



**PREVALENCE AND CORRELATES OF ACADEMIC STRESS, ANXIETY AND DEPRESSION  
AMONG HEALTH SCIENCES STUDENTS AT AHMADU BELLO UNIVERSITY, ZARIA-NIGERIA**

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**ABSTRACT**

This study was aimed at investigating the prevalence of academic stress (and associated stressors), anxiety and depression among year two health sciences students at Ahmadu Bello University, Zaria, Nigeria. Depression, anxiety and stress scale-21 (DASS-21) and medical stressor questionnaire (MSSQ) were filled out by 188 selected participants through stratified random sampling after obtaining their agreement and written consent to participate. Preliminary reliability tests on the two instruments were conducted using 35 subjects before the main data collection. The reliability tests on the two instruments used revealed strong internal consistencies of the two instruments, with overall Cronbach's alpha values of 0.937 for DASS-21 and 0.929 for MSSQ. Mean levels of stress, anxiety and depression were found to be normal, moderate and normal, respectively. Significant and strong positive correlations between stress, anxiety and depression levels were observed. The prevalence of the conditions were found to be relatively high: 39.4% for stress, 68.1% for anxiety and 47.3% for depression at various degrees. However, the prevalence of severe to extremely severe levels of stress, anxiety and depression were relatively low for stress (6.9%) and depression (6.9%), and moderate for anxiety (33%). Academic-related stressors were the leading contributors to stress among the participants, with 46.8% perceiving high stress from this category of stressors. The findings of this study indicate a relatively high prevalence rate of stress, anxiety and depression among the participants while framing a critical view of the academic environment's impact on health sciences students' mental health, and underscoring the importance of proactive measures to support the well-being of this population.

**Keywords:** Anxiety, depression, health sciences students, Nigeria, stress

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**INTRODUCTION**

Stress is the non-specific response of the body to any demand (e.g. physical, academic, social, etc.). It is any stimulus that triggers the release of adrenocorticotrophic hormone (ACTH) and adrenal glucocorticoids together with the equally powerful sympathetic markers of stress [1, 2]. Academic stress is the body's response to academic-related demands at levels that exceed the students coping capabilities [3]. Physiological studies have suggested that stress can influence the immune, haemopoietic and endocrine systems [4]. Examination, as a factor that triggers, stress has been shown to have effects both psychologically and on stress response systems [5–7]. Researchers identified stress symptoms to include among others lack of energy, high blood pressure and feeling depressed [8–10]. Chronic stress leads to elevated levels of stress hormones for a long period. This causes the development of anxiety and mood disorders. Although anxiety can have many other causes, it is often a reaction to the occurrence of chronic stress. Still, both conditions can have similar symptoms, which include persistent thoughts,

unrelenting feelings of worry, fear, panic attacks or other physical symptoms such as insomnia and palpitation [11, 12].

It is estimated that 10–30% of students experience some degree of stress during their academic careers [3]. Existing reports show considerable and variable levels of academic stress among students of tertiary institutions across the African, Arabian and Asian regions [8, 13, 14]. Globally, pre-examination stress has been said to be common among students, especially in the medical field. Exams in medical schools are reported to be stressful as they involve much study and the results affect the students' future studies and training [15]. It is estimated that 5% of adults suffer from depression worldwide with stress being a key risk factor. Globally, depression is the major contributor to the overall burden of disease as well as the leading cause of disability and suicide [16]. Although data are scarce on the prevalence of depression in Sub-Saharan Africa, country-specific reported prevalence ranges between 3.5–4.9% in general populations, and a wide range of 1.9–89% in controlled populations, with an average of 4.1% in the designated W.H.O. region of Africa. In Nigeria, an average of 3.9% of the general

population and 7.8-30.6% of controlled population were reported to have depression, respectively [17]. Furthermore, depression is a major risk factor for suicidal tendencies, especially among health sciences students. A systematic review has estimated the prevalence of suicidal tendency among health sciences students to range from 7% to 35.6% within the preceding 12 months [18], for which a dire need for accurate suicide data was emphasized to identify the trends, establish predisposing and predictive factors, and identify targets for adequate interventions [19, 20].

