Stress and stress factors among medical students in Bulgaria

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Abstract

Aim: To assess the stress levels and the sources of stress among medical students in Medical University-Sofia. Gender and other differences were taken into account.
Methods: A cross-sectional study with a specially designed questionnaire was carried out. For studying the stressors, it was used an inventory called Medical Student Stressor Questionnaire. The study was carried out in 2013 at the Department of Social Medicine, Faculty of Public Health-Sofia. In the study took part 150 medical students in the second course and 128 students in the sixth course. Descriptive analysis was performed. Relation between variables was assessed with chi-square test with a significance level of $P \leq 0.05$.
Results: Moderate to severe stress was experienced by 78.4% of the medical students. High and severe stress was declared by 20.1% of the students. High to severe stress was reported by 21.4% of the females and 18.2% of the males. Academic related stressors caused high to severe stress in 59.7% of the students.
Conclusion: Academic related stressors were the main cause of stress both for the second and the sixth year students. A gender difference regarding stress levels was observed, where women reported higher levels of stress than men. There was no statistically significant difference in stress between second and sixth year students. We recommend more detailed future investigation of stress factors in Bulgarian medical students in order to introduce stress management programs.

Keywords: medical students, MSSQ, sources of stress, stressors.

Introduction

Many studies have shown that the level of stress in medical students is really high (1-5). High levels of stress are associated with risk for developing depression, burnout, suicide, alcohol and substance abuse, and problems in medical marriages (6-14). Researchers differ in their opinion about the course of study in medicine with the highest stress. Some studies have found that stress during medical education is rather constant and chronic, than episodic (9,15-19).

The same stressors may be perceived in different way by different medical students depending on their personalities, motivation, experience, coping skills and year of education (20-22).

This study was carried out due the lack of information about stress in Bulgarian medical students. It is important to identify the stressors in medical students and make attempts to reduce stress and prevent future psychological problems (23).

Methods

This study was conducted to determine the prevalence of stress among medical students in Bulgaria and the sources of their stress. Students were asked to complete a specially designed anonymous self-administered questionnaire. Part of this questionnaire was an inventory called MSSQ (Medical Student Stressor Questionnaire). MSSQ is a valid and reliable instrument with good psychometric properties (24,25). Stressors according to MSSQ are divided into six groups: ARS (Academic related stressors),TLRS (Teaching and learning related stressors), IRS (Intrapersonal and interpersonal related stressors), SRS (Social related stressors), DRS (Drive and desire related stressors), GARS (Group activities related stressors). In this study, the short version of MSSQ was used, which consists of 20 items. To indicate intensity of stress, the items in MSSQ are rated in five response categories (causing no stress at all, causing mild stress, causing moderate stress, causing high stress, and causing severe stress). The scoring method is that the least intensity of causing stress items score 0 and the most intensity of causing stress answers score 4, i.e. 0-1-2-3-4 (24).

Subjects in our cross-sectional study were students in their second and sixth year of medical education. The same questionnaire was used for both groups. The questionnaire was distributed in April 2013 during practical exercises in Social Medicine (for the second course students). Medical students in the sixth course completed the questionnaire during governmental practice lectures in Social Medicine in 2013. The study was conducted in the Department of Social Medicine, Faculty of Public Health, Sofia. In the study took part 150 medical students in the second course (78 women and 72 men) and 128 students in the sixth course (76 women and 52 men). Response rate was 90.9% for students in the second course (150/165) and 75.3% for students in the sixth course (128/170).

Statistical analysis included descriptive statistics (mean value and standard deviation); chi-square test to assess the association/correlation between stress level and demographic data (Pearson's product moment correlation coefficient and Kendall's tau), and; t-test (Welch Two Sample t-test) for assessment of differences between mean values. It is accepted that p-value is significant at a level of ≤ 0.05.

Results

In this study, moderate to severe stress was experienced by 78.4% of the medical students. High and severe stress was declared by 20.1% of the students. In the second course, 74.7% of medical students experienced moderate to severe stress and 21.3% declared high to severe stress. In the sixth course, moderate to severe stress had 82.8% of the students and high to severe stress 18.8% of the students. There was no statistically significant difference in stress levels between the second and the sixth course students (P=0.43). The only exception was the domain of TLRS, where sixth course medical students experienced more stress (P=0.02). Women comprised 55.4% of the participants in this study. Female medical students declared more stress than males. Moderate to

severe stress was experienced by 89.3% of the females and by 61.8% of the males. High to severe stress was reported by 21.4% of the females and 18.2% of the males. A statistically significant difference in stress experienced by sex was observed (P=0.004). In this study, 69.1% of medical students were not from physicians' families. There was no statistically significant difference in stress according to having a parent physician (P=0.35). Table 1 presents the associations between stress and different variables.

