Prevalence and predictors of perceived stress: a study among medical students of Ebonyi State University Abakaliki, Nigeria

ABSTRACT

Aims: To determine the prevalence and predictors of perceived stress among medical students of Ebonyi State University Abakaliki, Nigeria.

Study design: This was a descriptive cross-sectional study.
Place and Duration of Study: Ebonyi State University Abakaliki, Nigeria between February and March 2018.
Methodology: All medical students of Ebonyi State University Abakaliki who have spent at least one full academic session in the university were included in the study. Information was obtained using a validated questionnaire which was self-administered. The Cohen Perceived Stress Scale, (PSS-10) was used to determine the prevalence of stress. Chi square test of statistical significance and multivariate analysis using binary logistic regression were used in the analysis and the level of statistical significance was determined by a p value of <0.05.

Results: A total of 385 medical students participated in the study representing a response rate of 83.7%. The mean age of respondents was 23.2±3.4 years and majority, 64.2% were males. The mean perceived stress scale score was 19.8±5.9. The prevalence of high stress among the students was 51.9%. The fifth level class had the highest proportion of students who were stressed, (58.2%). Predictors of perceived high stress among the students included being a male student, (AOR= 0.6, 95% CI: 0.4- 0.9), being satisfied with medical training, (AOR= 0.6, 95% CI: 0.3- 0.8) and willingness to study Medicine again, (AOR= 0.5, 95% CI: 0.3- 0.8).

Conclusion: The prevalence of high stress among the students was high. There is the need to appropriately manage stress in the medical school especially among the female students. Also, ensuring the satisfaction of medical students with their training though subjective will be of immense benefit.

Keywords: Prevalence, predictors, perceived stress, medical students, Abakaliki, Nigeria.

1. INTRODUCTION

The World Health Organization is of the opinion that mental diseases including stress disorders will be the second leading cause of disabilities by the year 2020. [1] Stress is said to occur when pressure exceeds an individual's perceived ability to cope with daily demands at any point in time. [2] This means there is a threshold for stress for every individual beyond

which the person concerned may not be able to cope. Thus stress could be classified as being good or bad. Bad stress is referred to as distress and in such situations, the person is demotivated. Good stress is also called eustress and it is a form of stress in which the person involved perceives the stressor as positive. Perhaps, it is based on this observation, that a study in Nigeria, established a link between stress management skills and good academic performance. [3]

Consequently, a suggestion was made on the need to ensure that the well-being of medical students is promoted and sustained during the period of training. [4] This is because in the course of training students in the health professions, exposure to stress is almost inevitable. [5] Furthermore, there is evidence that medical students have higher stress scores than students in the other health professions. [6] Their stress levels are also higher when compared with students in other disciplines and the general population. [7,8] It has been found that the high level of stress among medical students is linked more to their academic activities. [9,10,11]

The impact of academic stress is very high as it affects the students' psychological well-being resulting in poor academic performance, [12] and eventually when they become doctors it impedes their ability to provide good quality health care. [13] Also, there is a relationship between perceived stress and increased levels of depression, [14,15] drug abuse, anxiety and even suicide.[16] All these put together may have accounted for the observation that there is a rise in cases of mental illnesses in the universities.[17] There is evidence that increased levels of stress increases the likelihood of onset of type 2 diabetes, heart and circulatory diseases. [18] Regrettably, even though medical students apparently have better access to health care, they are less likely to recognize symptoms of depression or receive the needed treatment if need be when compared with the general population.[19] The result is that they may adopt harmful coping measures like excessive alcohol consumption instead of seeking appropriate treatment. This study was designed to determine the prevalence and predictors of perceived stress among medical students of Ebonyi State University Abakaliki, Nigeria.

2. MATERIAL AND METHODS

2.1 Description of study area

Ebonyi State University, Abakaliki, Nigeria was founded in 1999. The medial school of the university like others in Nigeria has 6 classes regarded as levels. The second and third year study periods belong to the pre-clinical school while 400 to 600 levels are regarded as the clinical period of training. The university admits an average of one hundred students each year to study Medicine.

2.2 Study design

This was a descriptive cross sectional study.

2.3 Study population

The study population were medical students of Ebonyi State University Abakaliki, Nigeria. For inclusion in the study, the student must have completed one full academic session in the university. All students who refused to give consent to participate in the study and those not available during the period of data collection.