Although several studies from different parts of the world have reported moderate to high levels of academic stress and depression among tertiary institution students [13, 17, 21–26], few researches have been done in that regard in Africa in general [27–29], and Nigeria in particular [17, 22]. Therefore, there is a need for more reports on academic stress and depression among students of tertiary institutions, especially from Sub-Saharan Africa, which was earlier stressed in a review [17], and especially from medical schools that are said to be more stressful [23, 29].

This study was carried out to determine the levels and possible etiologies of academic stress, anxiety and depression among year two health sciences students at Ahmadu Bello University, Zaria-Nigeria.

## MATERIALS AND METHODS

### Instruments and other materials

Depression Anxiety Stress Scale 21 (DASS-21) was adopted for the determination of levels of stress, anxiety and depression among the subjects. Medical Students Stressor Questionnaire (MSSQ) was used to assess the causes of stress among the participants.

### Target population (inclusion criteria)

The target population from which the subjects were drawn were the year two Bachelor of Science (BSc) Human Physiology, Bachelor of Science (BSc) Human Anatomy, Bachelor of Medical Laboratory Science (BMLS), Bachelor of Medical Radiography (BMR), Bachelor of Nursing Sciences (BNSc), Bachelor of Pharmaceutical Sciences (BPharm) and Doctor of Veterinary Medicine (DVM) students of Ahmadu Bello University, Zaria-Nigeria.

### Exclusion criteria

Students with a history of psychiatric disorders, endocrinological disorders, addiction to tobacco or alcohol and having a past and family history of diabetes mellitus and hypertension or any subject taking regular medicines were excluded.

### Ethical clearance

The study was conducted according to standard guidelines as outlined in the Ahmadu Bello University

research ethics policy. Ethical approval on the use of human subjects for the study was obtained from the Ethics Committee on Use of Human Subjects for Research of Ahmadu Bello University, Zaria-Nigeria (Approval number: ABUCUHSR/2024/008, National code: NHREC/TR/ABU-REC/21/03/23A).

### Sampling method

During the second week of the second semester (2023/2024 academic session, 27<sup>th</sup> to 31<sup>st</sup> May 2024), 188 volunteer subjects were drawn by stratified random sampling based on their various departments (Human Anatomy: 7, Human Physiology: 16, Medical Laboratory Sciences: 17, Medical Radiography: 14, Nursing Sciences: 58, Pharmaceutical Sciences: 37, and Veterinary Medicine: 39), and then through volunteer sampling at the strata levels. Students who volunteered to participate were used after obtaining their consent. The nature of the study and the reasons behind it were explained fully to the subjects.

The total population size was obtained using the students' registers. The minimum sample size,  $n$ , was estimated to be 384 based on Fischer's formula [30], as shown below.

$$n = \frac{z^2 \cdot p \cdot (1-p)}{d^2}$$

where  $n$  = minimum sample size;  $p$  = expected proportion in the population = 0.3 for previously reported 3-30% prevalence of stress, anxiety and depression [3, 16, 17];  $z(1-\alpha/2)$  = 1.96 being the value of the standard distribution corresponding to a significance level of  $\alpha$  (1.96 for a 2-sided test at the 0.05 level); and  $d$  = absolute precision = 0.05 for an allowed sampling error of 5%.

$$\text{Therefore, } n = \frac{(1.96)^2 (0.3) (0.5)}{(0.05)^2} = 230.496 \approx 230$$

The adjusted sample size,  $n_{\text{adj}}$ , was calculated using the formula below.

$$n_{\text{adj}} = \frac{n}{1 + n/N}$$

(Where  $n$  = minimum sample size and  $N$  = total population size).

Nine hundred (900) was estimated to be the total population size of year two undergraduate health sciences students of Ahmadu Bello University, Zaria-Nigeria based on their attendance.

$$\text{Hence, } n_{\text{adj}} = \frac{230.496}{1 + (230.496/900)} = 183.50 \approx 184$$

### Assessment of stress, anxiety and depression

Data on the levels of stress, anxiety and depression were collected by a self-administered questionnaire that comprises the following parts:

**1. Sociodemographic profile:** This includes age, gender, enrollment year, faculty, department, marital status, religion, ethnicity, residence location, income (per month), having a history of any medical condition, having past or family history of any psychiatric disorder, addiction to tobacco or alcohol, and taking any regular medicines.

