Predictors of Perceived Stress among Medical and Nonmedical College Students, Minia, Egypt

Abstract

Background: Nowadays, stress has been tagged a global phenomenon. Many undergraduate students undergo considerable stress, and a variety of sources of stress have been identified among university students. The aim of this study is to identify the level of perceived stress and its predictors among medical and nonmedical Minia University students. **Methods:** This was a cross-sectional study comparing between medical and nonmedical students in Minia University, conducted during the period from March to April 2017. The sample consisted of 314 medical and 291 nonmedical students chosen through cluster random sampling as a section was chosen randomly from each academic year and collectively form the final sample. Data were collected through interview by a questionnaire inquiring about sociodemographic data, common stressors as academic, financial, family, and transportation stressors and Cohen Perceived Stress Scale 10. **Results:** The prevalence of perceived stress was slightly higher (88.9%) among medical students than among nonmedical students (83.5%). Severe stress was found among (18.8%) of medical students compared to (12.4%) among nonmedical students ($P < 0.05$). The significant predictors of perceived stress were academic stressors, no exercise and being female among medical students, and were academic and financial stressors among nonmedical students. **Conclusions:** Medical students perceived more stress than nonmedical students. The academic stressors were significant predictors among all students; hence, there is a need for the establishment of students counseling unit, to facilitate coping with the stress of study and examination.

Keywords: *College students, medical, perceived stress, stressors*

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Introduction

Perceived stress is not about measuring the frequency of stressful events rather it is about how an individual feels about the general stressfulness of his life and the ability to handle such stress.[1]

College students are exposed to a considerable numbers of stressors; these stressors include internal and external pressures exerted by the environment.[2] In addition, university students are a special group of people that are enduring a critical transitory period in which they are going from adolescence to adulthood and can be one of the most stressful times in a person's life.[3-6]

Medical education is considered a highly stressful variable.[7] It is not only a part of the university; however, it results from everyday responsibilities at home, school, and work.[8] Studies showed that medical students were at great exposure to psychological stress compared to their age-matched peers of other faculties.[9-11]

It was found in a study conducted in the USA that undergraduate college students, not only medical students, were suffered from stress.[12]

Another study determined that the proportion of stress in medical and engineering students from professional colleges was 25.1% and 19.7%, respectively.[13]

This study aimed to identify the level of perceived stress and its predictors among medical and nonmedical students, Minia University.

Methods

A cross-sectional study conducted during the period from March to April 2017.

A sample was selected from students of Faculty of Medicine and another faculty representing nonmedical faculties, Minia University. This study included students who were available at their classrooms

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during data collection time, agreed to participate in the study, not taking medications that may lead to mental symptoms such as anticonvulsants, antidepressants, antipsychotics, sedative, stimulants, antihistaminic, and corticosteroids[14] and not suffering from chronic diseases as diabetes, hypertension, and asthma which commonly associated with high depression rate.[15]

The sample size was calculated using Epi Info program version 2000. According to students' affairs administration, the total number of registered medical students in 2017 was 3244 students of both genders in the 6 years. A previous study reported that 20.1% of medical students suffer high level of stress.[16] With the worst acceptable level 25%, the sample was estimated to be at least 227 students at 99% confidence level. To overcome the problem of incompleteness of the questionnaires, the sample size was increased. An equal number of nonmedical students was included in this study.

The faculty of specific education was randomly chosen to represent nonmedical faculties. Students were selected through stratified cluster sampling technique. First, students were stratified into the different academic years (first to sixth in medicine and first to fourth in Faculty of Specific Education). From each year, a section (cluster) was randomly chosen. All students in the chosen clusters were included in this study. These sections collectively form the final sample. A total of 329 and 343 students were registered in chosen clusters in Medicine and Specific Education faculties, respectively. The response rates were 96% (314 of 329) in the Faculty of Medicine and 85% (291 of 343) in the Faculty of Specific Education. None participation was due to lack of interest in the study and absence during the study. All incomplete questionnaires were excluded from the study.

Data were collected through an interview where a predesigned Arabic questionnaire was distributed to be filled by the students. It was formed of two parts with 63 questions.

