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## Assessment of Level and Sources of Stress Among Allied Health Sciences Students of Bayero University Kano: A Comparison Between Clinical and Pre-Clinical Students

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### ABSTRACT

This study is to assess the level and sources of stress among allied health sciences students of Bayero University Kano. A total of 230 participants were recruited in this cross-sectional survey using stratified sampling technique. The data on level and sources of stress was assessed using medical student stressor questionnaire. Descriptive statistics of means, standard deviations, frequency and percentage were used to summarise the data while inferential statistic of independent *t*-test and one-way ANOVA were used to test the differences between or among variables. The study revealed that majority of the students of Faculty of Allied Health Science's level of stress ranges from moderate to high level of stress. Academic related stress was the highest stressor and pre-clinical phase of study was found out to be more stressful than clinical phase of study ( $p < 0.05$ ). No significant difference in the level of male and female student's level and sources of stress was found ( $p > 0.05$ ). This study found no significant difference in the level of stress among the various departments of Faculty of Allied Health Sciences ( $p > 0.05$ ). The level of stress among these students ranges from moderate to high level of stress. Academic related stress was the highest stressor among the students. Therefore, curriculum, mode of assessment and other academic related activities for allied health sciences students should be set in the range of their coping limit.

**Keywords:** *Allied health sciences, Level of stress, Sources of stress*

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## INTRODUCTION

Stress is the third human problem after death and taxes (1). Stress is a common phenomenon to mankind, no matter how rich one is. Eustress is a positive form of stress that is beneficial to an individual (2); it is a response when there is balance between what one has and the demands that

come across and is psychologically boosting. On the other hand, Selye defined distress as that form of stress which an individual fails to cope with (3).

Tertiary institution has been considered as highly stressful environment to students (4). Studying in tertiary institutions is one of the stressful stages of life characterised by lifestyle changes of the students which are

stress stimulating agents (5). The students are exposed to many stressful events such as meeting new faces, staying away from home, family and studying (6).

Academic stress and low social support are the highest sources of stress to the clinical medical and physiotherapy students with medical students being more stressed by academic workload and physiotherapy students by low social support. The study further cited physiotherapy students to have higher resilience than the medical students (7). Similarly, a study by Othman et al. (8) showed that academic requirements are the major sources of stress to health science students.

Clinical phase of study is perceived to be more stressful than the pre-clinical phase (9). Female students had higher stress than male students in response to academic stressors (10). The distress affecting health students can make them personally and socially incapacitated which is not good to the future of health sector as these students are thought to be the future health personnel. However; there is dearth of literature assessing stress in allied sciences training especially in northern Nigeria and hence the need of such study. The study is significant in the sense that it highlighted the level and sources of stress among the students which may be used to develop positive coping strategy. The study aimed to determine the level and sources of stress among allied health sciences.

## METHODOLOGY

### Study Design

The study was a cross-sectional study.

### Population of Study

The population of the study were the full time undergraduate students of the Faculty of Allied Health Sciences (Physiotherapy, Nursing, Medical Laboratory, Science,

Radiography, and Optometry) both clinical and pre-clinical students.

### Sample Size and Sampling Techniques

The sample size was calculated using the formula,  $n = Z^2 P (1-P)/e^2$

where

n = sample size

N = population size = 1,700 (570 pre-clinical and 1,130 clinical students)

e = error margin which is the alpha value 0.05

P = prevalence of stress among Nigerian medical university students 23% (11).

$$1.96^2 \times 0.23(1-0.23)/0.05^2 = 272$$

The sampling technique used was stratified sampling technique since the population was heterogeneous. The students were divided into two strata, of pre-clinical and clinical students. Thereafter, a simple random sampling, a form of probability sampling technique was employed to draw the final sample from each stratum. The study was carried out after mid semester break when half of the syllabus was expected to be covered.

### Setting

Faculty of Allied Health Sciences is one of the five faculties of College of Health Sciences at Bayero University Kano. It comprises five departments namely; Physiotherapy, Radiography, Nursing, Medical Laboratory Science, and Optometry.

### Data Collection Instrument

The data collection instrument was a structured and self-administered questionnaire consisting of two sections; A and B. Section A enquired the student's demographic data while Section B enquired the stressors as perceived by the students using Medical Student Stressors Questionnaire (MSSQ). The MSSQ

(English version) was used to identify sources of stress. Items in the MSSQ represented 40 events that were reported to be possible stressors to health science students (12). The questionnaire was rated using 5-points Likert's scale namely: "causing no stress", "causing mild stress", "causing moderate stress", "causing high stress" and "causing severe stress". The questionnaire was scored from 0 to 4 where 0, 1, 2, 3, and 4 were scored to no stress, mild stress, moderate stress, high stress and severe stress respectively.