## 2. Depression Anxiety Stress Scale 21 (DASS-21):

This self-report tool is designed to measure the emotional states of stress, anxiety and depression over the last week of an individual's life. Each of the three DASS scales contains 7 items divided into subscales with similar content. The stress scale is sensitive to levels of chronic nonspecific arousal. It also measures difficulty relaxing, nervous arousal, and being easily agitated, irritable, and impatient. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious effects, while the depression scale assesses dysphoria, hopelessness, devaluation of life, self-depreciation, lack of interest or involvement, anhedonia, and inertia. When completing the DASS-21, information from the respondent is required for the presence of a symptom over the previous week. Each

item was scored from 0 (did not apply to me) to 3 (applied to me very much or most of the time). Sum scores were computed by adding up the scores on the items per (sub) scale and multiplying them by a factor of 2. Sum scores for the total DASS-total scale therefore range between 0 and 126, and those for each of the subscales range between 0 and 42.

Recommended cut-off scores for conventional severity labels (normal, moderate, severe) have been made (Table 1). For the stress domain, normal scores range from 0–14 while pathological scores range from 15 to 34+. For the anxiety domain, the normal scores range between 0 and 7, while the pathological scores range from 8 to 20+. For the depression domain, the normal scores range from 0–9, while higher scores range from 10 to 28+. Cut-off scores of 60 and 21 are used for the total DASS score and the depression sub-scale, respectively. Hence, scores  $\geq 60$  (for DASS-total) and  $\geq 21$  (for the depression subscale) are labelled as "high" or "severe". To determine the prevalence of depression, DASS-21 scores with normal levels of stress, anxiety, and depression are coded as "0" (No), whereas those with mild, moderate, severe, or extremely severe levels are coded as "1" (Yes).

**Table 1:** Normal scores and severity ratings of Depression Anxiety and Stress Scale [31]

DASS-21 Domain	Stress	Anxiety	Depression
Normal	0 - 14	0 - 7	0 - 9
Mild	15 - 18	8 - 9	10 -13
Moderate	19 - 25	10 - 14	14 - 20
Severe	26 -33	15 - 19	21 - 27
Extremely Severe	> 37	> 20	> 28

Various studies demonstrated that the DASS-21 was found to have strong internal consistency. Cronbach's  $\alpha$  was 0.77 for stress; 0.80 for anxiety; 0.80 for depression; and 0.88 for overall. Cronbach's  $\alpha$  for the combination of anxiety and depression was 0.57, 0.70 for anxiety and stress, and 0.60 for depression and stress [26, 31].

## 3. Medical student stressor questionnaire (MSSQ):

A newly developed instrument by Yusoff and Yaacob [15], the Medical Students Stressor Questionnaire (MSSQ), was used to identify the sources of stress among the volunteers. The items on MSSQ represent 20 events that have been identified to be the most probable sources of stress in medical students. Respondents were requested to assess each event in them during the recent weeks by choosing from five responses: 'causing no stress at all', 'causing mild stresses', 'causing moderate stress', 'causing high stress' and 'causing severe stress'. The MSSQ is scored by assigning a value of 0–4 for each of the respective responses. A response of 'causing no stress at all' would be scored as 0 and a response of 'causing

severe stresses' scored as 4. The validation found that the MSSQ has good psychometric properties. It is a valid and reliable instrument that can be used to identify student's stressors as well as measure the intensity of the stressors [24, 32].

## Statistical analyses

The questionnaires were pretested on 35 randomly selected subjects to assess their internal consistency and reliability. Data were checked for completeness using Microsoft Excel (2013) and exported into Statistical Package for Social Sciences (SPSS, version 21.0) for analysis. Incomplete and inconsistent data were excluded from the analysis. The data were processed by using descriptive analysis and analytical methods, including frequency distribution, cross-tabulation, and summary measures. Student T-tests (for two groups, e.g. 'Males' and 'Females') or Tukey's LSD (for more than one group, e.g. 'Single', 'Married' and 'In a relationship') *post hoc* test were carried out to compare the levels of stress, anxiety or depression between various sociodemographic characteristics of the participants. Pearson's

correlation analysis was used to determine the correlations between the levels of stress, anxiety and depression. Linear logistic regression analysis was carried out to evaluate how stress determines anxiety and how stress or anxiety determines depression. Statistical significance was accepted at  $p < 0.05$ .

