

AN INVESTIGATION INTO THE RELATIONSHIP BETWEEN STRESS AND THE ACADEMIC ACHIEVEMENT OF BIOLOGY STUDENTS IN NIGERIAN UNIVERSITIES (A CASE STUDY OF TAI SOLARIN UNIVERSITY OF EDUCATION, JAGUN, IJEBU-ODE OGUN STATE).

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ABSTRACT

This study aimed at examining the type of relationship that exists between physiological stress and the academic achievement of biology students in Nigerian universities. A stress scale was used to assess the amount of stress perceived by each respondent in a semester and their Grade Point Average in that same semester was used to measure their academic achievement. Correlation computation between the stress scale score and the Grade Point Average revealed that the amount of stress the surveyed students perceived was not significantly correlated with their Grade point average. $r = -.088$. The study also aimed at determining the ten major sources of stress for biology students. A list of twenty sources of stress was presented before the respondents and they were asked to choose which sources of stress had impacted negatively on their Grade Point Average in the said semester. It was discovered that biology students perceive more stress from their academics with inadequate laboratory facilities ranking the highest source of stress, closely followed by heavy academic workload,; few practical classes; boring practical classes; not getting enough sleep; unclear assignments; duality of responsibility; finance; class attendance and lastly examination anxiety. It was concluded that although biology students experience stress from time to time, effective stress management technique and coping strategies is the key to reducing its impact on their academic performance. Furthermore, the university management should also orientate the teaching staffs in Biology Department on the importance of providing a conducive learning environment for the students, thereby reducing the amount of stress they perceive from their academics.

Key words: stress, biology students, academic achievement, Nigerian Universities

INTRODUCTION

Stress is a part of the normal fabrics of human existence. Every individual regardless of race or cultural background, social and occupational status and even children experience stress in many ways (Oyerinde, 2004)¹. It is an inevitable part of challenges that prompt mastery of new skills and behaviour pattern. However, when stress becomes excessive, difficulties occur and the sufferer experiences disrupted emotional, cognitive and physiological functioning. Chronic stress is also associated with the development of physical illness including such leading causes

of death. Two of such diseases are heart diseases and high blood pressure among many. The cost of stress in terms of human suffering, social and occupational impairment and mental illness is enormous (Crider, Goethal, Kavanaugh and Solomon, 1983)².

Selye (cited in Crider *et.al*, 1983) defines stress as the body's general response to environmental situation, which can lead to change in physical, emotional, behavioural or mental state. Stress according to Meeks-Mitchell and Heit (cited in Oyerinde, 2004) is the non-specific response of the body to any demand made upon it. It is the biological response to events that threatens to overwhelm an individual's capacity to cope satisfactory in the environment. Dunkel-schetter and Lobel (1990)³ asserts that physiological stress is any particular relationship between a person and the environment that the person judges to be beyond his or her resources and jeopardizes his or her well being.

Over the years, researchers in the education field have since discovered that student poor performance in academic work can be attributed to chronic stress. Wombie (2005)⁴ conducted a survey to show the impact of stress on college students' academic performance. According to her, college students have many obstacles to overcome in order to achieve their optimal academic performance and these obstacles are referred to as academic situational constraints. These obstacles are stressors, such as financial constraints or problems, social activities; time management, relations with faculty members, relationships with family, friends, nutritional routines, loneliness. Others are sleeping patterns, social activities, problems with boyfriends or girlfriend, poor class attendance and part time jobs. Having children also pose their own threat to a student's academic performance (Wombie, 2005).

Taylor and Owusi-Banahana (2010)⁵ who conducted a study on stress among part- time business students, and Schroeder (2002)⁶ concluded that stress had a negative effect on the academic achievement of college students

Biology is a broad subject with many other subjects like zoology and botany among many others as its branches. The successful study of this course at the tertiary level therefore requires a focused, disciplined and dedicated student. However, these qualities can be affected by the level of stress individual student's experience. Biology students not only experience stress from stressors stated above but others arising from the complex nature of the subject itself. Such stressors may include laboratory/practical work, inadequate instructional materials, competition for the little available laboratory equipment among others.

The inability of biology students to effectively manage these stressors have resulted in their poor academic achievement and ultimately in the production of ill-equipped biology graduates, who often fail to perform as expected in post University years, either as teachers or in other chosen field. It is therefore important that stressors affecting the academic achievement of biology students in Nigerian universities be identified and the relationship between stress and the academic achievement of biology students be determined with the aim of providing practical solutions to its overall effect on their academic achievement so as to save the country from a degenerating educational sector especially in the production of skilled biology teachers.

PURPOSE OF THE RESEARCH

The purpose of this research is to:

1. Establish that biology student in Nigerian tertiary institutions experience stress on a regular basis regardless of their various levels.
2. Establish that stress has an effect on biology's student's academic performance.
3. Determine the various sources of stress affecting biology students.