Six from the top ten stressors for medical students in this study were academic related stressors (Table 2). Tests and examinations were the leading cause of stress. They caused moderate to severe stress in 84.2% and high to severe stress in 61.2% of the medical students. Falling behind in reading schedule caused moderate to severe stress in 73.4% and high to severe stress in 52.5% of the students. Large amount of content to be learned caused moderate to severe stress in 69.1% and high to severe stress in 46.8% of the students. In

Table 1. Stress by sex, parents and academic year (p-values from the t-test)

Stress domain	By year of study	By parent physician	By sex
ARS	0.9766	0.3008	0.0016
IRS	0.4246	0.8677	0.5671
TLRS	0.0178	0.5055	0.0987
SRS	0.3557	0.3561	0.0298
DRS	0.501	0.9711	0.7182
GARS	0.2185	0.4794	0.0001
All	0.4262	0.3514	0.0037

Table 2. Top ten stressors ranked by mean degree of stress as perceived by medical students

Rank	Mean	SD	Cause of stress	MSSQ domain
1	2.76	1.19	Tests/examinations	ARS
2	2.42	1.19	Falling behind in reading schedule	ARS
3	2.27	1.20	Large amount of content to be learned	ARS
4	2.21	1.28	Lack of time to review what have been learned	ARS
5	1.92	1.15	Heavy workload	ARS
6	1.67	1.25	Unable to answer questions from patients	SRS
7	1.65	1.28	Getting poor marks	ARS
8	1.63	1.19	Facing illness or death of the patients	SRS
9	1.60	1.37	Feeling of incompetence	GARS
10	1.47	1.26	Lack of recognition for work done	TLRS

Degree of stress: 0-1 is "causing nil to mild stress", 1.01-2.00 is "causing mild to moderate stress", 2.01-3.00 is "causing moderate to high stress", 3.01-4.00 is "causing high to severe stress" (According to MSSQ).

Table 2 are shown the top 10 stressors for the medical students.

Academic related stressors were the main cause of stress for both female and male medical students (Figure 1). ARS caused high to severe stress in 59.7% of the students (Table 3). The least stress was caused by the DRS domain stressors, where only 5% of medical students declared high and severe stress (Figure 1 and Table 3).

Stress experienced by medical students in the different domains of the MSSQ is shown in Table 3.

In this study, 25.9% of the medical students reported thoughts about quitting studies in medicine (24% in the second course and 28.1% in the sixth course). Although more students who had considered quitting experienced stress, the difference was not statistically significant (P=0.32). There was statistically significant difference between stress and the fear of failure (P=0.0004). Fear of failure was declared by 64.8% of the medical students. High and severe stress

Figure 1. Mean stress level by MSSQ domains and sex

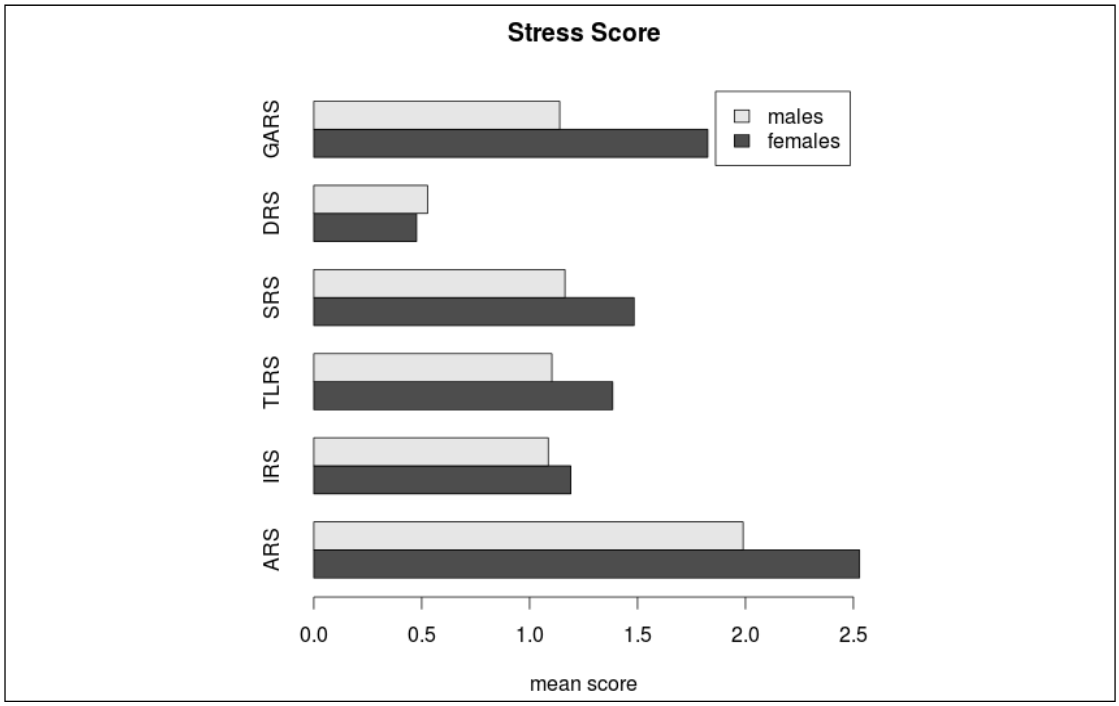

Table 3. Stress distribution (levels in percent) by MSSQ domains

Domain	Mild (%)	Moderate (%)	High (%)	Severe (%)
ARS	10.1	30.2	38.8	20.9
IRS	58.3	20.9	15.8	5.04
TLRS	49.6	30.2	18.7	1.44
SRS	43.9	37.4	18.0	0.72
DRS	83.5	11.5	4.3	0.72
GARS	40.3	32.4	20.1	7.2
Stress level	21.6	58.3	19.4	0.72

because of verbal or physical abuse from teachers was reported by 20% of medical students, and an abuse from personnel caused high and severe stress in 12.9% of the students.

