

GENDER DIFFERENCES IN ACADEMIC STRESS AND BURNOUT AMONG MEDICAL STUDENTS IN FINAL YEARS OF EDUCATION

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SUMMARY

Background: The educational process brings a considerable amount of stress to medical students that can influence mental health status and contribute to further professional burnout. The authors assessed the academic stress influences, mental health status and burnout syndrome, with the intent to find different patterns in female and male medical students.

Subjects and methods: The applied cross sectional study was in the form of an anonymous questionnaire which included: socio-demographic data, self-reported health status and influence of studying activities on stress level in 755 medical students who attended two final years. Mental health status was explored by the General Health Questionnaire (GHQ-12), and Maslach Burnout Inventory (MBI).

Results: Female students assessed their physical health status and general stress level as worse compared to males ($p < 0.001$). Exams were described as a high stressor in about 50% of all examined students. However, this stressor was significantly more frequent in female students ($p < 0.001$). Female students frequently declared high stressful effects of contacts with patients ($p = 0.009$) and autopsy ($p < 0.001$). The scores of the GHQ-12 questionnaire were above the threshold or high in 51.5% of all students, and also significantly higher in females ($p = 0.001$). High scores were found among 52.6% of all examined students on MBI subscale of Depersonalization, and 33.6% on MBI subscale of Emotional exhaustion without gender difference.

Conclusion: Measures for prevention of academic distress should be targeted at optimization of the educational process, development of the clinical skills and professionalism, with special concern to female students who manifested high vulnerability.

Key words: stress - mental health - burnout syndrome - medical students

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INTRODUCTION

Medical undergraduate education is a long process where students face multiple stressors such as common academic overload, lack of leisure time, emotional pressure to maintain good grades, and specific conditions of learning complex medical procedures while working concurrently with patients (Masten et al. 2009, Toševski et al. 2010). Resulting distress has adverse effects on professional development, and can produce decline in empathy and humanitarian attitudes among medical students (Stewart et al. 1999, Hojat et al. 2004). Results obtained from the study conducted in Slovenia failed to show significant differences in strategies of coping with stress between medical and other students (Masten et al. 2009).

Several studies have revealed that student's mental health has special issues, and can even deteriorate during the study of medicine (Gutrie et al. 1998, Tyssen et al. 2001, Roberts et al. 2001, Dahlin & Runeson 2007). By using the questionnaire GHQ-12, the signs of distress were found in 22–36% of students, and documented psychiatric morbidity in 16% in the longitudinal sample of medical students. (Gutrie et al. 1998). The mental health status of medical students from Belgrade, explored one month after enrollment and checked two years later, showed prevalence rates of all mental disorders of 16.1% and 17.5%, respectively.

(Erić et al. 1988). In the recent surveys conducted at the Schools of Medicine (155 students) and Pharmacy (101 students), University of Belgrade, the symptoms of anxiety and depression were more frequent in the medical student sample, and female medical students manifested marked personal sensitivity (Obradović et al. 2009).

Studies show that female students and residents had higher level of anxiety and depression compared to their male counterparts (Lloyd & Gartrell 1981). Higher anxiety in female students could be explained by specific psychosocial profiles and warrant further investigation (Hojat et al. 1999)

Burnout syndrome denotes particular work-related adverse reactions strongly associated with decreased physicians' professional performance and low career satisfaction. The incidence of burnout syndrome among practitioners in Serbia and worldwide ranged from 25% to 76% depending on medical specialty, and was more common in the population of young doctors (Ćurčić & Ćurčić 2009, Lešić et al. 2009, Vićentić et al. 2010, Shanfelt et al. 2002). Nowadays, burnout is considered as a measure of distress in the educational process, and recently has been discovered in up to 50% of medical students, with the incidence increasing during the length of their studies (Dyrbye et al. 2009). In this study, the authors assessed the academic stress influences and adverse effects on mental health in the form of

psychological distress and burnout syndrome among female and male students attending the two final years of medical studies.

SUBJECTS AND METHODS

Subjects

This cross sectional study comprised all students of the fifth and sixth year at the School of Medicine in Belgrade during 2010 and 2011. Out of 482 students attending the fifth year, 375 responded (response rate 77.8%) and among the 500 registered students attending the sixth year, 380 responded to voluntary anonymous questionnaire (response rate 76%). The questionnaire contained: selected socio-demographic data with specific questions referring to the effectiveness of the studies (length of study, number of passed exams and mean grades).