## RESULTS

These findings indicate good reliability and validity of DASS-21 and MSSQ among the participants. The reliability tests for the DASS-21 revealed good internal consistencies, with Cronbach's  $\alpha$  values of 0.937 for all the items, and 0.779, 0.856 and 0.874 for the stress, anxiety and depression domains,

respectively. Also, the reliability tests for MSSQ revealed excellent internal consistency and reliability of the instrument, with Cronbach's  $\alpha$  values of 0.929 for all the items, and 0.894, 0.927, 0.759, 0.870 and 0.688 for academic-related stressors, intrapersonal/interpersonal-related stressors, teaching/learning-related stressors, social-related stressors and drive/desire-related stressors, respectively.

The results in Table 2 shows that the mean levels of stress, anxiety, and depression were found to be normal, moderate and normal, respectively. The results also indicate significant and strong positive correlations between stress, anxiety and depression levels among the participants (Table 3).

**Table 2:** Means and standard deviations of stress, anxiety and depression among year two undergraduate health sciences students of Ahmadu Bello University, Zaria-Nigeria

DASS-21 Domain	N	Mean	Standard Deviation
Stress	188	<sup>0</sup> 13.17	7.774
Anxiety	188	<sup>2</sup> 12.33	8.048
Depression	188	<sup>0</sup> 9.43	6.889

<sup>0</sup> and <sup>2</sup> respectively indicate normal and moderate levels of respective conditions.

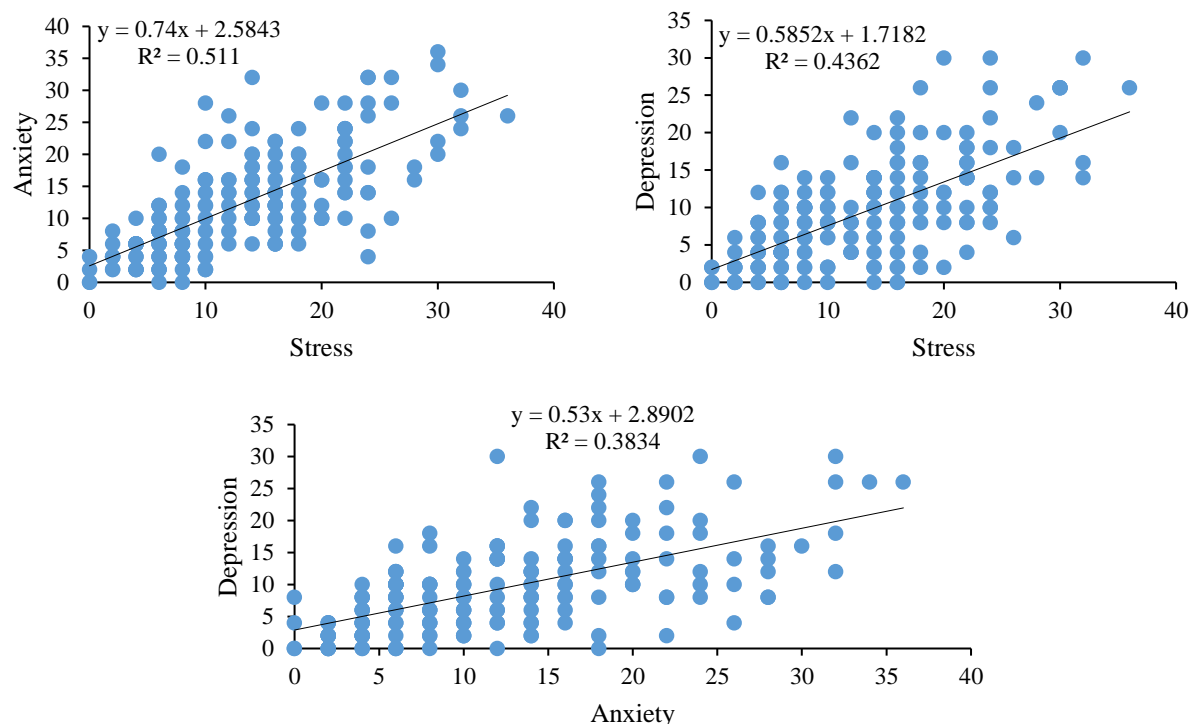
**Table 3:** Intercorrelation matrix between the domains of DASS-21 among year two undergraduate health sciences students of Ahmadu Bello University, Zaria-Nigeria

DASS-21 Domain	Stress	Anxiety	Depression
Stress	1	.712**	.737**
Anxiety	.712**	1	.705**
Depression	.737**	.705**	1

\*\*Correlation is significant at the 0.01 level (1-tailed).