RESEARCH HYPOTHESIS

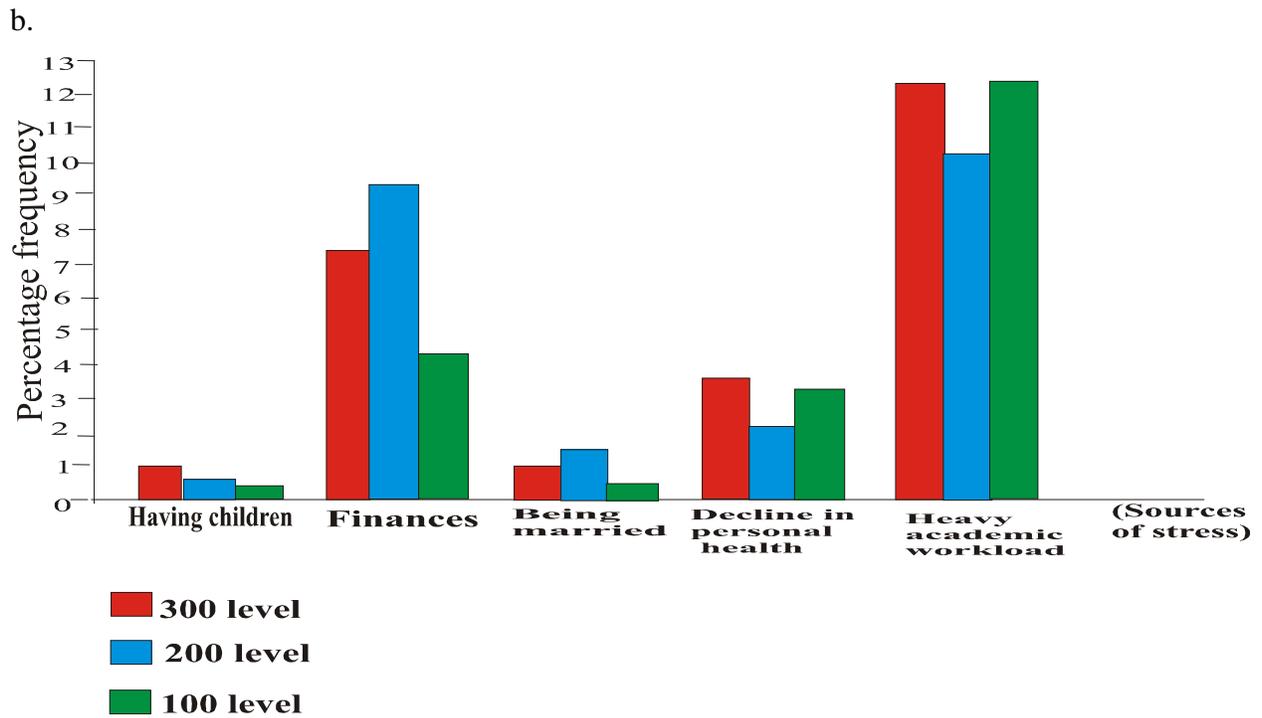
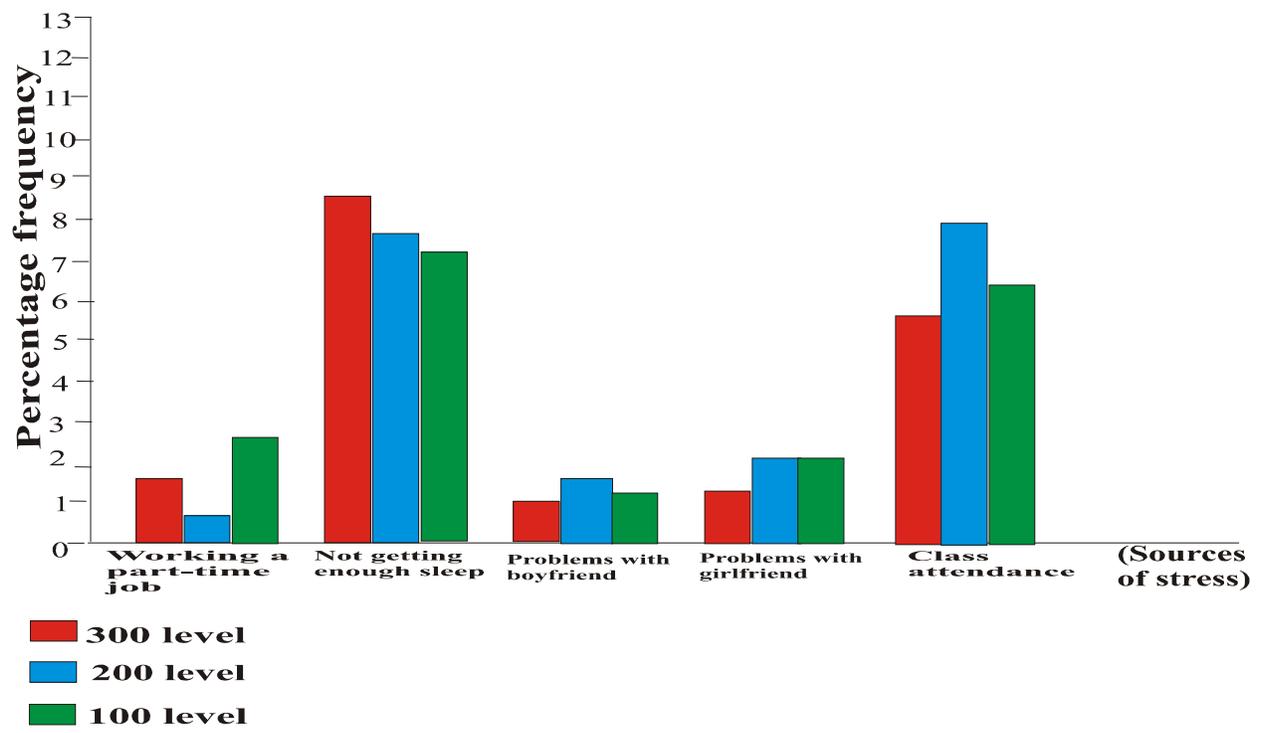
1. There is no significant relationship between the amount of stress perceived by individual biology students and their academic achievement in a particular semester.
2. There is no significant different in the amount of stress experienced by individual biology students in a particular semester.