Methods

Course stress questionnaire comprised: examinations, contact with patients, autopsy, relation with teaching staff, and questions regarding the general level of stress at the moment of investigation. Students were asked to note their own perception of stress on the 4-point Likert scale (0= no stress, 1= mildly stressful, 2 = moderately stressful, 3= very stressful)

The effect of distress and the consequences to mental health were estimated by the 12-item General Health Questionnaire, offering four different categories of answers (graded from better than usual, as usual, less than usual, to much less than usual) (GHQ-12) for measuring the feeling of tension, depression, inability to defend, disturbed sleep based on anxiety, lack of self-confidence and self-esteem and other symptoms of mental health disturbance. The standard method of

scoring 0-0-1-1 by four-level scale for each item was used and allowed the maximum score of 12. The GHQ-12 questionnaire has well-established validity in young population and student samples (Goldberg & Williams 1988, Radovanović & Erić 1983).

The Maslach Burnout Inventory (MBI) is a 22-item self-report questionnaire and widely used measure of burnout in relation to occupational stress (Maslach et al. 1996). In this study, MBI was modified in the way that it included specific questions covering the medical course items. Possible answers were categorized into seven categories (0 - never, 1 - several times a year or less, 2 - once a month or less, 3 - several times a month, 4 - once a week, 5 - several times a week, 6 - every day). The MBI measures three subscales: emotional exhaustion (MBI-Ee) (feeling emotionally drained by work, by 9 items), depersonalization (MBI-Dp) (feeling detached and uninvolved, measured by 5 items), and personal accomplishment (MBI-Pa) (feelings of low competence and achievement, by 8 items). The total score for each subscale is categorized 'low', 'average' or 'high' according to determined cut-off scores based on normative data from the sample of the American health professionals, proved among the Serbian population (Maslach et al. 1996, Vićentić et al. 2009, Lešić et al. 2009).

The study has been reviewed and granted the approval by the Ethics Committee of the School of Medicine in Belgrade.

Statistical analysis

Continuous variables were described as means \pm standard deviation (SD), and categorical variables were presented by counts and percentages. Multivariate logistic regression analysis was used for data processing. Data were analyzed using the SPSS package version 17 with the significance level set at 0.05.

Table 1. Demographic characteristics, study success and self-assessed health status

	Males (n=240)	Females (n=515)	Both (n=755)	
Age	24.8 \pm 1.9	24.9 \pm 1.8	24.8 \pm 1.9	t=0.494; df=751 p=0.621**
Length of studying	5.8 \pm 1.6	5.9 \pm 1.6	5.49 \pm 1.6	t=0.168; df=747 p=0.867**
Passed exams	32.3 \pm 5.4	33.1 \pm 6.1	32.9 \pm 5.9	t=1.628; df=663 p=0.104**
Average grades (6-10)	8.5 \pm 0.7	8.3 \pm 0.7	8.4 \pm 0.7	t=2.187; df=726 p=0.029**
Mental health				
No change	114 (47.9%)	223 (43.9%)	337 (45.2%)	$\chi^2=4.120$ df=2 p=0.127*
Better	41 (17.2%)	70 (13.8%)	111 (14.9%)	
Worse	83 (34.4%)	215 (42.3%)	298 (39.9%)	
Physical health				
No change	121 (50.8%)	214 (42.0%)	335 (44.8%)	$\chi^2=19.090$ df=2 p<0.001*
Better	31 (13.0%)	33 (6.5%)	64 (8.6%)	
Worse	86 (36.1%)	262 (51.5%)	348 (46.6%)	

* χ^2 significance; **t test significance

RESULTS

Mean age of students presented in Table 1 ranged usually between 23-27 years with no significant difference between genders (24.8±1.9 vs. 24.9±1.8; $p=0.621$). An average length of study at the time of testing was 5.49±1.6 years and was uniform for both gender groups. The majority of students passed 28-39 exams at the time of testing, with the average grades of 8.4±0.7 (on the scale ranging from 6-10). The state of mental health was recorded as worse than before in 39.9% for both genders, while the physical health of female students was reported more often as worse than before the enrollment (51.5% vs. compared 36.1% males, $p<0.001$) (Table 1).