First part

It consists of two sections: Section 1 covering the sociodemographic data. It includes age, gender, residence, parent education and occupation, and regular practicing of exercise and academic performance in the previous year and Section 2 covering the common stressors among students including academic stressors: they were related to content and teachers' stress, results stress, tests stress, time management stress, and self-inflected stress:
- Financial problems including fees of books and transportation
- Family-related stressors as family troubles, availability of a suitable environment for studying, family satisfaction with his study, and family acceptance of home visits by his friends

- Transportation problems as difficult transportation and distance between home and the university.

To identify potential stressors, the cutoff value for each stressor was determined at 50% or higher. So that, if a student has 50% or more items of any stressor, he was considered to have this stressor.[13]

Second part

It includs the Arabic translated version of Cohen Perceived Stress Scale 10 (PSS) which is the tool used in this study for measuring the level of perceived stress.[17]

The Arabic version of PSS 10 was translated[18] with cronbach's alpha value of (0.836).

The scale consists of ten questions; scoring by 5-point Likert scale (0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Fairly often, and 4 = Always) is done. The scores of the four positively stated items 4, 5, 7, and 8 were reversed (e.g., 0 = 4, 1 = 3, 2 = 2, 3 = 1 and 4 = 0) and then add up the scores for each item to get a total. Individual scores on the PSS can range from 0 to 40 with higher scores indicating higher perceived stress (linear relation), stress was stratified as follows:
- Scores range from 0 to 13 indicated low-stress level
- Scores range from 14 to 26 indicated moderate stress level
- Scores range from 27 to 40 indicated high-stress level.

Low-stress level considered as having no stress, while both moderate- and high-stress levels were merged as having stress.[19] The questionnaire took about 20 min to be filled.

A pilot study was carried out on 25 3rd year students from both faculties. Some modifications were done in the questionnaire, so these 25 sheets were excluded from the study.

Data were analyzed by Statistical Package for Social Sciences version 20 (SPSS Inc., Chicago, IL, USA). Data were summarized using descriptive statistics in the form of numbers and percentages. Chi-square test was used for the analysis of the associations and for comparison between groups for qualitative data. *Z*-test was used for the analysis of the association between two groups for qualitative data.

Significant factors predicting severe stress level on univariate analysis were entered into multivariate logistic regression analysis to find out the independent predictors of stress. Odds ratio and 95% confidence interval (CI) were calculated. *P* < 0.05 was considered statistically significant.

Ethical considerations

An approval of Minia University administration was obtained. The proposal was approved by the Institution Research Ethical Committee. All participants gave verbal consent to participate in the study.

Results

Table 1 revealed that the number of students included in the study was 605 students; (51.9%) of them were from Faculty of Medicine and (48.1%) from Faculty of Specific Education. Female students constituted (58.3%) of participant and men constituted (41.7%). About (53%) of students were from rural residence and (47.4%) were from urban residence.

The largest percentage of students had highly educated fathers (51.4%) and mothers (36.7%). The majority of students` fathers had professional jobs (50.9%) while (54.9%) of their mothers were nonworking. Regarding students' perception of their family income per month (78.7%) of students perceived it as being satisfactory and only (21.3%) perceived it to be not satisfactory.

Table 2 showed that the percentage of stress (moderate and severe) among medical students was (88.9%) compared to (83.5%) among nonmedical students. Severe stress level was significantly reported more by medical students (18.8%) than nonmedical students (12.4%), on other side, nonmedical students with mild stress level were (16.5%) compared to medical students (11.1%).

This table also revealed that there was a significant association between gender and stress degree among the students. Nearly (82.1%) of students who had severe perceived stress level were females compared to (17.9%) men, while (61.5%) of students who had mild stress degree were men compared to (38.5%) females.

Table 3 showed that having >50% of academic stressors among students with moderate-to-severe perceived stress level was significantly higher in medical students (84.9%) compared to (71.2%) in nonmedical students, while having >50% of family, financial, and transportation stressors were significantly higher in nonmedical students (14.4%), (82.3%), and (58.8%), respectively.

