

Sources and Severity of Perceived Stress Among Iranian Medical Students

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Background: Studying medicine is perceived to be stressful, and a high level of stress may have a negative effect on cognitive functioning and mental health of the students.

Objectives: In this study, we assessed perceived stress and its severity, sources and determinants.

Patients and Methods: In this cross-sectional study, we assessed the perceived stress and its severity, sources and demographic variables in 341 (136 males, 205 females) randomly selected medical students of Tehran university of medical sciences, Iran, in October 2013. A self-administered valid and reliable questionnaire with a possible range of scores from 0 to 56 was used to collect the data. Stress sources were determined using logistic regression analysis.

Results: The overall perceived stress mean was 32.02 (SD = 5.08). Eighty-three percent of the medical students perceived stress. Students in clinical phase perceived more stress than basic sciences ones [OR 2.25, 95% CI 1.809 - 4.032]. Logistic regression analysis showed demographic (including gender and residential status), psychosocial and academic factors and the phase of study as sources of stress.

Conclusions: The results of this study show that most of the medical students declared perceived stress. So, a change in medical education environment and empowering students to effectively cope with the perceived stress sources and their families to support their children is needed.

Keywords: Students, Medical; Stress, Psychological

1. Background

Studying in university is one of the stressful stages of life, because the person experiences stressful events such as education, moving away from home, separating from family members, and changes in friendship relations. On the other hand, studying medicine, by itself, seems to be stressful (1-4). Some studies have shown relatively high levels of distress, such as symptoms of depression and suicidal ideation in medical undergraduates (5-7). Also, medical students' personal distress may have negative effects on their academic performance (8, 9) and health (10, 11).

Stress is caused by an existing stress-causing factor or "stressor". Students' stressors may include the pressure of expectation to succeed, an uncertain future, difficulties of integrating into the system, social, emotional and physical and family problems (12, 13), practical examinations in a medical college (14) which could be classified into three main areas including academic pressures, social issues and financial problems (15, 16). Most studies have observed the issue in either undergraduate (17) or postgraduate (18) medical students; however, there are few studies comparing the levels of stress among students from different levels (3, 19).

Studies performed in developing countries such as Pakistan, India, Thailand and Malaysia have demonstrated stress among medical students and also the role of academics as a source of stress (20, 21). Studies have found

that academic constraints and factors such as age, gender, ethnicity and marital status may also affect students' stress and academic performance (22, 23).

2. Objectives

Medical educators need to be aware of the prevalence, causes, and levels of stress among students, which affect not only their health but also their academic achievements at different points of time of their study period. Therefore, the objective of the present study was to assess perceived stress and its severity, sources and the determinants.

3. Patients and Methods

The present study was approved and performed in Tehran University of Medical Sciences (TUMS), Iran, in October 2013. This research was performed among medical doctorate students. Participants were the students enrolled in various courses of basic and clinical sciences. We excluded students who had not enrolled the semester or were guest to TUMS. We selected participants from the student list using systematic randomization. The randomization was proportional to size regarding the level of students (basic sciences and clinical).

Using Cohen tables, the required sample with an allowable error of 10% and 95% confidence limits (24) was 352.

Eleven students refused to participate in the study; so, the final sample size was 341 (response rate: 96.8%).

In this cross-sectional study, we used an anonymous self-administered questionnaire. The students were informed of the purpose and objectives of the study. The students were assured about anonymity and confidentiality of the responses. The questionnaire comprised of 3 parts: demographic data, Perceived Stress Scale (PSS-14) and a 33-item list of potential stressors (25).

Demographic information included age, gender, residential status and family members' education and job. The last item was used to estimate family's socio-economic Status (SES) (26). The perceived stress scale-14 comprised of 14 questions with focus on participants' experience during one month prior to the survey. Responses were scored from 0 to 4 for items never, almost never, sometimes, fairly often and very often respectively; so, the questionnaire has a possible range of scores from 0 to 56. The upper two and lower two quartiles were combined (28 being the operational cut-off value for the upper bound) and were labeled as stressed and not stressed, respectively. This cut-off value was selected in accordance to a similar study from Egypt (27). The Cronbach coefficient for PSS-14 was 0.75. Test-retest reliability during several days was 0.81. For the third part of the questionnaire, potential stressors were adapted from a similar study from Nepal by Sreeramareddy et al. (28) and Shah (25). Thirty-three stressors were listed and grouped as academ-

ic, psychosocial and health-related stressors. For each potential stressor the frequency of occurrence was classified as never, rarely, sometimes, often and always and scored as 1 to 5, respectively. The severity of each stressor was rated using a Likert scale (1 to 10) ranging from not severe to very severe. Its Cronbach coefficient was 0.81. In exploratory factor analysis, three factors explained 51.22% of the variance.