In Figure 1, linear regression analyses revealed a significant, strong and positive relationship between stress and anxiety ( $R = 0.715$ ;  $R^2 = 0.511$ ;  $P = 0.000$ ; Anxiety level =  $0.74 \times \text{stress level} + 2.5843$ ); a significant, moderate and positive relationship between stress and depression ( $R = 0.660$ ;  $R^2 =$

$0.4362$ ;  $P = 0.000$ ; depression level =  $0.5852 \times \text{stress level} + 1.7182$ ); and also a significant, moderate and positive relationship between anxiety and depression ( $R = 0.619$ ;  $R^2 = 0.3834$ ;  $P = 0.000$ ; depression level =  $0.53 \times \text{anxiety level} + 2.8902$ ).



**Figure 1:** Scatter diagrams illustrating linear relationships between levels of stress, anxiety and depression among year two undergraduate health sciences students at Ahmadu Bello University, Zaria-Nigeria

In Table 4, the prevalence of the conditions was found to be relatively high: 39.4% for stress, 68.1% for anxiety and 47.3% for depression at various degrees. However, the prevalence of severe to extremely

severe levels of the conditions were relatively low for stress (6.9%), moderate for anxiety (33%) and also low for depression (6.9%).

**Table 4:** Prevalence of stress, anxiety and depression among undergraduate health sciences students of Ahmadu Bello University, Zaria-Nigeria

Grade	Stress (%)	Anxiety (%)	Depression (%)
Normal	60.6	31.9	52.7
Mild	17.0	8.5	21.3
Moderate	15.4	26.6	19.1
Severe	6.4	13.3	5.3
Extremely Severe	0.5	19.7	1.6

Looking at the sociodemographic characteristics of the participants (Table 5), most of them were aged 20-24 years (77.1%), with only 9.1% aged 18-19 years and 13.8% older than 24. Among these age categories, the stress levels were normal for participants older than 19 years and mild for those under 19. The anxiety levels were moderate for participants older than 19 years, but severe for younger ones. The depression level was normal for participants older than 24 years, mild for those 20-24 years, and moderate for the younger ones.

Most of the participants were females (55.3%), with both males and females having normal stress levels. Both the males and the females have moderate levels of anxiety. The depression levels were mild in the females and normal in the male participants.

Most of the participants were single (91%), with only 5.3% married and 3.7% in a relationship. The stress levels were found to be normal when the participants were considered to be single, married or in a relationship. However, participants in relationship status were found to have severe levels of anxiety (significantly higher than that of single participants), while those in single and married categories had moderate levels of anxiety. The depression levels were normal for married participants and mild for singles and those in a relationship.

The participants were mostly Muslims (91.1%), with only 8.5% Christians. The stress levels were normal in the Muslims and mild in the Christian participants (significantly higher than in the Muslims). More so, the Christians were found to have severe levels of anxiety, which was also significantly higher than that of the Muslims, in whom it was moderate.

Also, the depression level of Christians was moderate and significantly higher than that of the Muslim participants, in whom it was normal.

Considering the tribes of the participants, most of them (58.5%) were Hausas, followed by Yorubas (11.7%), with the Fulanis, Ebiras and Nupes making up 14% and other tribes the remaining. The individual tribes looked at separately had normal to only mild levels of stress, with the Hausas having the lowest level, which was significantly lower than those of Yoruba and Fulani participants. The anxiety levels of individual tribes were moderate to severe, with the Fulanis having significantly higher anxiety levels compared to the Hausas. Also, the depression level of Ebira participants was found to be moderate and significantly higher than that of the Hausas who had the least (at a normal level), with the other tribes having mild levels of the condition.

As for residence location, 79.8% of the participants lived in the University hostels, a small percentage (1.1%) lived in the University quarters, and 8.5% lived just outside the University (Samaru area, the location of the University's Main Campus), and 14.9% attending from farther locations. Among

these, those living in the Samaru area had severe levels of anxiety, with mild and moderate levels of stress and depression, respectively. The participants living in other locations had normal to moderate levels of all the conditions.