Table 4 found that the significant predictors of moderate and severe level of perceived stress among medical students were in order having >50% of the academic-related stressors (odds radio [OR] = 3.691, 95% CI 1.674–8.137; $P = 0.001$), not practicing exercise (OR = 2.630, 95% CI 1.183–5.846; $P = 0.018$) and female gender (OR = 2.555, 95% CI 1.184–5.510; $P = 0.017$). The significant independent predictors of moderate and high level of perceived stress among nonmedical students were in order having >50% of the academic-related stressors (OR = 2.911, 95% CI 2.150–8.647; $P = 0.003$), having >50% of financial stressors (OR = 2.469, 95% CI 1.130–5.394; $P = 0.023$).

Discussion

Stress level was high among Minia University students especially the medical students. The percentage of

Table 1: Sociodemographic characteristics of the studied sample of Minia University students in 2017

Variable	Categories	*n* (%)
Faculty	Medical	314 (51.9)
	Nonmedical	291 (48.1)
Gender	Males	252 (41.7)
	Females	353 (58.3)
Residence:	Urban	287 (47.4)
	Rural	318 (52.6)
Father education	Illiterate	44 (7.3)
	Read/write	60 (9.9)
	Below university	190 (31.4)
	University and above	311 (51.4)
Father occupation	Nonworking	44 (7.3)
	Manual	95 (157)
	Clerical	158 (26.1)
	Professional	308 (50.9)
Mother education	Illiterate	116 (19.2)
	Read/write	71 (11.7)
	Below university	196 (32.4)
	University and above	222 (36.7)
Mother occupation	Nonworking	332 (54.9)
	Manual	13 (2.1)
	Clerical	67 (11.1)
	Professional	193 (31.9)
Perceived family income/month	Satisfactory	476 (78.7)
	Not satisfactory	129 (21.3)
Practice of exercise	Yes	178 (29.4)
	No	427 (70.6)
Total		605 (100)

Table 2: The level of perceived stress among medical and nonmedical students and both gender

	Stress degree			Total	Significance
	Mild	Moderate	Severe		
Faculty, *n* (%)					
Medical	35 (11.1)	220 (70.1)	59 (18.8)	314 (100)	χ^2=7.14 P=0.02
Nonmedical	48 (16.5)	207 (71.1)	36 (12.4)	291 (100)	
Gender					
Male	51 (61.5)	184 (43.1)	17 (17.9)	252 (49.8)	χ^2=21.7 P=0.0001
Female	32 (38.5)	243 (56.9)	78 (82.1)	353 (50.2)	
Total	83 (13.7)	427 (70.6)	95 (15.7)	605 (100)	

stress (moderate and high stress) among medical students in the present study was 88.9% that was lower than a study conducted in Pakistan where stress percentage among medical students was 92.5%,[20] but higher than other studies conducted among medical students, as in a study at Saudi Arabia which reported stress among 71.9% of medical students[21] while in Egypt in a study conducted at Fayoum University, stress among medical students was

Table 3: Association between moderate/severe perceived stress level and stressors among medical and nonmedical Minia University students

Stressor (>50%)*	Moderate/severe		Total, n (%)	Z	P
	Medical (n=279), n (%)	Nonmedical (n=243), n (%)			
Academic	237 (84.9)	173 (71.2)	410 (78.5)	3.82	0.0001
Family	8 (2.9)	35 (14.4)	43 (8.2)	4.79	0.0001
Financial	136 (48.7)	200 (82.3)	336 (64.4)	10.01	0.0001
Transportation	116 (41.6)	143 (58.8)	259 (49.6)	3.94	0.0001

*Students reported >50% of items of each stressor

Table 4: Logistic regression analysis of independent predictors of moderate/severe perceived stress among medical and nonmedical students

	OR	95% CI		P
		Lower	Upper	
Predictors among medical students				
Academic stressors >50%	3.691	1.674	8.137	0.001
Not practicing exercise	2.630	1.183	5.846	0.018
Being a female	2.555	1.184	5.510	0.017
Transportation stressors >50%	1.022	0.448	2.330	0.958
Family stressors >50%	0.134	0.307	1.258	0.998
Financial stressors >50%	0.985	0.439	2.208	0.970
Predictors among nonmedical students				
Academic stressors >50%	2.911	2.150	8.647	0.003
Not practicing exercise	2.469	1.130	5.394	0.023
Being a female	1.543	0.785	3.033	0.209
Transportation stressors >50%	1.086	0.407	2.897	0.869
Family stressors >50%	0.839	0.424	1.661	0.615
Financial stressors >50%	0.631	0.307	1.298	0.211