The data were analyzed using SPSS software (version 17.0. Chicago: SPSS Inc.). The mean scores of perceived stress and the number and percentage of stressed cases were calculated according to demographic variables. Descriptive statistics were calculated for severity of stressors. Logistic regression analyses were carried out to assess determinants of stressed cases. Considering the ethical issues, we kept participants' data confidential and obtained their informed consent. Students had the right not to participate at all or to leave the study at any time. We obtained ethical approval (No. 15108, 2012) from TUMS.

4. Results

In this study, 341 students voluntarily completed the questionnaire. The mean age was 22.04 (SD = 1.99) with a range of 18 - 28 years. The overall PSS mean score of the participants was 32.02 (SD = 5.08). Two hundred and eighty four cases (83%) had perceived stress (PSS-14 score more than 28). Table 1 shows participants' and stressed cases' demographic characteristics.

Table 1. Demographic Characteristics of the Participants and Stressed Cases ^a

Variable	No. of Participants	No. of Stressed Cases
Gender		
Male	136 (40)	104 (37)
Female	205 (60)	180 (63)
Age, y		
< 20	25 (7)	20 (7)
≥ 20	316 (93)	264 (93)
Residential status		
Campus hostel	163 (48)	155 (55)
Outside campus	178 (52)	129 (45)
Father's education		
≤ Higher secondary	123 (36)	115 (40)
Graduate/Post graduate	218 (64)	169 (60)
Mother's education		
≤ Higher secondary	186 (55)	177 (62)
Graduate/Post graduate	155 (45)	107 (38)
Father's job		
Self-employed	165 (48)	132 (46)
Officer	125 (37)	108 (38)
Worker	51 (15)	44 (16)
Mother's job		
Housekeeper	160 (47)	116 (41)
Officer	130 (38)	120 (42)
worker	51 (15)	48 (17)
Phase of study		
Basic sciences	183 (54)	162 (57)
Clinical sciences	158 (46)	122 (43)

^a Values are presented as No. (%).

Sources and self-reported severity of stressors are shown in Table 2. The most frequently occurring sources of stress reported by students as often/always were frequency of examinations (68%), performance in examinations (64%), academic curriculum (63%), lack of entertainment in the institution (65%), loneliness (59%), non-availability of adequate learning materials (55%), lack of special guidance from faculty (53%), becoming a doctor (50%), and living conditions in the hostel (51%).

Table 3 shows the results of logistic regression analysis for demographic factors and stress sources in stressed

cases. This table shows the adjusted odds ratio of stress associated with each variable. Being categorized as a stressed case was associated with being a female [OR 3.219, 95% CI 1.35 - 7.781], living in campus hostel [OR 2.854, 95% CI 1.571 - 2.277], phase of study [OR 2.25, 95% CI 1.809 - 4.032], often/always occurrence of academic stressors [OR 5.07, 95% CI 1.52 - 6.68] and often/always occurrence of psychosocial stressors [OR 4.484, 95% CI 3.240 - 8.977]. This analysis shows demographic (including gender and residential status), psychosocial and academic factors and phase of study as sources of stress.

Table 2. Sources of Stress and Its Perceived Severity

Sources of Stress	Frequency of Occurrence Severity		
	Never/Almost Never	Sometimes	Often/Very Often
Academic			
Frequency of examinations	34 (10)	76 (22)	231 (68)
Performance in examinations	54 (16)	70 (20)	217 (64)
Academic curriculum	48 (14)	78 (23)	215 (63)
Dissatisfaction with class lectures	82 (24)	110 (32)	149 (44)
Non-availability of adequate learning materials	55 (16)	98 (29)	188 (55)
Becoming a doctor	80 (23)	92 (27)	169 (50)
Lack of time for recreation	77 (23)	109 (32)	155 (45)
Competition with peers	81 (24)	94 (27)	166 (49)
Performance in practice	78 (23)	118 (35)	145 (42)
Lack of special guidance from faculty	65 (19)	95 (28)	181 (53)
Psychosocial			
High parental expectations	109 (32)	108 (32)	124 (36)
Loneliness	39 (12)	100 (29)	202 (59)
Family problems	250 (73)	50 (15)	41 (12)
Accommodation away from home	92 (27)	117 (34)	132 (39)
Political situation in the country	176 (52)	61 (18)	104 (30)
Relations with the opposite sex	119 (35)	96 (28)	126 (37)
Difficulty in reading text books	74 (22)	103 (30)	164 (48)
Lack of entertainment in the institution	45 (13)	74 (22)	222 (65)
Difficulty in the journey back home	59 (17)	120 (35)	162 (48)
Quality of food in mess	71 (21)	100 (29)	170 (50)
Financial strain	154 (45)	101 (30)	86 (25)
Inability to socialize with peers	245 (72)	58 (17)	38 (11)
Living conditions in the hostel	96 (28)	72 (21)	173 (51)
Member of fraternity or sorority	248 (73)	23 (7)	70 (20)
Lack of personal interest in medicine	201 (59)	37 (11)	103 (30)
Adjustment with roommate/s	199 (58)	52 (16)	90 (26)
Health			
Sleeping difficulties	233 (68)	68 (20)	40 (12)
Class attendance	231 (68)	74 (22)	36 (10)
Nutrition	192 (56)	89 (26)	60 (18)
Exercise	242 (71)	64 (19)	35 (10)
Quality of food in mess	313 (92)	17 (5)	11 (3)
Physical disability	316 (92)	16 (5)	9 (3)
Alcohol/drug abuse/smoking	233 (68)	68 (20)	40 (12)

