

## Evaluating Stress in Undergraduate Allied Health Science Students at a University in Ghana

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### Abstract

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**Background:** High sources of stress have been reported in health-care students. Professional education can be a stressful experience for some individuals, and may impact negatively on emotional well-being and academic performance. However, there is a dearth of literature in Ghana concerning this field. This study set out to assess the sources and levels of stress faced by undergraduate allied health science students at University of Ghana in Ghana

**Methodology:** We set out to carry out a cross sectional study at the School of Biomedical and Allied Health Sciences, and our sample included 304 Allied Health Science students. The Undergraduate Sources of Stress questionnaire was administered to Allied Health students in all years of available undergraduate courses of the School. Data was analyzed using SPSS version 20.0 utilizing Mann-Whitney U and Kruskal-Wallis test.

**Results:** Academic concerns were rated the highest stress level for all students, particularly the amount of material to learn ( $2.80 \pm 1.14$ ), time demands ( $2.71 \pm 1.15$ ) and overall stress ( $2.70 \pm 1.10$ ). Stress levels between the various departments varied significantly ( $P=0.011$ ), whereas the stress levels varied insignificantly between levels of training ( $P=0.856$ ) and between male and female students ( $P=0.725$ ).

**Conclusion:** The study revealed academic concerns including the amount of material to learn, time demands of the course as well as financial issues as the greatest stressors among students. The findings of this study emphasize the need to organize stress management seminars or workshops upon admission into the respective programmes.

**Keywords:** *Stress level, academic concerns, sources of stress, academic stress, stressor*

## Introduction

Stress in academic institutions can have both positive and negative consequences if not well managed [1, 2, 3] and stress poses a great threat to the quality of life for students [4, 5]. High stress levels impair students' academic achievement as well as personal and professional development [6]. College students, especially those in the first year, are a group particularly prone to stress [7, 8] due to the transitional nature of college life [9]. They must adjust to being away from home for the first time, maintain a high level of academic achievement, and adjust to a new social environment. These stressors do not cause anxiety or tension by themselves. Instead, stress results from the interaction between stressors and the individual's perception and reaction to those stressors [10]. The amount of stress experienced may be influenced by the individual's ability to effectively cope with stressful events and situations [8]. If stress is not dealt with effectively, feelings of loneliness and nervousness, as well as sleeplessness and excessive worrying may result [11].

The pressure to earn good grades and to achieve a degree is very high [12]. Earning high grades is not the only source of stress for college students. Other potential sources of stress include excessive homework, unclear assignments, and uncomfortable classrooms [13]. In addition to academic requirements, relations with faculty members and time pressures are factors that need considering [14]. Relationships with family and friends, eating and sleeping habits, and loneliness may adversely affect some students [11]. College students experience high stress at predictable times each semester due to academic commitments, financial pressures, and lack of time management skills. When stress is perceived negatively or becomes excessive, it can affect both health and academic performance [15]. University students often attempt to control and reduce their stress through avoidance, religious and social support, or positive reappraisal [16, 17]. Leisure satisfaction and fitness activities act as stress buffers, providing a sense of purpose and competence for college students [18]. Student academic stress is also reduced and controlled through effective time management and study

techniques [19].

A study conducted at the Agha Khan University, Pakistan reported that more than 90% of students felt stressed at one time or the other during their course [20]. In the University of Botswana, it was found out that, academic workload, inadequate resources, low motivation, and poor performance in academic, continuous poor performance in academic, overcrowded lecture halls, and uncertainty of getting job after graduating from the university lead to stress among students [21]. Saipanish reported that 61.4% of students in a Thai Medical School had experienced some degree of stress [22]. In a study conducted by the University of Minnesota's Boynton Health Service 9,931 students at 14 different two- and four-year schools were surveyed. Results showed that 69.9% reported they were stressed and 32.9% said that stress was hurting their academic performance. The students who reported high levels of stress obtained a grade point average (GPA) of 2.7 while the students that reported no significant stress levels obtained a GPA of 3.3 out of a maximum score of four (4.0).

In Ghana there is paucity of information on the stress levels of students and the main causes of stress in the health professions. Thus, this study aimed to assess the sources and levels of stress faced by students to guide the necessary authorities in the development of programmes or interventions to tackle these issues.

## Materials and Methods

The study was a cross-sectional study that involved 304 allied health students at the School of Biomedical and Allied Health Sciences in the University of Ghana.

A questionnaire consisting of 2 sections, Section A and Section B, was used. Section A, a data capturing form consisted of questions used to obtain respondents' demographic data. Section B, the Undergraduate Sources of Stress Questionnaire (USOSQ) developed by (Blackmore et al.) [23], is an 18-item questionnaire categorized under 3 areas: Financial, Personal and Academic. It used a Likert scale ranging from zero to 4 with zero representing "Not at all", 1 representing "A little", 2 representing "Somewhat", 3 representing "Quite a bit", and 4 representing

“A great deal”.

