Personality factors associated with academic stress in first year medical students

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Abstract. Objective: This study was designed to examine the relationship among medical students' personality profile and academic stress and to validate on a Romanian sample the Medical Student Stressor Questionnaire MSSQ. Material and Methods: A total of 267 (90%) first year medical students from the Romanian section responded to the survey. Results: The Romanian version of MSSQ has good psychometric qualities. The top stressors as showed by MSSQ are exams, falling behind in learning schedule, large amount of content to be learnt, heavy workload and lack of time to review what have been learnt. Conclusion: Academic stress was predicted by trait anxiety, gender (female) and neuroticism

Key Words: academic stress, personality, medical students

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Introduction

Medical students suffer from high stress levels (Dahlin et al 2005; Compton et al 2008) Compared with students in other majors, medical students have additional stress due to their longer course of study, exposure to death and dying, and the strain from communicating with patients. Academic stress in medical students may be associated with poor academic performance (Stewart et al 1999), certain personality types (Vitaliano et al 1989), and depression (Ang & Huan 2006). The excessive stress can lead to physical and mental health problems (Niemi & Vainiomaki 1999), reduce self-esteem (Silver & Glicken, 1990), and affect their academic achievement and personal or professional development.

Studies have showed high prevalence of stress in medical students, ranging from 21% to 56%, particularly in the first year as they face difficult moments in adjustment to new environment of medical training (Firth 1986; Aktekin et al 2001; Dahlin et al 2005).

Personality is regarded as one of the strongest predictors of well-being. Emotional stability and extraversion are typically associated with happiness, well-being, and positive affect, and neuroticism is associated with distress, poor well-being, and negative affect (Diener et al 1999). The relationship between neuroticism and vulnerability to stress has been widely studied; however, the majority of studies specifically focus on medical post-graduate samples (Firth-Cozens 2003; McManus et al 2004) rather than medical students. Tyssen et al (2007) examined the relationship between extraversion, neuroticism, and conscientiousness and stress in medical students and found that those high on extraversion and low on neuroticism and conscientiousness were more protected against stress.

This study was designed to examine the relationship among medical students' personality profile and academic stress. We also aimed to validate on a Romanian sample an instrument designed to measure academic stress in medical students - The Medical Student Stressor Questionnaire MSSQ.

Material and Method

Participants

The study was conducted at the "Iuliu Hațieganu" University of Medicine and Pharmacy, during the academic year 2013-2014 in the first semester. A total of 267 (90%) first year medical students from the Romanian section responded to the survey.

Instruments

The Medical Student Stressor Questionnaire MSSQ is a validated instrument used to identify sources of stress (Yusoff, 2010, Yusoff 2011). The items in MSSQ represent 20 possible sources of stress in medical students identified from the literature grouped into six main domains; Academic Related Stressor (ARS), Intrapersonal and Interpersonal Related Stressor (IRS), Teaching and Learning Related Stressor (TLRS), Social Related Stressor (SRS), Drive and Desire Related Stressor (DRS), and Group Activities Related Stressor (GARS). Respondents were asked to rate each source by choosing from five responses, "causing no stress at all", "causing mild stress", "causing moderate stress", "causing high stress" and "causing severe stress". The scoring method assigns marks from 0 to 4 to each of the responses respectively.

The Big Five Personality Inventory Short Form (NEO FFI) was developed by Costa and McCrae (1992) and adapted to Romanian

language by Iliescu et al (2010). It consists of 60 items grouped into five subscales: Extraversion, Neuroticism, Agreeableness, and Openness to experience and Conscientiousness. Each subscale has 12 items. Respondents rated each item on a 5-point Likert type scale anchored by "fully false=1" and "fully true= 5". It is the most widely used and robust measure of personality traits with sound psychometric properties established by previous researchers (Costa & McCrae 1992).

To measure anxiety, we used the Romanian version of the State–Trait Anxiety Inventory (STAI) (Spielberg 2007). The STAI is comprised of two scales: the state and trait forms. Each scale consists of 20 items that indicate the presence or absence of anxiety symptoms. The State-Trait-Anxiety Inventory is one of the self-rating anxiety scales most commonly used in research and clinical practice.

Procedure

Written consent was obtained from the participants. Completion of the questionnaires was voluntary. Permission was obtained from the medical schools and Ethical Committee of University of Medicine and Pharmacy "Iuliu Hațieganu" prior to the start of the study. The questionnaire was distributed to students 2 months after the beginning of the first semester.