Approximately one half of females vs. only one third of males reported their own general stress level as moderate or elevated ($p<0.001$). The exams were marked stressor in more than a half of students, more frequently in females than in males (58.2% vs. 33.3%; $p<0.001$). Stressful effects of communication with the faculty staff were assessed usually as mild; however, female students expressed moderate stress in this activity more often (16.6% vs. 11.8% of females). Contacts with patients was defined most frequently as

an activity with no stressful effects in male students (60.8%), while females more often stated this as moderately and highly stressful ($p=0.009$). Female students considered autopsy as highly stressful activity (16% vs. of 6.8% males; $p<0.001$) (Table 2).

Mean value of GHQ-12 test scores was 2.58±2.71 in female students versus 1.93±2.44 of males, $p=0.001$. Scores above the threshold were recorded in 24.8% of all students, and the examined scores were rated as high in 26.7%.

Scores of the Ee subscale of MBI were on average 22.49±10.96, with the uniform distribution in low, moderate and high scores in both genders. Values on the subscale Dp were on average 13.43±5.61, and generally high in 57.9% of male and 50.1% of female students. An average value of Pa score was 31.50±14.91. In the burnout assessment, high scores in Depersonalization scale (MBI -Dp) were present in 52.6% and in Emotional exhaustion scale (MBI -Ee) in 33.6% of all the respondents (Table 3).

According to multivariate logistic regression analysis, autopsy and exams seemed to be independent stressful factors in the female student population (OR=2.13; 95%CI: 1.12 – 4.02 and OR=2.0; 95%CI: 1.34 – 3.02) (Table 4).

Table 2. Perceived stressful effect of selected study activities

	Males	Females	Both	
General stress level (n) %	214	456	670	
No	100 (46.7%)	135 (29.6%)	235 (35.1)	$\chi^2=19.761$ df=3 $p<0.001$
Mild	50 (23.4%)	123 (27.0%)	173 (25.8%)	
Moderate	40 (18.7%)	127 (27.9%)	167 (24.9%)	
High	24 (11.2%)	71 (15.6%)	95 (14.2%)	
Exams (n) %	237	512	749	
No	34 (14.3%)	28 (5.5%)	62 (8.3%)	$\chi^2=54.832$ df=3 $p<0.001$
Mild	39 (16.5%)	32 (6.3%)	71 (9.5%)	
Moderate	85 (35.9%)	154 (30.1%)	239 (31.9%)	
High	79 (33.3%)	298 (58.2%)	377 (50.3)	
Communication with the teaching staff (n) %	237	511	748	
No	118 (49.8%)	187 (36.6%)	305 (40.8%)	$\chi^2=12.452$ df=3 $p=0.006$
Mild	76 (32.1%)	207 (40.5%)	283 (37.8%)	
Moderate	28 (11.8%)	85 (16.6%)	113 (15.1%)	
High	15 (6.3%)	32 (6.3%)	47 (6.3%)	
Contact with the patients (n) %	237	510	747	
No	144 (60.8%)	249 (48.8%)	393 (52.6%)	$\chi^2=11.407$ df=3 $p=0.009$
Mild	73 (30.8%)	201 (39.4%)	274 (36.7%)	
Moderate	19 (8.0%)	48 (9.4%)	67 (9.0%)	
High	1 (0.4%)	12 (2.4%)	13 (1.7%)	
Autopsy (n) %	235	511	746	
No	136 (57.9%)	203 (39.7%)	339 (45.4%)	$\chi^2=25.325$ df=3 $p<0.001$
Mild	50 (21.3%)	131 (25.6%)	181 (24.3%)	
Moderate	33 (14.0%)	95 (18.6%)	128 (17.2%)	
High	16 (6.8%)	82 (16.0%)	98 (13.1%)	

* χ^2 significance

Table 3. Distribution of the GHQ 12 and MBI subscale scores

GHQ	Males (234)	Females (503)	Both (737)	
Low score	130 (55.6%)	227 (45.1%)	357 (48.4%)	$\chi^2=7.697$ df=2 p=0.021
Above threshold score	54 (23.1%)	129 (25.6%)	183 (24.8%)	
High score	50 (21.4%)	147 (29.2%)	197 (26.7%)	
MBI-Ee	Males (233)	Females (503)	Together (736)	
Low score	83 (35.6%)	175 (34.8%)	258 (35.1%)	$\chi^2=1.224$ df=2 p=0.542
Moderate score	78 (33.5%)	153 (30.4%)	231 (31.4%)	
High score	72 (30.9%)	175 (34.8%)	247 (33.6%)	
MBI-Dp	Males (235)	Females (507)	Together (742)	
Low score	24 (10.2%)	60 (11.8%)	84 (11.3%)	$\chi^2=3.902$ df=2 p=0.142
Moderate score	75 (31.9%)	193 (38.1%)	268 (36.1%)	
High score	136 (57.9%)	254 (50.1%)	390 (52.6%)	
MBI-Pa	Males (234)	Females (492)	Together (726)	
Low score	112 (47.9%)	248 (50.4%)	360 (49.6%)	$\chi^2=1.868$ df=2 p=0.393
Moderate score	65 (27.8%)	146 (29.7%)	211 (29.1%)	
High score	57 (24.4%)	98 (19.9%)	155 (21.3%)	