2.4 Sample size determination

This was a total population study of all medical students in Ebonyi State University from the second to final year. A total of three hundred and eighty five students participated in the study representing a response rate of 83.7%.

2.5 Study instrument

The study instrument for the assessment of perceived stress among the students was a validated questionnaire, the Cohen Perceived Stress Scale (Cohen PSS-10). It is one of the widely used psychological tool for measuring perceived stress. The questionnaire was self-administered. Participants were required to respond to each of the ten variables in the questionnaire. Each variable is a five point Likert scale ranging from 0 (never) to 4 (very often) and included questions on how they have felt or thought in certain ways within the past one month. Scores for each respondent ranged from 0 to 40 with higher scores being indicative of higher stress. Any respondent that scored ≥20 cumulatively was considered as having a high level of perceived stress.

2.6 Data management

Data entry and analysis were done using IBM Statistical Package for Social Sciences (SPSS) version 22. Frequency tables and cross-tabulations were generated. Chi square test of statistical significance and multivariate analysis using binary logistic regression were used in the analysis and the level of statistical significance was determined by a p value of < 0.05.

Multivariate analysis using binary logistic regression was used to determine the predictors of perceived stress among the students. Variables that had a p value of less than 0.2 on bivariate analysis (gender, educational attainment of father,

willingness to study Medicine again, satisfaction with medical training and academic workload being much) were entered into the logistic regression model to determine the predictors of perceived stress among the students, The result of the logistic regression analysis were reported using adjusted odds ratio and 95% confidential interval and the level of statistical significance was determined by a p value of <0.05.

In determining the predictors of perceived stress among the students, age of respondents was categorized into two, those <24 years and those ≥24 years. The basis for this was the mean age of the respondents which was 23.2±3.4 years.

3. RESULTS

Table 1: Socio-demographic characteristics of respondents

Variable	Frequency (n=385)	Percent (%)
Age of respondents		
Mean ±(SD)	23.2±3.4	
Age of respondents in groups		
<20 years	49	12.5
20-24 years	222	57.7
≥25 years	114	29.6
Gender		
Male	247	64.2
Female	138	35.8
Academic level		
200 level	86	22.3
300 level	79	20.5
400 level	79	20.5
500 level	79	20.5
600 level	62	16.1
Marital status		
Single	369	95.8
Married	16	4.2
Ethnic group of respondent		
Igbo	371	96.4
Yoruba	4	1.0
Minority groups	10	2.6
Religion		
Christianity	378	98.2
Islam	4	1.0
Traditional religion	3	0.8
Educational attainment of Father		
No formal education	25	6.5
Primary education	39	10.1
Secondary education	55	14.3
Tertiary education	266	69.1

Educational attainment of Mother		
No formal education	30	7.8
Primary education	48	12.5
Secondary education	54	14.0
Tertiary education	253	65.7

Table 1 shows the socio-demographic characteristics of the respondents. The mean age of the respondents was 23.2±3.4 years. Majority of the respondents, (57.7%) were in the age group 20-24 years. Majority, (64.2%) were males. Also, majority of the fathers of the respondents, (69.1%) and mothers, (65.7%) have attained tertiary education.

Table 2: Mean perceived stress scale by level and gender

Variable	Mean PSS score (n=385)	Test statistic	p value
Perceived stress scale score			
All respondents	19.8±5.9		
Perceived Stress Scale			
200 level	19.0±6.1	0.577**	0.679
300 level	19.6±6.4		
400 level	20.0±5.7		
500 level	20.1±7.8		
600 level	20.3±5.8		
Gender of respondent			
Male	19.0±5.6	3.134***	0.002
Female	21.1±6.3		

** One way Anova
*** Student t test
PSS Perceived stress scale

Table 2 shows the mean perceived stress score by level and gender. The mean perceived stress score for the respondents was 19.8±5.9. The mean perceived stress score increased as the level of the respondents increased hence the final year class, (600 level) had the highest stress score, (20.3±5.8) but the mean difference was not found to be statistically significant, (F=0.577, p=0.679). The mean stress score for the male students, (19.0±5.6) was lower than that of the females, 21.1±6.3) and the difference in mean was found to be statistically significant, (Student t=3.134, p-0.002)