The Medical Student Stressor Questionnaire MSSQ was translated and validated in Romanian language with the author written permission.

Statistical analysis

Data were analysed using Statistical Package for Social Sciences (SPSS) version 20 for OS 10.9.1. Reliability analysis was performed to determine the reliability of the Romanian version of MSSQ questionnaire. Internal consistency of the items was measured by using Cronbach's alpha coefficient. Factor Analysis was done to determine the construct validity of the Romanian version of MSSQ questionnaire. Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity was applied to measure the sampling adequacy. Principal Component Analysis Method was applied in extraction of the component, followed by Varimax rotation. Distributions of the studied variables were examined using Shapiro-Wilk's tests. Statistical significance was assumed at $\alpha \leq 0.05$. Because the data wasn't normally distributed we used non-parametric statistics: Mann-Whitney U and Spearman correlation coefficients. Spearman correlations were used to investigate the relationship among personality variables and academic stress. Stepwise multiple regression analysis was used to examine the best predictors of academic stress.

Results

A total of 267 student responded. 181 (67.8%) were female students. Average age was 19 year in female students and 19.8 years in male students. 76.9% students' mothers' education and 70.9% students' fathers' education were higher education. 15.3% of the students had one of both parents physicians. Students' relationship status were 171 (64%) single and 96 (36%) in a relationship. Regarding living conditions: 48 (18%) students were living at home with the parents, 124 (46.4%) were living in the university campus and 95 (35.6%) were living in rented apartments in the city.

Table 1: Demographics characteristics of the sample

	men	women
sex (N, %)	86 (32.2%)	181 (67.8%)
age (Mean, SD)	19 (2.6)	19.8 (0.092)
Parents (N, %)		
doctors (yes)	41 (15.3%)	
mother, higher education	206 (76.9)	
father, higher education	190 (70.9)	
marital status (N, %)		
single	171 (64%)	
in a relationship	96 (36%)	
living situation (N, %)		
at home with the parents	48 (18%)	
university campus	124 (46.4%)	
rented apartment	95 (35.6%)	

Table 2: Assessment of household economic situation

	N	%
Living in very poor conditions	9	3.4
Can manage generally	47	17.6
Can afford everything needed for a normal life	196	73.4
Can consume without any restrictions	15	5.6
Total	267	100

74.4% of the students considered they could afford everything needed for a normal life.

The total Cronbach's alpha value of the MSSQ was .884. Table 3 showed the Cronbach's alpha for each stressor group, ranged from 0.704 to 0.902. This analysis suggested that the items of the stressors group were reliable as having high internal consistency. The sample was adequate as indicated by a KMO value of 0.864 and Bartlett's Test of sphericity being significant (p<0.001). The factor analysis showed that all the items have loading factor value more than 0.3.

The mean STAI-Y1 state anxiety score was 44.4 ($\pm$11.87) in female students and 40.58 ($\pm$10.1) in male students. The mean STAI-Y1 trait anxiety score was 45.99 ($\pm$10.67) in female students and 41.78 ($\pm$9.44) in male students. 35.1% of the students showed high state anxiety and 44.1% of the students showed high trait anxiety.

The stressors ranked based on the degree of stress they caused as perceived by the students is shown in Table 5. All the stressors were related to academic matters. The top stressors are exams, falling behind in learning schedule, large amount of content to be learnt, heavy workload and lack of time to review what have been learnt.

We performed correlations between academic stress and personality variables. STAI trait anxiety and neuroticism were significantly and positively correlated with academic stress. Conscientiousness and Extraversion were significantly and negatively correlated with academic stress.

Table 3: The reliability analysis and factor analysis of the Romanian version of MSSQ items based on the stressors groups

	Items	Stressor group	Factor loading	Factor	Cronbach's a
1	Tests/ examinations		0.547	1	
2	Falling behind in reading schedule		0.621	1	
3	Large amount of content to be learnt	Academic Related Stressor (ARS)	0.413	1	0.808
4	Lack of time to review what have been learnt		0.617	1	
5	Heavy workload		0.403	1	
6	Participation in class presentation		0.589	2	
7	Need to do well (imposed by others)	Group Activities Related Stressor (GARS)	0.492	2	0.704
8	Feeling of incompetence		0.399	2	
9	Unable to answer questions from patients		0.526	3	
10	Talking to patients about personal problems	Social Related Stressor (SRS)	0.645	3	0.701
11	Facing illness or death of the patients		0.488	3	
12	Verbal or physical abuse by other student(s)		0.495	4	
13	Verbal or physical abuse by teacher(s)	Intrapersonal and Interpersonal Related Stressor (IRS)	0.504	4	0.902
14	Verbal or physical abuse by personnel(s)		0.507	4	
15	Conflict with teacher(s)		0.45	4	
16	Unwillingness to study medicine	Drive and Desire Related Stressor (DRS)	0.613	5	0.705
17	Parental wish for you to study medicine		0.641	5	
18	Not enough feedback from teacher (s)		0.44	6	
19	Uncertainty of what is expected of me	Teaching and Learning Related Stressor (TLRS)	0.667	6	0.796
20	Lack of recognition for work done		0.696	6	
	MSSQ				0.884