The MSSQ comprises 6 domains namely:

- (a) Academic-related stress (ARS)
- (b) Interpersonal- and intrapersonal-related stress (IRS)
- (c) Teaching and learning related-stress (TLRS)
- (d) Social-related stress (SRS)
- (e) Desire-related stress (DRS)
- (f) Goal-related stress (GARS)

ARS was represented by items 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 16 and 17; IRS was represented by items 25, 26, 27, 28, 29, 30 and 31; TLRS was represented by items 19, 20, 22, 34, 35, 36 and 37; SRS was represented by items 18, 21, 23, 24, 38 and 39; DRS was represented by items 32, 33 and 40; GARS was represented by items 12, 13, 14 and 15. To get the mean of each domain, the score of the domain was divided by the total number of items representing the domain. Mean of each domain was computed to identify the level of stress as follows: mean value of;

- (a) 0.00–1.00 means mild stress
- (b) 1.01–2.00 means moderate stress
- (c) 2.01–3.00 means high stress
- (d) 3.01–4.00 means severe stress (10)

The questionnaire has internal consistency of Cronbach's alpha 0.954 for assessment of

stressors of health sciences students which made it reliable for such purposes (13).

### Data Collection Procedure

An introductory letter was collected from Department of Physiotherapy, Bayero University Kano and was taken to ethical approval committee of College of Health Sciences for ethical clearance. Participation was made voluntary by using informed consent form. The questionnaires were distributed to allied health students that consented to participate and were present at the faculty premises, old campus (Mamud Tukur theatre or Biochemistry complex) where the clinical and pre-clinical students take their lectures respectively. Students were given 30 minutes to answer the questionnaire thereafter, the questionnaires were collected. Two hundred and eighty questionnaires were distributed but 230 were retrieved.

### Data Analysis

Data analysis was done in SPSS Version 20 utilising both descriptive and inferential statistics. Frequency distribution tables, percentages, means and standard deviations were the descriptive statistics used for data summary and illustrated using charts while inferential statistics of independent *t*-test was used to compare pre-clinical and clinical student's level of stress and sources of stress, independent *t*-test to compare between male and female student's level of stress and sources of stress, and ANOVA to compare the differences between the various departments. All assumptions were made at 0.05 significance level.

## RESULTS

A total number of 280 students were proposed to participate in this study but only 230 students completed and returned the questionnaires giving a response rate of 82%.

## Socio-demographic Characteristics of the Students

The socio-demographic characteristics of the students are summarised in Table 1. Two hundred and thirty students participated in this study, majority 113 (49.1%) were within the age range of 21–25 years while 68 (29.6%) were within the age range of 16–20 years, 44 (19.1%) were within the age range of 26–30 years, and 5 (2.2%) were above 30 years of age respectively. Of the respondent's gender, 116 (50.4%) were male and 114 (49.6%) were female. Regarding the level of study (academic year), 300 level students were the majority of the participants 68 (29.6%), followed by 200 level students 59 (25.7%), then 400 level students 42 (18.3%), 100 level students 33 (14.5%) while, the minority of the students 28 (12.2%) were 500 level students. Nursing students has the highest participants 89 (38.7%), followed by Physiotherapy 67 (29.1%), Medical Laboratory Science 26 (11.3%), Optometry 25 (10.9%), and least Radiography 23 (10%). One hundred and twenty five students (54.3%) were from clinical and 105 (45.7%) from pre-clinical.

### Perceived Stress by the Students (Level)

Of 230 students that participated in the study, 18 (7.8%) are mildly stressed, 113 (49.1%) are moderately stressed, 98 (42.6%) are highly stressed, and only 1 (0.4%) is severely stressed as can be seen in Figure 1.

### Stressors as Perceived by the Students

Table 2 showed that ARS has the highest score which is 2.04, indicating that it was perceived as the highest stressor to the students. The other stressors were perceived as causing moderate stress by the students. In descending order of other stressors, TLRS mean of 1.87 followed by SRS (1.73), IRS (1.72), GARS (1.69), and DRS (1.43). Based on the results, it appeared that the major sources of stress experienced

**Table 1:** Socio-demographic characteristics of the students

Variables	N	%
Age		
16–20	68	29.6
21–25	113	49.1
26–30	44	19.1
Others	5	2.2
Gender		
Male	116	50.4
Female	114	49.6
Level of study		
100	33	14.3
200	59	25.7
300	68	29.6
400	42	18.3
500	28	12.2
Department		
Physiotherapy	67	29.1
Radiography	23	10.0
Medical lab	26	11.3
Nursing	89	38.7
Optometry	25	10.9
Phase		
Pre-clinical	105	45.7
Clinical	125	54.3
Tribe		
Hausa	176	76.5
Yoruba	11	4.8
Igbo	1	0.4
Others	42	18.3

