope with these challenges. There is increased interest among medical educators and administrators to promote a cul-

ture of wellness, professionalism, self-care, and help-seeking in medical students. In the current study we aim to determine the prevalence of stress and to determine the risk factors of stress among Saudi medical students at Faculty of Medicine, King Faisal University, Saudi Arabia.

Subjects and methods

A survey study was conducted among Saudi medical students (preparatory, first year, 3rd year, 5th year and 6th year medical students) at Faculty of Medicine, King Faisal University, Al Ahsaa Governorate, Eastern Province from February-May, 2013. All male and female students in these years were invited to participate in our study. The total number of students is 650 medical students, out of them 244 medical students were participated in the current study. All participants were provided a self administered questionnaire. Consent of the Faculty of Medicine administrative was provided before delivery of questionnaires. A written consent with assurance of confidentiality was provided from all participants. A self administered questionnaire of 4 sections was constructed in order to determine the factors that may cause stress among medical students Faculty of Medicine, KFU. The 5 sections included personal data (age, sex, marital status and year of study), factors related to the content of the curriculum and method of learning and exams, familial factors, health status factors and social, a separate section for stress score risk factors. The self administered questionnaire was constructed in Arabic and back translated into English version. A pilot testing of the questionnaire was done before data collection for validity of the questionnaire. Modifications were performed according to pilot study results. A likert scale with 3 points for responses was used. Questionnaires were given to participants 2 month before end-semester examinations, to minimize the extra stress symptoms. Data collection was performed in two weeks. The questionnaires were distributed to the participants during face-to-face sessions inside the lecture halls separately according to the year of study. The process of filling in the questionnaires took one day to complete and they were to be returned on the next day. A score for stress was calculated using the mean score for all risk factors related to the stress section in the questionnaire and divided into stressed and not stressed. The mean score of all risk factors was calculated. All participants below the mean score were considered as not stressed students and all participants above the mean score were considered as stressed students.

Data analysis

All data collection forms were given serial numbers. Data were entered, checked for data entry errors, explored and cleaned. Data were interpreted using an alpha (α) set at 0.05 with two tailed direction and confidence in-

terval of 95%. Descriptive analysis was done in the form of frequency, percent, mean and standard deviation and graphs. Initial comparisons were done using Chi-Square test for categorical variables, and student-t-test for quantitative variables. The risk factors for stress among medical students were obtained using the logistic regression analysis. The dependent variable was the presence and absence of stress in all the students. All variables described previously were considered as possible candidates for the final model. The initial multivariable model construction consisted in the preliminary selection of variables using a manual, purposeful selection method and a relatively large significance level (a approximately 0.25). Subsequently, the resulting model was reduced using a likelihood ratio test with a significance level of 0.05. The calibration of the final model was assessed using the Hosmer and Lemeshow goodness-of-fit test, and its discrimination was assessed by the area under the receiver operator characteristics curve. All statistical analyses were performed using the Statistical Package for Social Science (SPSS) version 17.0 (SPSS Inc. Headquarters, Chicago, Illinois, USA).

Results

The total number of the medical students participated in the current study was 244, both genders male and female students were participated. Students were distributed as 29% from preparatory year, 42% first year, 26% from third year, and only 3% from sixth year. The mean of their age 20.3 ± 1.7 , the range was (18-25). The mean age of stressed students was 19.9 ± 1.4 compared with mean age of unstressed students of 20.7 ± 1.9 with a p value of 0.001. Table I showed the distribution of the demographic characteristics among the Saudi medical students at Faculty of Medicine. Prevalence of stress is 53% among medical Saudi students. Gender has no role in stress among medical students ($p > 0.05$). Table II revealed the factors that are related to the content of curriculum, method of learning and exams that cause stress among medical Saudi students at Faculty of Medicine. Table III showed the distribution of stress among the Saudi medical students according to familial factors that may lead to stress among students, all factors showed highly statistical significance between stressed and unstressed students. Table IV showed the mixture of all risk factors in causing stress among medical students by using regression analysis. Having places for recreation at the University showed a relationship with stress among medical students with a p value = 0.001, additionally, there is a statistically significant relationship between stress and having optimal place for studying outside the university $p = 0.001$, while, comparing number of sleeping hours with stress, we could not find a statistical significance relationship among medical students, $p = 0.744$. Medical students who have close friends to tell them about their stresses and concerns showed a highly statistical significance between stressed and unstressed students $p = 0.001$

Tab. I. Distribution of the demographic characteristics among the Saudi medical students at Faculty of Medicine, King Faisal University.