Table 4: Level of anxiety

	STAI Y1 state anxiety		STAI Y2 trait anxiety	
	Women	Men	Women	Men
Mean	44.4	40.58	45.99	41.78
N	181	87	181	87
SD	11.87	10.1	10.67	9.44
% of students with high anxiety level	35.1		44.1	

Table 5: The main stressors ranked by mean degree of stress as perceived by the medical students (identified by the MSSQ)

Stressor	Mean Value
Tests/examinations	2.914
Falling behind in reading schedule	2.698
Large amount of content to be learnt	2.795
Lack of time to review what have been learnt	2.731
Heavy workload	2.396
Participation in class presentation	2.276
Need to do well (imposed by others)	2.049
Feeling of incompetence	2.299
Unable to answer questions from patients	2.321
Talking to patients about personal problems	1.675
Facing illness or death of the patients	2.239
Verbal or physical abuse by other student(s)	1.433
Verbal or physical abuse by teacher(s)	1.825
Verbal or physical abuse by personnel(s)	1.381
Conflict with teacher(s)	1.877
Unwillingness to study medicine	1.396
Parental wish for you to study medicine	1.011
Not enough feedback from teacher (s)	1.474
Uncertainty of what is expected of me	1.675
Lack of recognition for work done	1.791

Among studies variables, three variables predicted academic stress and accounted for 45.6 % of the variance ($F_{3,263}$=33.094, p=0.000). Those variables were: sex (female), STAI trait anxiety and neuroticism.

Discussions

Several studies have examined the relationship between personality type and stress. Personality traits may influence a person's perception of or reaction to stressful situations (Vollrath 2001). Medical students carry certain personality traits such as perfectionism or performance-based self-esteem, that make them vulnerable to mental distres (Enns 2001; Dahlin 2007). The students from our sample have showed high scores on neuroticism and conscientiousness.

Table 6 Correlations between academic stress and personality variables

STAI-Y2 trait anxiety	Spearman's rho	0.466**
	p	0
	N	267
Neuroticism	Spearman's rho	0.449**
	p	0
	N	267
Extraversion	Spearman's rho	-0.158**
	p	0.01
	N	267
Openness	Spearman's rho	-0.019
	p	0.758
	N	267
Agreeableness	Spearman's rho	-0.029
	p	0.637
	N	267
Conscientiousness	Spearman's rho	-0.127*
	p	0.037
	N	267

Tabel 7. Summary of stepwise multiple regression analysis of variables predicting academic stress

	β	p
predicting variable		
STAI trait anxiety	0.316	<0.001
sex	0.24	<0.001
neuroticism	0.171	0.008
excluded variables		
STAI state anxiety	-0.015	0.816
living condition	0.04	0.454
household economic situation	0.017	0.755
Extraversion	0.028	0.629
Openness	-0.033	0.541
Agreeableness	0.028	0.605
Conscientiousness	0.005	0.932
R²=0.456, p<.001		

Neuroticism is strongly associated with a propensity to experience negative emotions (Matthews, Deary, &Whiteman, 2009). In our study STAI trait anxiety and neuroticism were significantly and positively correlated with academic stress.

The differences between male and female students are similar with other researches, Coulston (2012) had found higher scores on neuroticism in females than in males, which is in accordance with a higher depression rate for women in the general population (Dahlin 2005).

Regarding academic stress, the top stressors were related with academic matters: test and examinations, large amount of contents to be learnt, lack of time to review what has been learnt, falling behind in reading schedule and heavy workload. The findings are similar with others studies, although the instruments used to measured academic stressors were different (Firth 1986; Gutrie 1998; Saipanish 2003; Yosoff 2010).