Discussion

This study found that the prevalence of distress among Bulgarian medical students is high. Stress levels ranged from 78.4% (moderate to severe stress) to 20.1% (high and severe stress). The finding in our study is consistent with the results of previous studies. According to other studies, the prevalence of distress among medical students is high, ranging from 21% to 56% (3,23,25-28). Most studies conclude that female medical students experience more stress than their male colleagues, which is confirmed by the result in this research (29-31). However, some studies do not show difference in stress levels between sexes (3,4).

Academic related stressors include examinations and tests, assessment methods and getting poor marks, large amount of content to be learned, difficulties to understand the content, lack of time to review what have been learnt, difficulties to answer questions from the teachers, heavy workload, or falling behind in reading schedule (25). This study shows that the academic stressors are the leading cause of stress for Bulgarian medical students. This result is similar to the report of other studies, which have concluded that the major stressors for medical students are academic-related (3,28,32). Six of the top ten stressors in this study were academic related. We should mention the fact that the data in this study were not collected during examination period. We assume that the academic related stressors would cause even more stress if the research is performed immediately before examinations. The high level of ARS highlights the importance for relieving the academic stress in Bulgarian medical students. It would be good if some changes in the curriculum were considered. Some authors suggest that students' psychological well-being is improved through introducing pass/fail grading system (33-35). The design of the curriculum can induce unacceptable stress or can bring the best out of students. Further research in this area is important. The rank of the top stressors in the ARS division may be different from that of the other studies (9,23,36,37).

It is interesting to highlight that GARS are the second leading cause of stress for Bulgarian medical students. In this group, as stressors according to MSSQ-20 are considered "the need to do well imposed by others" and a "feeling of incompetence". The feeling of incompetence could be a consequence of the way in which the study process is organized and the quality of medical education. This feeling can result in dissatisfaction with studying medicine, anxiety, hopelessness, and loss of meaning for studying medicine. The students' discomfort with competence and lack of confidence in their clinical skills are associated with burn-out and mental disorders (38,39). This can lead some students to consider dropping out of the medical education. We recommend future research about the link between the feeling of incompetence and burn-out. It is important to identify early enough the students with possible future mental health problems, so they could be involved in programs for stress management.

SRS refer to inability to answer questions from patients, talking to patients about personal problems and facing illness or death of patients. TLRS refer to not having enough feedback from teachers, uncertainty of what is expected from the students and lack of recognition for the work done. In this study, two of the top ten stressors were from the domain of the SRS and one was from TLRS. In our study, high and severe stress from facing illness or death of the patients was declared by 25.2% of the students. Medical students are not adequately prepared and trained how to talk with dying patients. It is a pity that the study program in medical university is mainly focused on diagnostic and treatment of diseases. It is not surprising that because of the lack of training in the area of dying and palliative care, students feel anxious, sad and stressed when they are faced with death. For

decreasing stress caused by SRS we recommend the curriculum of the medical university to include training and education about how to communicate with dying patients and their families and care for terminally ill individuals (40-43).

IRS include verbal or physical abuse by other students, abuse by teachers and personnel, conflicts with teachers and personnel and poor motivation to learn. The motivation for learning highlights the problem about selection criteria for entering in the Medical University. Selection process in Bulgaria is based only on academic criteria and the admission process does not take into account the personality of future doctors and their motivation. We recommend the selection of medical students to be based on various criteria, including personal qualities, interests and motivation (44,45). The problem of abuse highlights the need of decreasing this serious cause of stress in medical students through anti-bullying policies in medical schools. The abuse with students influences the specialty choice of medical students, has a detrimental effect on their care for patients and leads to anxiety, depression, low self-esteem and substance abuse (46).

DRS are related to unwillingness to study medicine, or parental wish to study medicine. In this study, DRS caused the lowest level of stress for medical students. The same result is seen in another study (47).

This study has some limitations. The short version of MSSQ is used and we assume that if the MSSQ-40 questionnaire is applied, some new stressors may arise. Personal life events and financial problems were not studied as possible stressors in this study. This could be an area of further research. Other limitation is that the study population involved only students in the second and the sixth course in Medical University-Sofia. Hence, the results cannot be generalized to all years of studying medicine and to all universities in Bulgaria.

In conclusion, it is important to identify the stress factors and the stressed medical students. This will help developing programs for the improvement of the psychological well-being of the students. Stress management approaches and courses should be integrated in the Bulgarian medical education.

Conflicts of interest: None declared.

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