	Number = 244	Percent
Age of students Mean \pm SD Range	20.3 \pm 1.7 (18-25)	
Gender of students Male	142	(58.2%) (41.8%)
Marital status of students Single	184	(75.4%)
Residence Al Hassa	206	(84.4%)

When percentages of 2 groups are reported it is not necessary to report them for both groups (if females are 30% it is obvious that males are 70%).

In Table I an average age of 15 years is reported, that is not possible for medical students.

Some results are reported in Tables, some others in Figures with different formats. The results of a unique logistic regression must be reported in a Table with the same format for all the included variables.

The OR reported in Table 4 are not understandable: which is the measurement scale? What does an OR = 500 mean? Which is the direction of the association?

Do not write $p = 0.000$ but rather $p < 0.001$.

Tab. II. Stress among Saudi medical students due to methodology of studying, learning and exams at Faculty of Medicine, King Faisal University.

	Stress N=129 (%)	No stress N=115 (%)	P value
Finishing all curriculum before entering exam Yes No	44 (63.8%) 85 (48.6%)	25 (36.2%) 90 (51.4%)	0.032
Questions for exams are suitable for my abilities and suitable for curriculum in its number and difficulty Yes No	24 (57.1%) 105 (51.9%)	18 (42.9%) 97 (48.1%)	0.562
Number of exams is suitable for me to be motivated to study all the time Yes No	67 (44.1%) 62 (67.4%)	85 (55.9%) 30 (32.6%)	0.001
I have plan to study and I use it to organize my time during my studies Yes No	106 (59.6%) 23 (34.8%)	72 (40.4%) 43 (65.2%)	0.001
I have some difficulty in understanding the information in textbooks and it waste my studying time Yes No	117 (55.9%) 12 (34.3%)	92 (44.1%) 23 (65.7%)	0.017

Tab. III. Stress due to familial risk factors among Saudi medical students at Faculty of Medicine, King Faisal University.

	Stress N=129 %	No stress N=115 %	P value
Living with your parents Yes No	113 (57.9%) 16 (32.7%)	82 (42.1%) 33 (67.3%)	0.002
Motivation of the family for your study Yes No	112 (59.3%) 17 (30.9%)	77 (40.7%) 38 (69.1%)	0.001
Acceptance of the family for your study and your future career Yes No	114 (56.4%) 15 (35.7%)	88 (43.6%) 27 (64.3%)	0.014
Parents expectancy that you will get high marks make you nervous Yes No	103 (58.2%) 26 (38.8%)	74 (41.8%) 41 (61.2%)	0.007

Tab. IV. Factors associated with stress among medical students in the multivariable analysis.

	Odds Ratio	95% Confidence Interval	P value
Living with parents	0.48	0.128-1.814	0.281
Failing in previous exams	0.40	0.134-1.209	0.105
Concentrating in studying before exams	0.489	0.210-1.137	0.097
Finishing all curriculum before entering exams	0.481	0.195-1.186	0.112
Number of exams is suitable for students to motivate them to study all the time	0.351	0.156-790	0.011
There are places for amusement in the university students can use	0.303	0.131-0.699	0.005
Having optimal place for studying	0.355	0.163-774	0.009
Students' Family motivation to study	0.544	0.217-1.365	0.195
Acceptance of families to the career of study	0.331	0.110-0.992	0.048
Thinking in health status	0.263	0.111-0.624	0.002
Planning and organizing time of study	0.365	0.152-0.873	0.023
Family expectations of getting high marks	0.394	0.170-0.912	0.030
Having difficulty in understanding information in textbooks	0.579	0.192-1.749	0.333
Doing great efforts in studying	2.562	1.058-6.203	0.037
Age of students	1.259	0.953-1.664	0.105
Gender of students	1.774	0.819-3.841	0.146

Discussion

Stress is a physical, mental, or emotional response to events that causes bodily or mental tension. In small amounts, stress is normal and can help us be more active and productive. However, very high levels of stress experienced over a prolonged period can cause significant mental and physical problems [1]. In our study, we evaluated perceived stress among medical students including its sources such as psychosocial, academic performance, familial factors which may be of great importance to students as well as their teachers to improve their academic achievement. In the current study the prevalence of stress among medical students is 54.8%, in studies done by Sherina et al; (2003) and Zaid and Chan (2007) prevalence of stress among medical students ranged from 30% to 50% which reveal that our study have a higher prevalence of stress among medical students [12, 13]. Additionally, a prevalence of 41.9% and 46.2% were measured in a Malaysian government medical school and in a Malaysian private medical school, which were less than our prevalence of stress in the current study [3]. Also, the current study showed that there is a highly statistical significance between year of study and stress, preparatory year and first year of medical studies are the two major years that compose the stress and then stress decreased with progress of study to the sixth year. One of the explanations for the increase stress among younger students could be that medical program may be even more competitive and stressful for students who are accepted [2]. Stress among medical students was perceived in our study by regression analysis, exam questions and all related curriculum activities showed a highly statistical significant difference between stressed and unstressed students. Shah et al; (2010) found that there was no statistical significant correlation between perceived stress and academic per-