OR=Odds ratio, CI=Confidence interval

about 62.3%,[22] in another study conducted in Ain shams university 54% of medical students reported having stress.[23]

The current study also found that severe stress level among medical students was 18.8% which agreed with a study conducted in Egypt at Mansoura University where severe stress accounted for 20.1% among medical students[15] and also agreed with a study conducted in Saudi Arabia where 19.6% of medical students had severe stress.[24] However, the current finding was less than a study conducted in Pakistan among medical students54.6%,[25] other studies were done among Saudi medical students also showed that the prevalence of severe stress was 33.8%[26] and25%.[27] This variation may be due to cultural differences, differences in sociodemographic background of participants, differences in the health-care system, and the tools used for measurement in these studies.

The current finding showed that the percentage of stress among nonmedical students in this study was 83.5% and students with severe stress level accounted for 12.4%

of students which was lower than the percentage among medical students. This was in agreement with studies conducted[10-12,25] stating that medical students were at great exposure to psychological stress compared to their age-matched peers.

Some studies were against these findings as in a study conducted[15] in Egypt comparing medical and law students and found that severe stress level was more among law students. This may be explained by the few opportunities for jobs after graduation for the huge numbers of admitted law students.

The results of this study revealed that female students had significantly higher stress level than male students. This finding was in agreement with other studies.[26,28-30] However, some studies found no gender differences in stress perception,[31,32] while some studies found that male students reported higher stress levels than female students.[33] These differences may be due to cultural and environmental difference.

The current study showed that there was a significant association between practicing exercise and the perceived stress among the studied group of students. This finding was in agreement with a study conducted[34] in Georgia which found the protective effect of exercise on stress coping among college students. It was reported that college students participating in physical activity are likely to have less stress symptoms and more ability to improve their well-being.[35]

This study found that academic stressors were the most common stress sources among medical students with moderate and severe stress (84.9%) while (48.1%) had financial stressors, (41.1%) had transportation stressors, and (2.5%) had family stressors. This was in agreement with studies conducted in Egypt at Ain-Shams, Fayoum and Mansoura Universities which found that academic-related problems were the most common source of stress among medical students.[16,23,36]

In the current study, academic source of stress was found among (71.2%) of nonmedical students with moderate-to-severe stress which although high, t significantly lower than among medical students (84.9%). On the other hand, family, financial, and transportation stressors were significantly higher among nonmedical students than among medical students and found among (14.4%), (82.3%), and (58.8%) of nonmedical students, respectively. This was in accordance with a study about sources of stress among Fayoum University students in Egypt which found that academic stressors were significantly more in medical than nonmedical students, while family, financial, and transportation stressors were higher among nonmedical students.[36]

In this study, logistic regression analysis of the independent predictors of stress revealed the main predictors for

moderate and sever stress level among both medical and nonmedical students were having >50% of academic stressors. This was in accordance with a study stated that academic factor was one of the significant predictors of having stress among Indian students.[17] Being female was the second predictor among medical students and this was in agreement with the logistic regression analysis done where stressed cases were predicted by being a female.

Limitations

This was a cross-sectional study allowing studying associations but not causality. This depended on information reported by students. Therefore, there was a potential for reporting bias. In addition, the perception of stress levels can vary among individuals and throughout times of the year. Choosing of Faculty of Specific Education is subject to selection bias because of the diversity of nonmedical faculties which might experience different level of stress; however, it was chosen randomly from all nonmedical faculties.

Conclusions

Medical students perceived more stress than nonmedical students. The academic stressors were significant predictors among all students so there is a need to orientation programs in the form of workshops for 1st year students, especially medical students, about stress and stress coping strategies. Establishment of counseling unit in the college for students to help them to meet their personal needs and cope with the stress of study and examination. Try to decrease curriculum with proper time management.

Conflicts of interest

There are no conflicts of interest.

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