Conclusions

The total Cronbach's alpha value of the Romanian version of MSSQ was 0.884. The reliability coefficients of the stressor groups have ranged from 0.704 to 0.902. The top stressors as showed by MSSQ are exams, falling behind in learning schedule, large amount of content to be learnt, heavy workload and lack of time to review what have been learnt. Two months after the begining of the academic year, 35.1% of the students showed high state anxiety and 44.1% of the students showed high trait anxiety. Academic stress was predicted by trait anxiety, gender (female) and neuroticism

References

Aktekin M, Karaman T, Senol YY, Erdem S, Erengin H, Akaydin M. Anxiety, depression and stressful life events among medical students: a prospective study in Antalya, Turkey. Med Educ 2001;35(1):12-17.

Ang RP, Huan VS. Relationship between academic stress and suicidal ideation: testing for depression as a mediator using multiple regression. Child Psychiatry Hum Dev 2006;37:133–143.

Compton MT, Carrera J, Frank E. Stress and depressive symptoms/dysphoria among US medical students: results from a large, nationally representative survey. J Nerv Ment Dis 2008;196:891–897.

Costa PT, Mc Crae RR. Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) Manual. Psychological Assessment Resources, 1992, Odessa, FL.

Costa PT, Mc Crae RR. Neo Pi-R Manual tehnic și interpretativ -adaptat în România de Iliescu D, Minulescu M, Nedelcea C, Ispas D, Sinapsis, Cluj, 2010.

Coulston C, Vollmer-Conna U, Malhi G. Female medical students: who might make the cut? Psychiatry Res 2012;200(2-3):457-463.

Dahlin M, Joneborg N, Runeson B. Stress and depression among medical students: a cross sectional study. Med Educ 2005;39:594-604.

Dahlin M, Joneborg N, Runeson B. Performance-based self-esteem and burnout in a cross-sectional study of medical students. Med Teach 2007;29:43-48.

Diener E, Suh EM, Lucas RE, Smith HL. Subjective well-being: Three decades of progress. Psych Bull 1999;125:276–302.

Enns MW, Cox BJ, Sareen J, Freeman P. Adaptive and maladaptive perfectionism in medical students. Med Educ 2001;35:1034−1042.

Firth-Cozens J. Doctors, their well-being, and their stress. Br Med J 2003;326:670–671.

Firth J. Levels and sources of stress in medical students Br Med J 1986;292(6529):1177-80.

Guthrie E, Black D, Bagalkote H, Shaw C, Campbell M, Creed F. Psychological stress and burnout in medical students: a five-year prospective longitudinal study. J R Soc Med 1998;91(5):237-43.

Levey RE. Sources of stress for residents and recommendations for programs to assist them. Acad Med 2001;76:142–150.

Matthews G, Deary IJ, Whiteman MC. Personality traits. Cambridge: Cambridge University Press, 2009.

McManus IC, Keeling A, Paice E. Stress, burnout and doctors' attitudes to work are determined by personality and learning style: A 12-year longitudinal study of UK medical graduates. BMC Med Educ 2004;2:29–40.

Niemi PM, Vainiomaki PT. Medical students' academic distress, coping and achievement strategies during the pre-clinical years. Teach Learn Med 1999;11(3):125-134.

Saipanish R. Stress among medical students in a Thai medical school. Med Teach 2003;25(5):502-6.

Silver HK, Glicken AD. Medical student abuse. Incidence, severity, and significance. JAMA 1990;263(4): 527-532.

Stewart SM, Lam TH, Betson CL, Wong CM, Wong AM. A prospective analysis of stress and academic performance in the first two years of medical school. Med Ed 1999;33:243–250.

Tyssen R, Dolatowski FC, Rovik JO, Thorkildsen RF, Ekeberg O, Hem E, et al. Personality traits and types predict medical school stress: A six-year longitudinal and nationwide study. Med Educ 2007;41:781–787.

Vitaliano PP, Maiuro RD, Mitchell E, Russo J. Percieved stress in medical school: resistors, persistors, adaptors and maladaptors. Soc Sci Med 1989;28:1321–1329.

Vollrath M. Personality and stress. Scand J Psychol 2001;42:335–347.

Yusoff MSB, Rahim AFA. The Medical Student Stressor Questionnaire (MSSQ) Manual. Malaysia; KKMED Publications. Available online at http://www.medic.usm.my/dme/images/stories/staff/KKMED/2010/manual%20mssq.pdf

Yusoff MSB, Rahim AFA, Yaacob M. The development and validity of the Medical Student Stressor Questionnaire (MSSQ), ASEAN J Psychiatr, 11(1). Available online at http://www.aseanjournalofpsychiatry.org/oe11105.htm.

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