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Original Article

## Perceived stress and stressors among first-year undergraduate students at a private medical school in Nigeria

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### المخلص

**أهداف البحث:** من المعروف أن التدريب الطبي ينطوي على العديد من الضغوطات التي يمكن أن تؤثر على صحة الطلاب. هذه أول دراسة يتم إجراؤها على الإطلاق بين طلاب الطب في السنة الأولى في جامعة خاصة في نيجيريا. تهدف هذه الدراسة إلى تحديد العوامل المرتبطة بالتوتر الملحوظ لطلاب الطب.

**طرق البحث:** استخدمت دراسة تحليلية مستعرضة. حيث تم توزيع استبانة شبة منظمة ومحقة لطلاب السنة الأولى طب. وتم تحليل البيانات وتقديم الإحصاءات الوصفية والتحليلية في ترددات، ونسب مئوية، ومتوسطات، وانحرافات معيارية.

**النتائج:** كان معظم المستجيبات من الإناث (72.2%) ومن المسيحيين (85.8%). ينظر 76% من طلاب السنة الأولى طب إلى كلية الطب على أنها مرهقة. وتعرض الإناث إلى التوتر أكثر من الذكور. إحصائياً، كان العرق والعوامل الشخصية مرتبطة بالتوتر الملحوظ.

**الاستنتاجات:** في هذه الدراسة، كان معدل انتشار التوتر الملحوظ مرتفعاً بين طلاب السنة الأولى طب. ويجب أن يكون الطلاب مستعدين لكيفية التعامل مع التوتر من خلال تطوير استراتيجيات المواجهة مثل نمط الحياة الصحي، والدعم الاجتماعي، والنشاط البدني وطلب المشورة عند الحاجة.

**الكلمات المفتاحية:** طلاب السنة الأولى طب؛ كلية الطب؛ جامعة خاصة؛ التوتر؛ غير المتخرجين

### Abstract

**Objectives:** Medical training has long been globally recognised as involving numerous stressors that can affect the well-being of students. This study, the first to be conducted among first-year medical students at a private university in Nigeria, aims to identify factors associated with students' perceived stress.

**Methods:** An analytical cross-sectional design was employed. A semi-structured pretested and validated questionnaire was administered to first-year medical students. The data were analysed using IBM SPSS version 25.0. Descriptive and analytical statistics were presented as frequencies, percentages, means, and standard deviations. The chi-square test was also used to identify the associations between categorical variables.

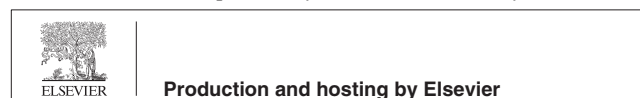
**Results:** The majority of the respondents were females (72.2%) and Christians (85.8%). Sixty seven percent of the participants perceived medical school as being stressful. More females than males were stressed. Statistically, ethnicity and intrapersonal factors were correlated with perceived stress.

**Conclusion:** In this study, the prevalence of perceived stress among first-year medical undergraduate students was high. Students should be prepared on how to cope with stress by developing coping strategies such as healthy lifestyle patterns, availing of social support, engaging in physical activity, and seeking counselling when needed.

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**Keywords:** First-year medical student; Medical school; Private university; Stress; Undergraduate

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## Introduction

Stress is an unavoidable experience resulting from the complex interactions between an individual and his or her environment. Stress occurs when an individual's resources are insufficient to cope with situational demands and pressures. Stress is a subjective experience that is more likely to arise in some situations than others. In addition, some individuals can be more prone to stress than others. Overall, stress can undermine the achievement of goals, both for individuals and organisations.<sup>1</sup> Depression, anxiety, and stress have been seen to lead to outcomes such as impaired functioning, burnout, and other health problems that can adversely affect individuals and society at large.<sup>2</sup> Stress has been linked to all leading physical causes of death—heart disease, cancer, and stroke.<sup>3</sup> Excessive stress has also been reported to result in physical and mental health problems and reduced self-esteem, as well as affect academic achievement and personal and professional development.<sup>4</sup> It predicts negative health behaviours such as smoking, alcohol abuse, illicit substance use, and sleeplessness, as well as relapses.<sup>5–7</sup>

Medical training has long been globally recognised as involving numerous stressors that can affect the well-being of students.<sup>4</sup> The prevalence of stress ranges from 21% to 94.5% across different phases (first year to final year) of medical training.<sup>8–10</sup> These high prevalence rates among medical students show that stress poses a huge public health problem. The level of stress among medical students has been reported to depend on the medical curriculum, examination system, and the administration of the medical school.<sup>11</sup> Stress can influence medical students' academic performance by decreasing attention span and affecting decision-making.<sup>11</sup> A study reported that psychological stress in the initial years of medical education could predict occupational stress in later years.<sup>12</sup>