Lastly, the results indicate that the participants had normal levels of stress regardless of their departments. The depression levels were also normal or mild for the various departments. However, a severe level of anxiety was observed among participants in the Human Physiology department, which was significantly higher than those of participants in the Medical Laboratory Sciences, Medical Radiography and Veterinary Medicine departments, who had mild to moderate levels of the condition. Also, the anxiety levels of Nursing Sciences and Pharmaceutical Sciences participants, although moderate, were significantly higher than those of Medical Laboratory Sciences participants. In the same vein, Pharmaceutical Sciences students also had significantly higher levels of anxiety when compared to that of Veterinary Medicine students. Participants in Human Anatomy students had moderate levels of anxiety.

**Table 5:** Sociodemographic characteristics and their relationships with stress, anxiety and depression among year two health sciences students of Ahmadu Bello University, Zaria-Nigeria

Baseline characteristic	N	%	Stress	Anxiety	Depression
<b>Age (years):</b>					
18-19	17	9.1	<sup>1</sup> 14.94 (8.4)	<sup>3</sup> 14.94 (6.7)	<sup>1</sup> 10.71 (6.8)
20-24	145	77.1	<sup>0</sup> 12.86 (7.7)	<sup>2</sup> 12.26 (8.3)	<sup>1</sup> 9.45 (6.9)
>24	26	13.8	<sup>0</sup> 13.77 (8.1)	<sup>2</sup> 11.00 (7.5)	<sup>0</sup> 8.46 (6.9)
<b>Sex:</b>					
Female	104	55.3	<sup>0</sup> 13.29 (7.3)	<sup>2</sup> 13.19 (8.1)	<sup>1</sup> 9.52 (7.0)
Male	84	44.7	<sup>0</sup> 13.02 (8.4)	<sup>2</sup> 11.26 (7.9)	<sup>0</sup> 9.31 (6.8)
<b>Marital status:</b>					
Single	171	91.0	<sup>0</sup> 13.29 (8.0)	<sup>2</sup> 12.06 (8.1)	<sup>1</sup> 9.60 (7.0)
Married	10	5.3	<sup>0</sup> 12.00 (4.3)	<sup>2</sup> 12.40 (6.2)	<sup>0</sup> 6.20 (2.7)
In a relationship	7	3.7	<sup>0</sup> 12.00 (4.6)	<sup>3</sup> <b>18.86 (7.4)<sup>a</sup></b>	<sup>1</sup> 9.71 (6.5)
<b>Religion:</b>					
Islam	172	91.5	<sup>0</sup> 12.79 (7.8)	<sup>2</sup> 11.92 (7.9)	<sup>0</sup> 8.95 (6.6)
Christianity	16	8.5	<sup>1</sup> <b>17.25 (7.0)<sup>a</sup></b>	<sup>3</sup> <b>16.75 (8.7)<sup>a</sup></b>	<sup>2</sup> <b>14.50 (7.6)<sup>a</sup></b>
<b>Tribe:</b>					
Hausa	110	58.5	<sup>0</sup> 11.55 (7.4)	<sup>2</sup> 11.09 (7.5)	<sup>0</sup> 8.22 (6.3)
Yoruba	22	11.7	<sup>1</sup> <b>16.55 (7.8)<sup>a</sup></b>	<sup>2</sup> 13.91 (9.7)	<sup>1</sup> 10.55 (6.7)
Fulani	16	8.5	<sup>1</sup> <b>16.38 (9.4)<sup>a</sup></b>	<sup>3</sup> <b>15.50 (7.8)<sup>a</sup></b>	<sup>1</sup> 11.13 (7.3)
Ebira	8	4.3	<sup>1</sup> 14.75 (9.3)	<sup>3</sup> 16.50 (11.5)	<sup>2</sup> <b>14.75 (10.8)<sup>a</sup></b>
Nupe	4	2.1	<sup>0</sup> 13.50 (6.6)	<sup>3</sup> 16.00 (11.9)	<sup>1</sup> 10.00 (5.9)
Others	28	14.9	<sup>1</sup> 14.57 (6.7)	<sup>2</sup> 12.43 (6.7)	<sup>1</sup> 10.71 (7.2)
<b>Residence location:</b>					
Hostel	150	79.8	<sup>0</sup> 12.85 (7.4)	<sup>2</sup> 12.00 (7.9)	<sup>0</sup> 8.99 (6.7)
University quarters	2	1.1	<sup>1</sup> 17.00 (1.4)	<sup>2</sup> 11.00 (1.4)	<sup>0</sup> 9.00 (7.1)
Samaru area	16	8.5	<sup>1</sup> 14.75 (8.9)	<sup>3</sup> 14.63 (9.7)	<sup>2</sup> 11.75 (6.5)