formance compared to our study [14]. This might be among the students who are striving to perform well in examinations may make themselves stressed. Among academic stressors, tests/exams were the chief sources of stress. Those students who perceive tests/ exams as a burden may experience stressful situations, while for others, who consider exams useful and help them in their learning. In our study recreational facilities was revealed as one of the prominent factors of stress among medical students with a highly statistical significance difference among stressed and unstressed medical students. Redwood and Pollak (2007) found that psychosocial factors such as insufficient recreational facilities were an important source of stress [15]. In regression analysis there is a high Odds ratio of psychosocial and familial factors among our students in the current study, which might suggest a linear relationship between these factors and stress which reflect that students who have academic stress factors can have also psychosocial and familial factors. Overall prevalence of stress in this study was 53.3% in male student and 46.7% in female student. Our study concluded that male students have more stress than female. The stress caused undesirable effects on their general health. This might be because male students need to finish study with high scores and at optimum time to start their careers. In conclusion, medical students were more frequent victims of academic stress than other students. It was possibly due to their higher academic demands and perception of time constraints to fulfill them. Important causes of stress among medical students included unsuitable teaching methods; an unsatisfactory college study environment; fear of failure in examinations, and social problems all of which resulted in perceived anxiety and depression, negative life-style practices and a worse status of physical and mental health changes since the start of their college studies [14, 16, 17].

References

- [1] Gomathi KG, Ahmed S, Sreedharan J. *Psychological health of first-year health professional students in a Medical University in the United Arab Emirates*. Sultan Qaboos Univ Med J 2012;12:206-13.
- [2] Yusoff MSB, Abdul Rahim AF, Yaacob MJ. *Prevalence and sources of stress among University Sains Malaysia medical students*. Malays J Med Sci 2010;17:30-7.
- [3] Aktekin M, Karaman T, Senol YY, et al. *Anxiety, depression and stressful life events among medical students: a prospective study in Antalya, Turkey*. Med Educ 2001;35:12-7.
- [4] Myers DG. *Stress and health*. In: *Exploring Psychology* (6th ed.). New York: Worth Publishers 2005, p. 402.
- [5] Sharifirad G, Marjani A, Abdolrahman CH et al. *Stress among Isfahan medical sciences students*. J Res Med Sci 2012;17:402-6.
- [6] Dyrbye LN, Thomas MR, Shanafelt TD. *Systematic review of depression, anxiety, and other indicators of psychological distress among US and Canadian medical students*. Acad Med 2006;81:354-73.
- [7] Firth J. *Levels and sources of stress in medical students*. Br Med J (Clin Res Ed) 1986;292:1177-80.
- [8] Stewart SM, Lam TH, Betson CL, et al. *A prospective analysis of stress and academic performance in the first two years of medical school*. Med Educ 1999;33:243-50.
- [9] Willcock SM, Daly MG, Tennant CC, et al. *Burnout and psychiatric morbidity in new medical graduates*. Med J Aust 2004;181:357-60.
- [10] Polychronopoulou A. *Perceived sources of stress among Greek dental students*. J Dent Educ 2005;69:687-92.
- [11] Frick LJ, Frick JL, Coffman RE, et al. *Student stress in a three-year doctor of pharmacy program using a mastery learning educational model*. Am J Pharm Educ 2011;75:64.
- [12] Sherina MS, Lekhraj R, Nadarajan K. *Prevalence of emotional disorder among medical students in a Malaysian University*. Asia Pac Fam Med 2003;2:213-7.
- [13] Zaid ZA, Chan SC, Ho JJ. *Emotional disorders among medical students in a Malaysian private medical school*. Singapore Med J 2007;48:895-9.
- [14] Mohsin S, Hasan S, Malik S, et al. *Perceived stress, sources and severity of stress among medical undergraduates in a Pakistani medical school*. BMC Medical Education 2010;10:2.
- [15] Redwood SK, Pollak MH. *Student-led stress management program for first-year medical students*. Teach Learn Med 2007;19:42-6.
- [16] Gentile JP, Roman B. *Medical student mental health services*. Psychiatry (Edgmont) 2009;6:38-45.
- [17] Shapiro SL, Shapiro DE, Schwartz GE. *Stress management in medical education: a review of the literature*. Acad Med 2000;75:748-59.

■ Received on May 16, 2013. Accepted on October 22, 2013

■ Correspondence: A.G. Abdel Rahman, Faculty of Medicine, Community, Environmental and Occupational Medicine Department, Suez Canal University - E-mail: amiragamal2@hotmail.com