Table 3: Prevalence of perceived stress among the respondents

Variable	Frequency (n=385)	Percent (%)
Prevalence of stress		
Stress	200	51.9
No Stress	185	48.1
Prevalence of perceived stress by academic levels	**(n=200)**	
200 level	39	45.3
300 level	41	51.9
400 level	38	48.1
500 level	46	58.2

600 level	36	58.1

Table 3 shows the prevalence of perceived stress among the respondents. The prevalence of perceived stress among the respondents was 51.9%. The 500 level class had the highest proportion of students who had high perceived stress, (58.2%) closely followed by the 600 level students, (58.1%)

Table 4: Factors associated with perceived high stress among the respondents

Variable	Stress among medical students (n=385)		p value on bivariate analysis	**AOR (95% CI) on multivariate analysis
	Yes N (%)	No N (%)		
Age of respondents				
<24 years	116 (54.7)	96 (45.3)	0.229	NA
≥24 years	84 (48.6)	89 (51.4)		
Gender				
Male	117 (47.4)	130 (52,6)	0.016	0.6 (0.4 - 0.9)
Female	83 (60.1)	55 (39.9)		1
Marital status				
Single	192 (52,0)	177 (48.0)	0.873	NA
Married	8 (50.0)	8 (50.0)		
Fathers' educational attainment				
Tertiary education	148 (55.6)	118 (44.5)	0.030	1.3 (0.8 - 2.0)
Others***	52 (43.7)	67 (56.3)		1
Educational attainment of Mother				
Tertiary education	137 (54.2)	116 (45.8)	0.231	NA
Others***	63 (47.7)	69 (52.3)		
Location of secondary school				
Urban	152 (52.8)	136 (47.2)	0.574	NA
Rural	48 (49.5)	49 (50.5)		
Period of training				
Pre-clinical	80 (48.5)	85 (51.5)	0.239	NA
Clinical	120 (54.5)	100 (45.5)		
Willingness to study Medicine again				
Yes	97 (43.9)	124 (56.1)	<0.001	0.5 (0.3 - 0.8)
No	103 (62.8)	61 (37.2)		1
Satisfaction with medical training				
Yes	97 (43.9)	124 (56.1)	<0.001	0.6 (0.4- 0.9)
No	103 (62.8)	61 (37.2)		1
Academic workload is much				
No	56 (58.9)	39 (41.1)	0.116	1.4 (0.9 – 2.3)
Yes	144 (49.7)	146 (50.3)		1

**Adjusted odds ratio, 95% Confidence interval

NA Not applicable
*** Secondary education and less

Table 4 shows the factors associated with perceived high stress among the respondents. The respondents who were males were about twice less likely to have perceived high stress when compared with the female students. (AOR=0.6; 95%CI: 0.4-0.9). The respondents who were willing to study Medicine again were twice less likely to have high perceived stress when compared with those who were not willing. (AOR=0.5; 95%CI: 0.3-0.8). Also, respondents who were satisfied with medical training were about twice less likely to have perceived high stress when compared with those who were not satisfied. (AOR=0.6; 95%CI: 0.4-0.9).

4. DISCUSSION

The mean perceived stress scale score in this study was 19.8±5.9 and this was close to that obtained among clinical medical students of a Nigerian university which was 20.76±5.58 [12] and that of first year medical students in India which was 20.29±6.24. [20] The mean score was lower than that obtained among medical students in Saudi Arabia [10] but higher than that obtained in a similar study in Romania. [21] From the results of this study the mean perceived stress scale score increased progressively as the academic levels of the students increased thus the final year students had the highest mean score. This finding is at variance with that obtained among clinical medical students in a university in northern Nigeria where the 400 level students had the highest mean stress score. [12] In another university in Saudi Arabia, the prevalence of stress decreased gradually as the academic level increased except for the final year students. [22] This may be an indication of the differences in the perceived stress and also of stressors in the various medical schools.