Farther locations	20	10.6	<sup>0</sup> 14.00 (10.3)	<sup>2</sup> 13.16 (8.3)	<sup>2</sup> 10.95 (8.5)
<b>Department:</b>					
Human Anatomy	7	3.7	<sup>0</sup> 14.00 (6.1)	<sup>2</sup> 11.71 (4.7)	<sup>0</sup> 7.71 (9.5)
Human Physiology	16	8.5	<sup>0</sup> 14.13 (7.3)	<sup>3</sup> <b>16.63 (10.2)</b>	<sup>1</sup> 12.13 (7.7)
Medical Laboratory Sciences	17	9.0	<sup>0</sup> 10.24 (5.1)	<sup>1</sup> 8.00 (4.3) <sup>b</sup>	<sup>0</sup> 8.82 (3.3)
Medical Radiography	14	7.4	<sup>0</sup> 13.86 (7.6)	<sup>2</sup> 10.14 (7.5) <sup>b</sup>	<sup>1</sup> 10.00 (7.6)
Nursing Sciences	58	30.9	<sup>0</sup> 13.93 (8.6)	<sup>2</sup> <b>13.72 (8.4)<sup>c</sup></b>	<sup>0</sup> 8.90 (6.6)
Pharmaceutical Sciences	37	19.7	<sup>0</sup> 14.22 (6.9)	<sup>2</sup> <b>13.41 (7.4)<sup>c</sup></b>	<sup>1</sup> 10.11 (6.4)
Veterinary Medicine	39	20.7	<sup>0</sup> 11.54 (8.7)	<sup>2</sup> 10.26 (7.9) <sup>be</sup>	<sup>0</sup> 8.82 (7.9)

a, b, c and e the mean differences are significant at the 0.05 level when compared with the first, second, third and fifth categories of participants in various sections, respectively. 0, 1, 2 and 3 respectively indicate normal, mild, moderate and severe levels of respective conditions. Values are expressed as Mean (SD)

Looking at the possible causes of stress among the participants, most of them reported academic-related stressors to cause high (46.8%) or severe (26.6%) levels of stress, with 22.9% of them reporting this category of stressors to cause moderate levels of stress and only 3.7% reporting them to cause mild level in them. Most of the participants (37.2%) reported intrapersonal and interpersonal-related stressors to

cause only mild levels of stress in them, with the remaining reporting the category of stressors to cause moderate (23.9%), high (23.9%) or severe (14.9%) levels in them. For teaching and learning-related stressors, most of the participants perceived them to cause moderate stress in them, and the remaining perceived them to cause mild (30.3%), high (30.3%) or severe (8%) degrees of stress in them.

**Table 6:** Degrees of stress caused by various categories of stressors among year two health sciences students at Ahmadu Bello University, Zaria-Nigeria.

Degree of stress	ARS	IRS	TLRS	SRS	DRS	GARS
<b>Mild</b>	3.7	<b>37.2</b>	24.5	30.3	<b>66.0</b>	<b>37.2</b>
<b>Moderate</b>	22.9	23.9	<b>35.6</b>	<b>36.2</b>	20.2	33.5
<b>High</b>	<b>46.8</b>	23.9	31.9	30.3	8.5	25.0
<b>Severe</b>	26.6	14.9	8.0	3.2	5.3	4.3

ARS: academic-related stressors; IRS: intrapersonal and interpersonal-related stressors; TLRS: teaching and learning-related stressors; SRS: social-related stressors; DRS: drive and desire-related stressors; GARS: group activities-related stressors.

## DISCUSSION

The DASS-21 and MSSQ demonstrated strong internal consistencies, validating the reliability of the findings regarding the emotional states of the participants. This is also consistent with reports of previous studies that demonstrated these instruments to have strong internal consistencies and reliabilities in assessing the constructs they were designed to assess (i.e. stress, anxiety, depression and medical stressors) [24, 26, 31, 32].