* χ^2 significance

Table 4. Independent risk factors according to multivariate logistic regression analysis

Variable	Males (n) %	Females (n) %	OR (95%CI)	p**
High stressful influence of the exams	237	512		
No	158 (66.7%)	214 (41.8%)	2.0 (1.34 – 3.02)	0.001
Yes	79 (33.3%)	298 (58.2%)		
High stressful influence of the autopsy	235	511		
No	219 (93.2%)	429 (84.0%)	2.13 (1.12 – 4.02)	0.021
Yes	16 (6.8%)	82 (16.0%)		

**Multivariate logistic regression analysis

DISCUSSION

This study presented the academic stress influence and mental health status in the first generation of students enrolled according to new Bologna curriculum from the very beginning of their medical course. The School of Medicine of Belgrade University introduced, eight years ago, a new curriculum trying to be in the line with other European University Schools of Medicine. Students in the final years of medicine had passed the majority of and exams and have already faced all kind of preclinical and clinical activities. This population was chosen as the representative of the cumulative academic stress exposure. We have recorded a relatively good success in exams and also a relatively poor state of self-estimated physical and mental health, particularly in the female student population. In recent studies, psychosomatic complaints, have been the most important factor in formation of students' self-rated health status (Mikolajczyk et al. 2008, Obradović et al. 2009).

About one half of female and one third of male students in our study estimated their own general stress level as moderate or high. As in recently found specific gender differences in behavioral and health patterns (Ziherl & Masten 2010, Voltmer et al. 2010), we have also found some gender differences in the self perception of physical health and stress effects of particular academic activities. Confirmed sources of

academic stress include the exams and elements of assessments from the curricula (Kipping 2000). Examinations were most frequently perceived as high stressor (in more than half of all observed students), also significantly more in females, and proved as an independent stress factor in multivariate regression analysis particularly in the female student population. As stated before, female medical students reported higher level of anxiety in multiple-choice examinations (Pamphlett & Farmill 1995). Female students manifested more stress effects in communication with the faculty staff and also often stated for contacts with patients to be stressful. Autopsy was considered more than twice as often highly stressful by female students, and appeared to be an independent predictor of stress in the female population. In the recently conducted survey at the School of Medicine in Belgrade, significant interpersonal sensitivity was observed more frequently in female students (Obradović et al. 2009).

In applying the GHQ-12 questionnaire as a measure of the mental health disturbance, the mean score was slightly higher in this student sample compared to that recorded in population of general practitioners and psychiatrists of Serbia (1.37±2.27 and 1.63±2.28), and then among medical students from Hungary (2.15±1.36) (Vičentić et al. 2010, Biro et al. 2010). The symptoms of anxiety and depression could be found in population of medical students with the prevalence of 25-58%

depending on the study design and applied method (Dunn et al. 2008). High incidence of perceived psychological symptoms and self-perception of poor health status in medical students could be a tendency to identify themselves with medical cases. The phenomenon of this tendency is called: 'medical school syndrome' or 'medical students' disease' (Collier 2008). In our study, cut-off score for GHQ-12 (Radovanović & Erić 1983) established in the medical student population in Belgrade three decades ago (as 1/2, with positive predictive ratio of 40.4% for mental disturbance) was achieved in 44.5% of male and 54.8% female medical students. In previous studies, no gender difference was recorded by means of any psychological distress questionnaire; however, upon assessing their later postgraduate studies, female doctors reported higher rates of distress (Ramirez et al. 1996, Gutrie et al. 1997, Gutrie et al. 1998). In our study, high cut-off score of 3/4 (which was given a positive predictive value for mental disturbance in 54%, in the study of Gutrie et al. 1998) was called a 'high score' and was present in 29.2% of female and 21.4% of male medical students. Gutrie et al. (1998) concluded that if the GHQ-12 was used as a screening test with this criterion, about a half of those having scored above the threshold would be actually without psychiatric disorders, and another type of secondary screening would have to be used to identify students with serious psychological difficulties. In the previous study conducted among medical students in Belgrade, the incidence rate of psychiatric disorders was 5.3% per year, with neurosis being the most frequent diagnosis (3.5%) (Erić et al. 1988).