In the Nigerian context, studying medicine in higher institutions of learning is considered to require more attention and focus than any other course at the university level. This is because of the vast syllabus and the requirement of participating in didactic academic activities. There has been an appreciable increase in the number of students who aspire to be medical doctors, which explains the increase in the number of enrollees into Nigerian medical schools. These increases in the student population contribute to students' stress, whether directly or indirectly, because their number outweighs the facilities and quotas of most schools, leading to a tendency to drop enrollees, especially when moving from the first to the second year. These students dropped from the

medical school are then offered other courses of study. Past studies showed that the prevalence of stress was highest among first-year medical students, which adversely affected their physical and cognitive capacities.<sup>13–16</sup>

In general, there has been a limited number of studies on perceived stress and its associated factors among first-year medical students in Nigeria. In this study, the first to be conducted among first-year medical students in any private university in Nigeria, the aim is to identify stressors and factors associated with perceived stress in this population.

## Materials and Methods

### *Study area*

The study was carried out at Afe Babalola University Ado-Ekiti (ABUAD), Ekiti State, Nigeria from 12th to 30th March 2018. This private university located in Ado-Ekiti, Ado Local Government Area, Ekiti State has over 6000 students on its main campus. The university has six colleges: Medicine and Health Sciences, Engineering, Sciences, Law, Social and Management Sciences, and Postgraduate studies. The College of Medicine and Health Sciences is located on the main campus in Ado-Ekiti, with annexes located in Ido-Ekiti and Are-Ekiti. The Bachelor of Medicine, Bachelor of Surgery programme in the College of Medicine and Health Sciences runs for six years before the degree is awarded. Students admitted into the first year are taught premedical courses such as biology, physics, chemistry, and other general courses. Students from all over the country are admitted to the university's medical college based on their secondary school academic performance.

### *Study design and population*

An analytical cross-sectional design was employed to assess the extent of the problem and gather baseline information as there has been no previous study on this population. The study population was ABUAD medical students recruited at the end of their first academic year.

### *Data collection/study instrument*

A semi-structured, pretested, and validated questionnaire was used for data collection. The questionnaire was adopted from Burge's<sup>17</sup> closed-ended university student stress items. The questionnaire was developed following revisions based on secondary exploratory factor analysis, reviewed academic stress instruments, and responses to Burge's open-ended questions about other university stressors. The questionnaire's reliability was tested with each section analysed separately. Cronbach's alpha ranged from 0.74 to 0.81.<sup>17</sup> The face and content validity were ascertained by demographers, epidemiologists, and biostatisticians in the university. The questionnaire was divided into two parts: Section A—socio-demographic characteristics including age, gender, religion, ethnicity, and monthly allowance and section B—perceived stress and stressors including those

related to academics, time, intrapersonal relations, family, finances, and the surrounding environment. Items from Burge's study were used to assess whether or not participants perceived medical school as being stressful.<sup>17</sup> Eight items were scored to determine if the 'academic' factor was a stressor. A 'yes' response was given a score of 1 while a 'no' response was scored 0. Scores from 0 to 4 represented non-stressors while scores above 4 represented stressors. For the 'time/balance' factor, which consisted of five items, scores from 0 to 3 represented non-stressors while scores above 3 represented stressors. For the 'intrapersonal/self' factor, which consisted of eight items, scores from 0 to 4 represented non-stressors while scores above 4 represented stressors. For the 'family/relationships/social' factor, which consisted of seven items, scores from 0 to 4 represented non-stressors while scores above 4 represented stressors. For the 'financial' factor, which included three items, scores from 0 to 1 represented non-stressors while scores above 1 represented stressors. For the 'environmental/campus' factor, which included nine items, scores from 0 to 5 represented non-stressors while scores above 5 represented stressors.

#### Sample size estimation

The estimated sample size required for the study was calculated thus:

$$n = \frac{Z^2_{1-\alpha/2} P(1-P)}{d^2}$$

n = estimated sample size required;  $Z^2_{1-\alpha/2}$ , the value of standard normal variables at 95% confidence interval = 1.96; P, the prevalence of undergraduate medical students who perceived excessive academic workload as a major stressor = 82.3%<sup>4</sup>; and d, the marginal error = 5%. The total estimated sample size required for the study was 224 respondents.

#### Data analysis

Data were collected, checked for errors, and manually entered into the computer for statistical analysis. IBM SPSS version 25.0 was used for the data analysis. Descriptive and analytical statistics were presented as frequencies, percentages, means, and standard deviations. The chi-square test was also used to determine the associations between categorical variables.

#### Results

Two hundred and twenty-four questionnaires were administered to the first-year medical students. However, only 212 questionnaires were completely filled; the response rate of 94.6% is acceptable for cross-sectional surveys.