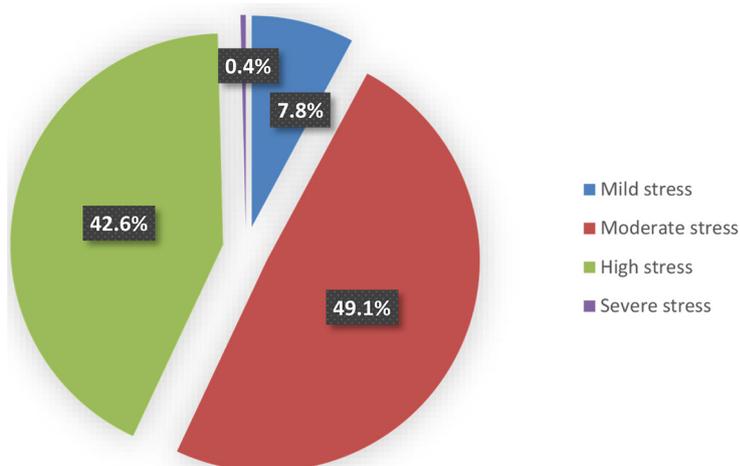
Note: n = frequency; % = percentage

by the students were related to academic requirements.

### Comparison of Level of Stress between Pre-clinical and Clinical Student's

Table 3 shows the result of independent *t*-test differential analysis in perceived stress between pre-clinical and clinical students. There was significant difference in the level of pre-clinical and clinical student's perceived stress ( $p < 0.05$ ).

**Level of stress among Faculty of Allied Health Sciences students**



**Figure 1:** Percentage of student’s perceived of stress.

**Table 2:** Sources of stress based on domains of stress

Domain	Mean	Std. Dev
ARS	2.04	0.63
IRS	1.72	0.92
TLRS	1.87	0.77
SRS	1.73	0.71
DRS	1.43	0.93
GARS	1.68	0.76

Note: Score interpretation: 0.00–1.00 = Mild; 1.01–2.00 = Moderate; 2.01–3.00 = High; 3.01–4.00 = Severe

**Table 3:** Independent *t*-test differential analysis in level of stress between pre-clinical and clinical students

Stressors	Phase	Mean	SD	t-cal	p-value
Level of stress	Pre-clinical	1.91	0.55	3.57	0.00
	Clinical	1.70	0.57		
<b>Comparison in stressors (sources of stress)</b>					
ARS	Pre-clinical	2.12	0.58	1.89	0.06
	Clinical	1.96	0.66		
IRS	Pre-clinical	1.92	0.98	3.03	0.03
	Clinical	1.56	0.84		
TLRS	Pre-clinical	2.02	0.78	2.86	0.05
	Clinical	1.73	0.74		
SRS	Pre-clinical	1.92	0.76	3.79	0.05
	Clinical	1.57	0.63		
DRS	Pre-clinical	1.66	0.95	3.46	0.01
	Clinical	1.24	0.89		
GARS	Pre-clinical	1.79	0.73	1.82	0.070
	Clinical	1.60	0.79		

### Comparison of Stressors between Pre-clinical and Clinical student's

Table 3 shows the result of independent *t*-test differential analysis of stressors between pre-clinical and clinical students. There was no significant difference in ARS, TLRS, SRS and GRS score of pre-clinical and clinical students ( $p > 0.05$ ) but there was a significant difference in IRS and DRS score of pre-clinical and clinical ( $p > 0.05$ ).

### Comparison between Male and Female Students' Level of Stress

Table 4 shows the result of independent *t*-test differential analysis of perceived stress between male and female students. There was no significant difference in perceived stress between male and female students ( $p > 0.05$ ).

### Comparison between Male and Female Students' Stressors

Table 4 shows the result of independent *t*-test differential analysis of stressors between male and female students. There was significant difference in the ARS score of male and female students ( $p = 0.041$ ) but

no significant difference in all other domain ( $p > 0.05$ ).

### Comparison of Level of Stress among Various Departments of Faculty of Allied Health Sciences

The result of one-way ANOVA shows no significant difference of perceived stress among the various departments of Faculty of Allied Health Sciences ( $p > 0.05$ ) as can be seen in Table 5.

### Comparison of Stressors among Various Departments of Faculty of Allied Health Sciences

Table 5 shows the result of one-way ANOVA to compare the stressors among various departments of Faculty of Allied Health Sciences. There was no significant difference across all domains of MSSQ among various departments of Faculty of Allied Health Sciences in ( $p > 0.05$ ).