The mean levels of stress, anxiety, and depression among the students were observed to be normal, moderate, and normal, respectively. However, significant positive correlations were found between stress, anxiety, and depression levels. This aligns with earlier findings that suggest these conditions are interrelated among students facing high academic demands [17, 26, 33]. Medical and health sciences students have often been reported to be highly stressed [14, 15, 26, 34–36]. Previous researches indicate that high levels of anxiety and

depression are common among medical students worldwide, often due to the rigorous academic demands placed upon them [13–15, 26, 37]. This study found relatively high prevalence rates of stress, anxiety and depression among the participants, with 39.4% experiencing stress, 68.1% experiencing anxiety, and 47.3% experiencing depression. Severe to extremely severe stress, anxiety and depression were noted in 6.9%, 33% and 6.9% of the participants, respectively. The high prevalence of anxiety and a considerably significant rate of depression among the students suggest a pressing need for mental health resources and counselling services tailored for health sciences students. Addressing mental health can help improve academic performance and the students' overall well-being. The findings of the study are consistent with existing researches that highlight the challenges faced by medical and health sciences students regarding academic stress, anxiety, and depression, emphasizing the need for targeted interventions and support systems [14, 15, 26, 34–37]. The study also emphasizes the necessity for more research on mental health issues and associated

complications like ideation to suicide within medical schools, especially in Africa, as also previously emphasized [17, 18, 50].

Analysis showed variations in stress, anxiety, and depression based on demographic factors like age, sex, marital status, religion, and tribe [38–41]. For instance, participants in a relationship status reported higher anxiety levels, while the Christians exhibited higher levels of stress, anxiety and depression compared to their Muslim counterparts. Higher perceptions of anxiety and depression have also been reported earlier [42], even though being in a relationship has been associated with higher levels of well-being compared to being single [43].

Also, the severe anxiety levels reported by Fulani students and those in specific departments (like Human Physiology) highlight the need for targeted interventions. While water insecurity especially due to climate change has been associated with emotional distress and mental health challenges, particularly high level of anxiety, among Fulani pastoralists [44], it is not clear why Fulani students perceive higher level of anxiety than their counterparts in other tribal groups. It may be pertinent to further investigate this finding. Programs focusing on stress management and coping strategies could be beneficial, particularly for high-risk groups. The highlighted differences in stress, anxiety, and depression levels based on sociodemographic factors is a common observation in the literature. For instance, female students often report higher levels of anxiety [38, 41, 45], while various studies have shown inconsistencies in stress levels between different demographic groups [14, 23].

Academic-related stressors were the leading contributors to high levels of stress among participants in this study, with most of them (up to 46.8%) indicating high and 26.6% indicating severe stress from this category. Intrapersonal and interpersonal stressors also contributed, but to a lesser extent, with only 14.9% implicating it in causing severe stress and most of them (37.2%) indicating it to only cause mild stress in them. These indicate that academic-related stressors significantly contribute to the mental health issues faced by students. Similar to other studies, the current research identified academic-related stressors as the primary source of stress among students. Scores of studies have specifically reported that academic pressures significantly contribute to stress in medical students [13, 15, 46–48].

## CONCLUSION AND RECOMMENDATIONS

The findings of this study indicate good reliability and validity of DASS-21 and MSSQ among the health sciences student population in Ahmadu Bello University, Zaria-Nigeria. The tool could be used for the assessments of stress, anxiety and depression levels and the determination of stressors among this population.

The findings of this study found relatively high prevalence rates among participants, with 39.4% experiencing stress, 68.1% experiencing anxiety, and 47.3% experiencing depression. Severe to extremely severe levels of stress, anxiety and depression were noted in 6.9%, 33% and 6.9% of the participants, respectively. While the overall stress level was found to be normal (i.e. within the score range of 0-14), the high incidence of anxiety and considerable depression levels were concerning, highlighting the need for mental health support among health sciences students, and echoing the calls from previous studies that emphasize the importance of addressing mental health issues in medical schools [18, 26, 47, 49].

The findings in this study frame a critical view of the academic environment's impact on health sciences students' mental health and underline the importance of proactive measures to support their well-being. Faculty and administration should be made aware of the stressors identified, enabling them to create a supportive environment that fosters both academic success and mental well-being. Training staff to recognize signs of mental distress can facilitate early intervention.

The study also stresses the need for more studies on mental health issues and associated complications within medical schools. Such data can help in developing region-specific strategies and a better understanding of the unique challenges faced by these students.

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