Table 1 depicts the socio-demographic characteristics of the respondents. The mean age was  $17.3 \pm 1.05$  years, with the majority (69.8%) being under 18 years. The majority of the participants were females (72.2%), Christians (85.8%), and received a monthly sum of ₦10,000–₦59,999 from their parents/guardians.

**Table 1: Socio-demographic characteristics (N = 212)**

Variable	Frequency	Percentage
<b>Age</b>		
<18 years	148	69.8
18 years and above	64	30.2
Mean age	$17.3 \pm 1.05$ years	
<b>Gender</b>		
Male	59	27.8
Female	153	72.2
<b>Religion</b>		
Christianity	182	85.8
Islam	28	13.2
Others	2	1.0
<b>Ethnicity</b>		
Yoruba	53	25.0
Hausa	12	5.7
Igbo	56	26.4
Others	91	42.9
<b>Monthly Allowance<sup>a</sup></b>		
Less than ₦10,000	3	1.4
₦10,000–₦59,999	178	84.0
₦60,000–₦99,999	24	11.3
₦100,000 and above	7	3.3

<sup>a</sup> US\$1 = ₦360 (Nigerian Naira).

As shown in Table 2, 67% of the participants perceived medical school as being stressful. The majority of the students (52.8%) considered academics the major stressor, while a few considered other factors (time, finances, self, family, and environment) stressors. With respect to the association between perceived stress of medical school and the factors in this study, only ethnicity and intrapersonal factors were statistically associated (Table 3).

**Table 2: Stressors among the respondents.**

Variables	Frequency (N = 212)	Percentage
<b>Perceived stress</b>		
Not stressed	70	33.0
Stressed	142	67.0
<b>Academic</b>		
Non-stressor	100	47.2
Stressor	112	52.8
<b>Time/balance</b>		
Non-stressor	124	58.5
Stressor	88	41.5
<b>Intrapersonal/self</b>		
Non-stressor	161	75.9
Stressor	51	24.1
<b>Family</b>		
Non-stressor	158	74.5
Stressor	54	25.5
<b>Financial</b>		
Non-stressor	148	69.8
Stressor	64	30.2
<b>Environmental/campus</b>		
Non-stressor	140	64.0
Stressor	72	34.0

**Table 3: Factors associated with perceived stress among medical students.**

Variables	Perceived stress		$\chi^2$ /Fisher's exact	p value
	Stressed n (%)	Not stressed n (%)		
<b>Age</b>				
Less than 18 years	96 (64.9)	52 (35.1)	0.993	0.319
18 years and above	46 (71.9)	18 (28.1)		
<b>Gender</b>				
Male	37 (62.7)	22 (37.3)	0.674	0.412
Female	105 (68.6)	48 (31.4)		
<b>Religion</b>				
Christianity	121 (66.5)	61 (33.5)	0.837	0.706
Islam	20 (71.4)	8 (28.6)		
Others	1 (50.0)	1 (50.0)		
<b>Ethnicity</b>				
Yoruba	39 (73.6)	14 (26.4)	9.760	0.021 <sup>a</sup>
Hausa	5 (41.7)	7 (58.3)		
Igbo	31 (55.4)	25 (44.6)		
Others	67 (73.6)	24 (26.4)		
<b>Monthly Allowance</b>				
Less than ₦10,000	3 (100)	0 (0.0)	1.132	0.852
₦10,000–₦59,999	118 (66.3)	60 (33.7)		
₦60,000–₦99,999	16 (66.7)	8 (33.3)		
₦100,000 and above	5 (71.4)	2 (28.6)		
<b>Academic</b>				
Non-stressor	61 (61.0)	39 (39.0)	3.062	0.080
Stressor	81 (72.3)	31 (27.7)		
<b>Time/balance</b>				
Non-stressor	79 (63.7)	45 (36.3)	1.446	0.229
Stressor	63 (71.6)	25 (28.4)		
<b>Intrapersonal/self</b>				
Non-stressor	101 (62.7)	60 (37.3)	5.461	0.019 <sup>a</sup>
Stressor	41 (80.4)	10 (19.6)		
<b>Family</b>				
Non-stressor	102 (64.6)	56 (35.4)	1.648	0.199
Stressor	40 (74.1)	14 (25.9)		
<b>Financial</b>				
Non-stressor	97 (65.5)	51 (34.5)	0.460	0.498
Stressor	45 (70.3)	19 (29.7)		
<b>Environmental</b>				
Non-stressor	93 (66.4)	47 (33.6)	0.057	0.811
Stressor	49 (68.1)	23 (31.9)		

<sup>a</sup> Significant at  $p < 0.05$ .

## Discussion

In our study, 67% of the first-year medical students perceived their medical training to be stressful. This is lower compared to the proportion (94.2%) reported among medical students in the University of Calabar, a federal university in Nigeria.<sup>4</sup> These results, however, are not comparable as the above-mentioned study focused on students who were in their preclinical and clinical years. Stress can be expected to increase with progress in medical training.