Firth-Cozens found that 22% of fourth-year students had psychological symptoms both as students and as house practitioners, when they were followed up 2 years later, which suggested the hypothesis that practitioner distress and burnout started as early as during the academic years (Firth-Cozens 1987).

Present subscale scores of MBI questionnaire were also slightly higher than those among medical students from the USA, especially comparing Depersonalization subscales most relevant for students' clinical years (Dyrbye et al. 2006). Compared to findings for orthopedic surgeons from the University Clinical Centre, and general practitioners from the primary health care centers in Belgrade, where about 70% of the physicians in both groups had high scores of emotional exhaustion, our medical students in the final years had lower values on this subscale, and even two fold greater values in the Depersonalization subscale. Similar findings were found in Belgrade psychiatrists. They could be explained by poor personal relations in the present working and academic environment (Vićentić et al. 2010). Somewhat better results, with the lower incidence of high values in the depersonalization subscale scores, were present in our female student group.

Women now constitute a substantial portion of the medical student population as well as the physician work force in Serbia and surrounding countries. A

number of studies found a difference in the mental health status among male and female medical students (Lloyd & Gartrell NK 1981, Ramirez et al. 1996, Gutrie et al. 1997, Gutrie et al. 1998, Hojat et al. 1999). Dunn et al. (2008) suggested that female students often had better social support and showed rational choices regarding life priorities. This could be protective as far as burnout is concerned, but juggling between many social roles outside the faculty wastes energy and time necessary for learning and resting, which could be the reason for greater distress in professional demands.

The learning environment is generally important for achievement and it also has a profound impact on student's burnout (Tyssen et al. 2001). A multicenter study conducted in five medical schools in USA, concluded that personal characteristics, life events, and shared learning environment were independently related to burnout. A critical factor of burnout was found to be student's satisfaction with specific characteristics of the learning environment (OR 1.36 – 2.07) (Dyrbye et al. 2009).

Personality is the main intrinsic factor that predicts a considerable range of variance of burnout among medical students. (Luc et al. 2010). Some authors advocate that personality traits of the university students should be assessed at the beginning of their academic studies with the intent to screen possible early problems of the mental health (Lievens et al. 2002). University administration should make an effort to alleviate student stress, trying to improve their mental and emotional well-being and adopt strategies intended to lessen potentially traumatic stressors (Collier 2008). Burnout can be prevented, but this requires additional education as well as a number of structural changes of the system (Sartorius 2009). Initiatives to promote support and self-efficacy are likely to enhance students' well-being. The exams were the greatest stressor in the observed group of medical students. Considering this finding, the whole examination process should be reevaluated. Recognition of relations with the faculty teaching staff as the second common academic stressor in our study, institutional efforts to build relationships between the students and the faculty will have crucial importance. Academic institutions should also consider the implementation of faculty development programs to teach educators about how to optimize the learning environment. A good relationship with teachers encourages autonomy, clarifies the role expectations and helps in students' self-determination (Reio et al. 2009). It was found that student's engagement and assisted learning of practical skills had positive influence on their well being. This finding suggests student's expectations and desire to work hard in the supportive environment that promotes their professional development (Steele & Fullagar 2009). Medical school should provide graduates with the skills necessary to assess prejudices toward patients, lack of confidence and personal distress, which are essential to maintain perspective, professionalism, and resilience through the course of a career (Dyrbye et al.

2006, Marić et al. 2009). Special programs about the variety of professional and personal stressors and how to access to supporting systems to help students to address these challenges (for instance confidential resources for treatment of depression) are needed (Rosenzweig et al. 2003).

The presented paper shows the first findings of the academic distress and burnout among medical students in Serbia. However, this study has some limitations. Only academic stressors, as proved major and common factor of influence were assessed, while some students may have specific personality traits and coping strategies, or even gender specific stressful personal events, that could also influence the mental health and contribute to burnout (Dyrbye et al. 2006).

CONCLUSION

High prevalence of psychological distress among students at the end of their medical studies suggests a need to apply the measures of mental health promotion from the very beginning of their medical course. Students' mental health problems could have former undetected history, and it is important to follow and recognize the critical moments in their academic process.

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