Table 3. Determinants of Stressed Cases by Logistic Regression

Variable	Adjusted OR	(95% CI)
Gender		
Male	1	1
Female	3.219	1.35 - 7.781
Age, y		
≥ 20	1	1
< 20	0.484	0.240 - 0.977
Residential status		
Outside campus	1	1
campus hostel	2.854	1.571 - 2.277
Father's education		
Graduate/Post graduate	1	1
≤ Higher secondary	0.65	0.809 - 2.932
Mother's education		
Graduate/ Post graduate	1	1
≤ Higher secondary	2.35	0.645 - 2.988
Father's job		
Self-employed	1	
Officer	0.362	0.045 - 1.23
Worker	0.741	0.621-1.845
Mother's job		
Housekeeper	1	
Officer	0.112	0.777 - 1.591
worker	0.234	0.562 - 1.741
Phase of study		
Basic sciences	1	1
Clinical sciences	2.25	1.809 - 4.032
Occurrence of Academic Stressors		
Less than often	1	1
Often/Always	5.07	1.52 - 6.68
Occurrence of Psychosocial Stressors		
Less than often	1	1
Often/Always	4.484	3.240 - 8.977
Occurrence of Health Stressors		
Less than often	1	1
Often/Always	0.856	0.455 - 1.61

5. Discussion

The present study was performed to investigate the perceived stress in medical students and identify its sources. The results of this study showed that 83% of medical students in TUMS reported perceived stress, of those 54% were in basic sciences and 46% were in clinical phase. The perceived stress in Iranian students is similar to that of students from some other parts of the world (21).

Some studies show that medical program is stressful during the first year of the study but less so in subsequent years (29). In our study there was no significant difference in the prevalence of perceived stress according to the phase of study, though it was higher in basic sciences' students than clinical ones (57% against 43%). This can be explained by a gradual adaptation of students to the new living environment and the curriculum.

Our results showed that gender is an important factor in perceived stress in medical students and the female students' perceived stress 3.219 times more than male ones. This result is inconsistent with some studies (25). Literature suggests different causes for this difference: a poor learning environment in the female campus and lesser educational facilities and recreation opportunities (25, 27, 30). We think that the difference found in our study would be due to the conflict between women's education and employment as a human resource, and their traditional role, housekeeping tasks in Iran (31).

Also, studies have shown that women tend to perceive more stressful life than men (32). However, this issue could not appropriately be explained by our study and requires further investigation.

Our study shows that students who live in hostel experience stress 2.854 times more than those who don't live in hostel. May be the new experience of living in a hostel and the need to flexible adaptation to the situation are the reasons for perceiving stress.

We found "phase of study" as one of the causes of perceiving stress. Students in clinical phase perceived stress 2.25 times more than student in the basic sciences' phase. This result is in compliance with the findings of some other studies (33, 34).

In addition to demographic factors, educational and psycho-social factors were also important stressors reported by the medical students. Among educational factors, examination, performance in examination and academic curriculum were the most important sources of perceived stress. These findings are in compliance with other studies (21-23).

Lack of entertainment in the institution and loneliness were the most prevalent psycho-social related factors of perceived stress. It could be assumed that lack of social support as one of the ways to cope with stress (35) was the reason.

Despite performing the study in TUMS with high number of basic sciences and clinical medical students, we had some limitations. The scope of the study was restricted to this university. Therefore, it is recommended to perform the study in all universities and include residents as participants.

Considering the high prevalence of perceived stress in Iranian medical students and critical role of medical graduates in society's health, it is recommended to provide or promote the academic, psychological and health environment to reduce stress in students.

Authors' Contributions

Somaieh Borjalilu contributed in the study design, collected the data and helped in data analysis and drafting the manuscript. Aeen Mohammadi designed the research, analyzed and interpreted the data and made critical revisions on the final draft of the manuscript. Rita Mojtahedzadeh supervised the research, helped in inter-

preting the data and prepared the first draft of the manuscript. All the authors approved the final manuscript.

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