The prevalence of high perceived stress, (PSS≥20) among the respondents was 51.9%. This proportion is high and comparable to that obtained among clinical medical students in a university in Nigeria, 59.8% [12] and another medical school in Saud Arabia which was 59.8%. [10] This proportion of students who had high stress is lower than that obtained among first year medical students in India, [20] and among medical students in Egypt [23] and Saudi Arabia.[23] In another medical school in India and using a different tool, 22.3% of the students were severely stressed, [24] while in a medical school in Bangladesh, 54% of the students were perceived to be stressed. [25] These findings attest to the fact that medical school is a stressful environment and based on the different results obtained, it could be concluded that the stressors may be different in the various schools and geographical areas.

The highest prevalence of perceived high stress, 58.2% was found among the 5th year medical students and closely followed by students in the final year class, 58.1%. This finding is similar to that found among medical students in Casablanca, Morocco where the highest prevalence of stress was among the fifth year medical students. [26] In a similar study in Abraka, Nigeria, students in the fourth year had the highest proportion of students who were stressed. [27] All these academic levels mentioned are clinical classes. There has been a postulation that clinical medical training may be a source of high stress among medical students. [28] Also, the acquisition of applied clinical skills which is the hallmark of clinical training has been found to be associated with stress.[29] All these could explain why students in the clinical period of training have the highest proportion of those who were stressed.

From the results of this study, male medical students were about twice less likely to be stressed when compared with their female counterparts. Evidence abound that the female gender is more affected by stress and its effects. For example, from the results of a study in a Nigerian medical school, the female students were more susceptible to stress related illness when compared to the male students. [30] Also, a study in China revealed that female students were more likely to feel distressed when compared to the male students. [31] In Saudi Arabian universities, severe stress and prevalence of stress were found to be associated more with female medical students. [22, 32] This makes it necessary that good attention should be given to female medical students especially during the clinical training period. It appears that the predilection of the female gender to stress goes beyond the confines of the medical school. This is supported by the results from a study among consultant physicians in Saudi Arabia where the female doctors were twice more prone to stress when compared to male doctors. [33]

Also, the students who were willing to study Medicine again were twice less likely to be stressed when compared with those who did not show such willingness. Willingness to study Medicine again may be an indication of the inner resolve of the student to be a medical doctor. Perhaps they perceive the stress in the medical school as being good, hence not a stressful environment or one they are able to cope with. In a study among doctors in Saudi Arabia, those who perceived the working environment as stressful were about four times more likely to be stressed when compared with those who did not have that perception.[33] This may be an indication that the inner resolve of the students to be doctors may be of utmost importance in the pursuit of their career.

The students who were satisfied with their medical training were about twice less likely to be stressed when compared with those who were not satisfied. High academic stress among medical students has been found to result in poor academic performance. [12] It has been ascertained that stress among medical doctors impede their ability to provide good quality health care to the people. [13] The relevance of satisfaction with medical training is buttressed by the finding among medical students in Malaysia where life satisfaction decreased as perceived stress increased. [34] Similarly, in a national survey involving physicians in Canada, both male and female doctors experienced high levels of occupational stress which was associated with lower levels of satisfaction with their medical practice.[35] Also, in a study among university students in Barbados, higher levels of perceived stress was associated with lower levels of satisfaction with life. [36] This necessitates the need for emphasis on satisfaction with medical training among medical students. It may be likened to the promotion of well-being among medical students during the period of training. [4] It is however important to note that mentoring of students by lecturers and senior colleagues and support by family members will be of good effect.

An important limitation of this study was that assessment of perceived stress was based on self-reported information by the students and this could be a source of bias as it depended on respondents' interpretation of the questions. Moreover, the Cohen Perceived Stress Scale is based on how individuals felt or thought in certain ways within the past one month during which the students may have been passing through different experiences and academic activities in the medical school and these may have affected their various responses. Also, qualitative data collection methods may be necessary to fully understand the concept of stress and its causes and this will help for meaningful interventions.

5. CONCLUSION

The prevalence of high stress among the students was high. There is the need to appropriately manage stress in the medical school especially among the female students. Also, ensuring the satisfaction of medical students with their training though subjective will be of immense benefit.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

ETHICAL APPROVAL AND CONSENT

Ethical approval was obtained from the Research and Ethics Committee of Ebonyi University Abakaliki, Nigeria. The students were required to sign a written informed consent form before participating in the study. The nature of the study,

its relevance and the level of their participation were made known to them. They were also assured that all information as were provided in the questionnaire will be treated confidentially and anonymously.

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