## DISCUSSION

The study reveals that majority of the students of Faculty of Allied Health

**Table 4:** Independent *t*-test differential analysis in level of stress between male and female students

Stressors	Gender	X	SD	t-cal	p-value
Level of stress	Male	1.79	0.85	-1.01	0.32
	Female	1.86	0.58		
<b>Comparison of stressors (sources of stress)</b>					
ARS	Male	1.95	0.66	-2.05	0.04
	Female	2.12	0.58		
IRS	Male	1.73	0.83	0.141	0.89
	Female	1.73	1.02		
TLRS	Male	1.80	0.75	-1.33	0.19
	Female	1.93	0.79		
SRS	Male	1.97	0.74	0.15	0.88
	Female	1.73	0.70		
DRS	Male	4.46	0.93	0.53	0.60
	Female	1.40	0.94		
GRS	Male	1.65	0.79	-0.83	0.41
	Female	1.73	0.75		

**Table 5:** ANOVA differential analysis in level of stress among the departments of Faculty of Allied Health Sciences

Stressors	Variables	Sum of squares	Df	Mean square	F	p-value
Level of stress	Between groups	0.98	4	0.24	0.73	0.57
	Within groups	75.59	225	0.33		
<b>Comparison of stressors (sources of stress)</b>						
ARS	Between groups	0.93	4	0.23	0.58	0.67
	Within groups	89.28	225	0.39		
IRS	Between groups	3.12	4	0.78	0.92	0.46
	Within groups	191.96	225	0.85		
TLRS	Between groups	2.01	4	0.50	0.85	0.50
	Within groups	133.04	225	0.59		
SRS	Between groups	3.09	4	0.77	1.52	0.20
	Within groups	113.96	225	0.51		
DRS	Between groups	1.16	4	0.29	0.33	0.86
	Within groups	198.34	225	0.88		
GRS	Between groups	5.16	4	1.29	2.23	0.07
	Within groups	130.14	225	0.58		

Sciences student's level of stress ranges from moderate to high level of stress. This is similar with findings of Sohail which indicated that 71.6% of medical students had moderate stress (12) and similar to the findings of Othman et al. which found out that allied health sciences students experiences moderate to high level of stress (8). However, the result is contrary to the studies of Schafer and Fisher that reported strong (high) relationship between stress and college students (13, 14).

The only stressor domain that scored more than 2.00 was ARS, indicating that it caused high stress to the students. The reason being that, the length of semesters is too short for the students to cover the academic workload and at the same time meet the criteria for promotion to the next level. Whereas, the other five domains; IRS, GARS, TLRS, SRS, and DRS were causing moderate stress to the students. So it clearly suggested that academic requirements contributed substantially to stress level of the students. This result is supported by Fisher who reported that one of the main causes of academic stress is test anxiety (14).

The pre-clinical phase was found out to be more stressful than clinical phase of study. This may be due to the fact that the students are new to the university environment and might not be familiar with new medical terms they are introduced to. This is consistent with the findings of Borjalilu, Mohammadi and Mojtahedzadeh (9) but contrary to Koochaki et al, which found no significant differences in the level of stress among these phases of study (15).

Pre-clinical students experience more stress in IRS (this may be due to the fact that the students are new to one another as such may not entertain the mistakes of one another which may result into physical or emotional abuse) and DRS (this may due to the fact most of the student in Faculty of Allied Health Sciences did not choose the programmes they are now and as such during their pre-clinical phase; they do not know much about the programmes as such become distressed, but when they move to the clinical phase and found out more about the programmes they tend to be satisfied) but there was no significance differences in ARS, SRS, TLRS and DRS.

This study found no significant difference in the level of male and female students stress which is similar to findings of Niemi and Vainiomäki (16) and Firth (17), but contrary to other studies such as Abu-Helalah et al. (18), Yusoff and Abdul Rahim (10). However, the female student's experiences more academic stress than their male counterpart and this is consistent with other studies, Abu-Helalah et al. (18), and Yusoff and Abdul Rahim (10). But there was no significance differences in all other domains. This may be as a result of male constituting most of the participants.

This study found no significant difference in the level of stress among the various departments of Faculty of Allied Health Sciences which is inconsistent with a study by Omigbodun et al. (19). There was also no significant difference across all domains of MSSQ among the departments of Faculty of Allied Health Sciences.

## LIMITATIONS

The study was conducted only in one university, Bayero University Kano and as such generalising to the whole Nigerian allied health students should be done with care. Furthermore, the study was carried out using a structured questionnaire developed elsewhere as such the study may not explore some stressors specific to the setting.

## CONCLUSION AND RECOMMENDATION

This study found out that the allied health sciences students experienced moderate to high level of stress. The highest stressor was academic stress. Therefore, emphasis should be put in increasing the length of semesters or revising the criteria for promotion to the next level. This will ensure that our curriculum and other activities set for allied health sciences students are in the range of their coping limit. This will avoid any acute or chronic stress which eventually will affect

their academic performance and later their work performance in life. The allied health sciences curriculum should be developed with the consideration of all domains that contribute to the stress especially those that are academic related stressor.

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