Students were briefed on the research topic and requested to complete the self-administered questionnaire which took approximately 10 minutes. The researchers retrieved copies of the questionnaire from the students after completion.

## Data analysis

Data were entered into a database and analysed statistically using the SPSS version 20.0. Descriptive statistics of percentages, mean and standard deviation were used to summarize the socio-demographic data, sources of stress and the levels of stress. The Wilcoxon sum-rank test (Mann-Whitney U test) was used to test for differences in stress levels between male and female undergraduate students in the School. The Kruskal-Wallis test was used to compare the stress levels between the undergraduate students in the 4 available departments (Medical Laboratory Sciences, Physiotherapy, Radiography and Dietetics) in the School that participated in the study. The Kruskal-Wallis test was also used to compare the stress levels between the students at various levels of training.

## Results

This study sought to assess the sources and levels of stress among undergraduate allied health students of the School of Biomedical and Allied Health Sciences who volunteered to take part in the study. The return rate of the questionnaire was 81.3% (304 out of a possible 374 students) with 57.2% of participants being males while 42.8% were females. The participants consisted of 135(44.4%) students from Medical Laboratory Sciences, 81(26.6%) from Physiotherapy, 60 (19.7%) from Radiography, and 28(9.2%) from Dietetics. Table 1 shows the age distribution of participants by department and Table 2 shows the gender distribution.

Table 1: Descriptive statistics for subject demographics by age group and department

Age Group	Physiotherapy N(%)	Radiography N(%)	Med. Sci. N(%)	Lab. Dietetics N(%)	Total N(%)
18-21	31(38.3%)	23(38.3%)	37(27.4%)	17(60.7%)	108(35.5%)
22-25	46(56.8%)	31(51.7%)	71(52.6%)	11(39.3%)	159(52.3%)
26-29	3(3.7%)	3(5%)	17(12.6%)	0(0%)	23(7.6%)
≥30	1(1.2%)	3(5%)	10(7.4%)	0(0%)	14(4.6%)
<b>Total</b>	<b>81(26.6%)</b>	<b>60(19.7%)</b>	<b>135(44.4%)</b>	<b>28(9.2%)</b>	<b>304</b>

Key: Med. Lab. Sci. = Medical Laboratory Sciences

Table 2: Descriptive statistics for participants' demographics by department and sex

Department	Males N(%)	Females N(%)	Total N(%)
Physiotherapy	41(51.6%)	40(48.4%)	81
Radiography	34(56.7%)	26(45.3%)	60
Med. Lab. Sci	85(63%)	50(37%)	135
Dietetics	14(50%)	14(50%)	28
<b>Total</b>	<b>174(57.2%)</b>	<b>130(42.8%)</b>	<b>304</b>

Table 3 shows the sources of stress scores for each subcategory. The total mean scores showed that academic had the highest stress level  $3.19 \pm 0.76$  among the other sub scale groups. Amount of material to be learnt in the course was the highest source of stress (2.80), followed by time demands (2.71), physical demands (2.46) and stress full events (2.35) of the course. The rest were almost equal in their stress scores. There was no significant difference ( $p > 0.05$ ) in the mean rank stress levels of male students compared to female students though males scored a higher mean rank score. The male students recorded higher stress levels. These results are summarized in Table 4.

Table 3: Sources of Stress mean scores obtained from the participants.

Source		Mean	Std. Dev
Financial		<b>2.76</b>	<b>0.98</b>
	Personal Finances	1.79	1.30
	Accommodation	1.61	1.35
	Transport	1.67	1.35
	Cost of Books Equipment	1.85	1.25
	University Fees	1.88	1.44
Personal		<b>2.58</b>	<b>1.02</b>
	Relationship with Family Members	1.24	1.33
	Relationship with Partner	1.13	1.31
	Loneliness	1.37	1.29
	Physical Health	1.56	2.78
	Psychological Health	1.53	1.30
	Stressful Events	2.35	1.17
	Mood	1.87	1.21
Academic		<b>3.19</b>	<b>0.76</b>
	Intellectual Demands of The Course	2.38	1.21
	Physical Demands of The Course	2.46	1.17
	Time Demands of The Course	2.71	1.15
	Uncertainty About Expectations in The Course	2.31	1.19
	Amount of Material to Be Learnt in The Course	2.80	1.14
	Overall Level of Stress	2.70	1.10

Table 4: Difference in stress levels between male and female students.

Gender	N	Mean Rank	Sum of Ranks	Z	P-value
Male	174	153.97	26791.5		
Female	130	150.53	19568.5	-0.351	0.725
Total	304				

There was no significant difference ( $p > 0.05$ ) in the mean rank stress scores though student level scored the highest mean rank score followed by Level 300 and Level 200. These results are summarized in Table 5.

Table 5: Difference between stresses identified by students at different levels

Level	N	Mean Rank	X <sup>2</sup>	P-value
200	100	149.06		
300	108	152.76	0.321	0.856
400	96	155.78		
Total	304			

There was a significant difference ( $p < 0.05$ ) in the mean rank stress scores between the departments. Medical Laboratory Sciences ranked the highest, followed by Dietetics, Physiotherapy and Radiography. These results are summarized in Table 6.