The prevalence of perceived stress in our study is lower compared to the 82% reported among first-year medical students in Tamil Nadu, India,<sup>18</sup> 96.8% across India,<sup>19</sup> 90% in Pakistan,<sup>20</sup> and 85% in Maharashtra, India.<sup>16</sup> The prevalence in our study is a little higher than the 61.4% reported among medical students in Thailand.<sup>21</sup> However, as all these studies have used different instruments to measure stress, comparability is limited.

One of the reasons for the high prevalence of perceived stress in our study could be that most of these students were not adequately prepared for medical training. Another reason could be that most of these students were adolescents, who might just have been getting accustomed to being on their own, coupled with academic stress and adapting to an entirely new environment.

More females (68.6%) than males (62.7%) were found to be stressed. However, this association was not statistically significant ( $p = 0.412$ ). George and Joseph also found females to experience greater degree of stress than males in their study among first-year dental students in Kollam, India, though the association was also not statistically significant ( $p = 0.058$ ).<sup>22</sup> Similar findings were reported among medical students in Nigeria<sup>23</sup> and Pakistan.<sup>14</sup> Another study, however, reported male dental students as being more stressed than females.<sup>24</sup> There is no plausible reason for this gender difference.

In our study, the majority of the participants (52.8%) reported academics as being the major stressor. However, this was not found to be statistically significant ( $p = 0.080$ ). Many studies have reported academic-related factors as sources of stress; these include the vast syllabus<sup>4,19</sup> and the frequency of and performance in examinations.<sup>14</sup> It is quite alarming that 52.8% of these first-year medical students consider their academics to be a stressor. This is because in their first year, the courses they take are the same as students from other departments in the College of Medicine and Health Sciences. If they find academics stressful before actually beginning basic medical science courses such as anatomy, physiology, biochemistry, and integrated medical science, they may find it more difficult to cope when they get to their second and third years. There is definitely a need to counsel, orient, and teach these students various coping skills that may be needed for the completion of their medical training.

In assessing the factors associated with perceived stress among these undergraduate students, we found that those aged 18 years and above (71.9%) reported being more stressed than those who were aged under 18. All (100%) those with a monthly allowance of less than ₦10,000 were stressed. However, these associations were not statistically significant. Ethnicity ( $p = 0.021$ ) and intrapersonal issues ( $p = 0.019$ ) were the only factors statistically associated with perceived stress among the participants. There could be some socio-cultural issues peculiar to some ethnic groups that could make them feel stressed. The university in question is a multicultural community, and students from all over the country are admitted to the medical college on a yearly basis. This accounts for various cultural, socio-economic, and religious diversities among the students.

Intrapersonal issues also stood out as a significant stressor among these students. About 80.4% of those who reported intrapersonal issues to be stressors were perceived to be truly stressed. In the closed-ended questions, the stressors mentioned by students included intrapersonal issues such as trying to feel OK about themselves, experiencing a fear of failing, dealing with their personal issues, not being able to think clearly, feeling like they were not intelligent enough to be in medical school, not being sure about whether they had chosen the right degree, loneliness, and their physical health. All these intrapersonal issues can be tackled by good social support and the counselling unit of the university.

### Limitations

To the best of our knowledge, there has been no study on perceived stress in this population. The limitations of this study include its cross-sectional design, which limits inferences regarding causality; its questionnaire-based format, which may entail response bias; and the fact that the setting was a single college in a private university, which limits the generalisability of the findings to other private or public universities in the state and country.

### Conclusion

In our study, the prevalence of perceived stress was 67%. Our study shows that the prevalence of stress is high among

first-year undergraduate medical students at this private university. More female than male students were stressed. Ethnicity and intrapersonal problems were significant stressors. The earlier the issue of stress is addressed among these first-year students, the better. If the problem continues, it may eventually lead to stress-related conditions such as depression, anxiety, sleep difficulty, loneliness, inter- and intrapersonal conflicts, and other mental health problems.

The university management can also address ethnic differences by encouraging students to mingle by organising group-oriented activities with a cultural tone and by allowing students to have roommates from different ethnic backgrounds. These students need to be made aware of stress coping strategies and the importance of healthy lifestyle patterns, physical activity, and seeking counsel when needed. We also suggest that prior to admission to the medical college, students should be interviewed and assessed regarding depression, anxiety, and stress.

### Source of funding

None.

### Conflict of interest

The authors have no conflict of interest to declare.

### Ethical approval

All procedures performed were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

### Authors contributions

AAF and TO conceptualised and designed the study. AAF and TO drafted the questionnaire. TFO and IOO ensured face validity and administered the questionnaires to the respondents. AAF analysed and interpreted the data. AAF, TO, TFO, and IOO wrote the manuscript. All authors have critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

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