Table 6: Difference between stress levels of students in the School of Allied Health Sciences departments.

Department	N	Mean Rank	X <sup>2</sup>	P-value
Physiotherapy	81	146.88		
Radiography	60	124.39		
Med. Lab	135	167.35	11.22	0.011
Dietetics	28	157.39		
Total	304			

Key: Med. Lab. Sci. = Medical Laboratory Sciences

## Discussion

The results of this study identified academic stress as that the greatest stressor experienced by Allied Health Sciences students, followed by financial stress and personal matters. The highest stress levels recorded were from the amount of material to be learnt in the course. Earlier studies [24, 25] also reported academic stress as the greatest stressor in physiotherapy students. Similarly, a study by Mandy et al, [26], involving podiatry students in the United Kingdom and Australia, showed that academic stress was the greatest stressor. Not many studies have been conducted comparing students in different courses to test for differences in stress levels. In this study Medical Laboratory Sciences students appeared to experience the greatest stress levels followed by Dietetics, Physiotherapy and Radiography students of which there was significant differences between the different departments. The curriculum for levels 200 and 300 of the Medical Laboratory Sciences appears to be more robust compared to the other courses thus it is expected that the students would record higher stress values as compared to their peers. As no definitive reason for the differences can be stated the assumption was made that class size may contribute to student stress. Interestingly, the Medical Laboratory Sciences Department admits more students per year as compared to the other departments, which seems to support our assumption.

Gorter et al. [27] measured the differences in stress levels between fifth year dental students and their stress levels in their first year in dentistry and revealed that the levels recorded in their fifth year was higher than in their first year. This study showed no significant differences in stress levels between students of the various levels which

corroborates results of previous studies by Abdulghani, [28], and Marjani [29].

The results showed no significant difference in the stress levels between male and female students of the School. Very few studies have found differences in stress between male and female students although a study by Dahlin et al, [30], involving medical students in the Karolinska Institute Medical University, Stockholm, Sweden, showed that females recorded higher stress levels than males. Stroud et al [31] found a difference in sources of stress between males and females but no conclusions were made on the levels of stress. Females were found to be more prone to stress associated with social rejection and males more prone to stress from achievement challenges.

Brougham et al [32] also found stress to be higher in females than in males. It might seem females are more stressed due to the fact that they carry more physiological burdens. A similar study assessing stress among university students showed that female students had more stress than males and thus was explained as the fact that females are more subjected to the community pressure and adherence to cultural habits and demands [9]. This is in accordance with the studies carried out by Dyrbe indicating higher stress in the female medical students in Canada and United States [33, 34,35]. This finding is also in agreement with the study from Pakistan by Khan et al. showing higher stress in female students [20]. The perception of a greater level of stress by female students in a study could not be attributed to a single source [8].

This study indicated that the main source of stress experienced by Allied Health students of the School of Biomedical and Allied Health Sciences were related to academic factors, especially the amount of materials to be learnt in the course, with personal factors, particularly relationships with partners, having the least impact on stress. This finding is corroborated by a study done in the University of Botswana, where relationship with girl or boyfriend, family life and fear of getting a job had the least impact on stress [15]. Furthermore, in an exploratory study to determine the sources and support among university students, relationships with parents and friends were viewed as most supportive and thus helped relieve stress [2]. The study also revealed that there were significant differences in stress levels between students in the departments in

the School of Biomedical and Allied Health Sciences.

One strategy to reduce students' stress could be to increase the course duration by a year as this would also reduce the student workload each academic year. However, this might also increase the financial factors that cause students' stress. In addition, recreational activities could be organized, and students encouraged to participate during their course as a means of stress management. Students may however benefit from the provision of stress management seminars or workshops to assist them to recognize and manage their stress during their professional education.

## Conclusion

This study revealed that the main sources of stress suffered by Allied Health Sciences students were from academic factors, especially the amount of materials that need to be learnt in the programme. The study also revealed that there were significant differences in descending order (Medical Laboratory Sciences, Dietetics, Physiotherapy and Radiograph) for stress levels among students in the various departments of the School.

Students upon admission could be educated on stress and its management through University organized seminars or workshops as well as periodic recreational activities as a means of stress management. A longitudinal study could be conducted to assess the stress levels among students throughout the period of pursuing the programme.

## Declarations

All students who were willing to participate in the study signed a written consent form. The researchers distributed the questionnaire to each class during break periods or immediately after a lecture period. The researchers then briefed the class on the research topic and the students completed the questionnaire with minimal assistance. Copies of the questionnaire were collected from the students as they completed them. It takes about 10 minutes to complete the questionnaire.

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**Author contributions**

GN, AY and JQ contributed to the study design, collected and analysed the data. JQ and SK sourced and reviewed relevant literature. GN, AY, JQ and SK wrote and also reviewed the manuscript for important intellectual content. GN, AY, JQ and SK revised the final draft version and approved the final version of the manuscript for submission.

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