METHOD

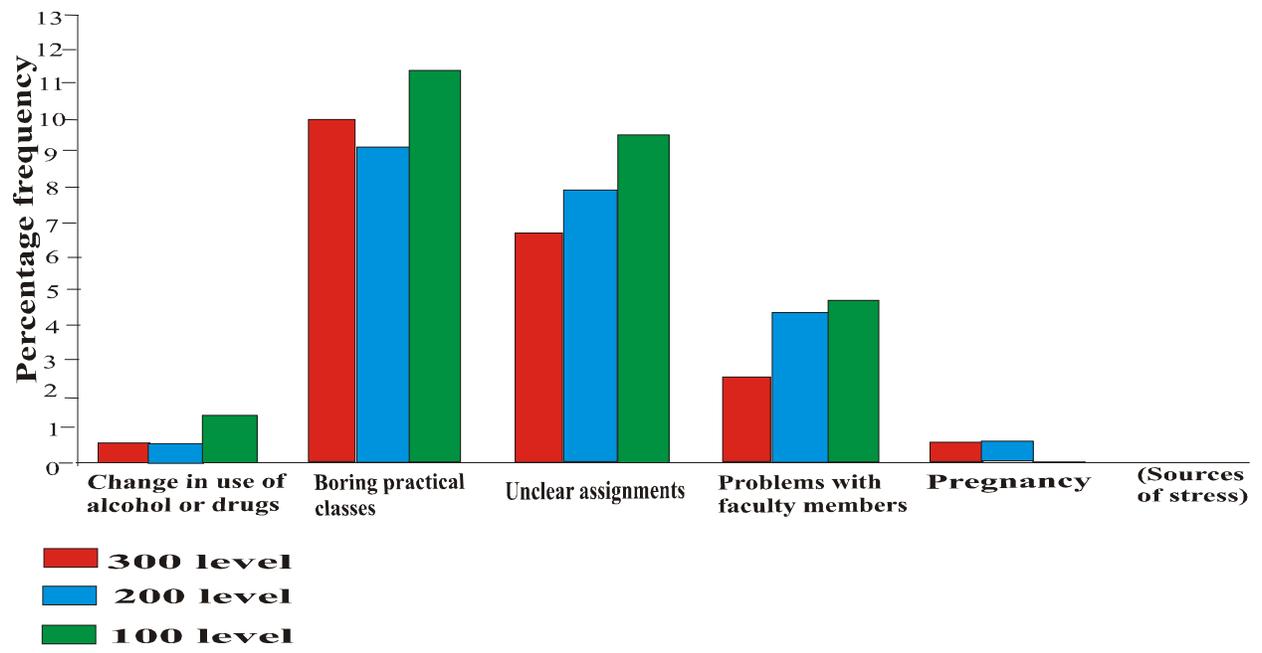
The research design employed was the descriptive research type in which quantitative and data was used and the category of the design is the case study. The population used for this study used was Nigerian University students. The sample consisted of 164 biology undergraduates from Tai Solarin University of Education, Ijagun, Ogun State. The research instrument used for gathering data was questionnaire. It was divided into three sections. The first section which contained items that measured the amount of stress perceived by individual biology students in a particular semester is a modification of the Perceived Stress Scale developed by Cohen and Mermeisten in 1983 (cited in Wombie 2005). The second section contained questions pertaining to students' grade point average. This was used to measure students' academic achievement in the same semester and the third section contained a list of possible sources of stress for biology students to determine the various sources of stress. The data generated for this study was presented using graphs such as bar charts; frequency polygon and histogram to show the difference in the response of biology students to the various sources of stress. The data was analyzed using the spearman's Rank order correlation coefficient and analysis of variance (ANOVA). The former showed the type of relationship that exists between the amount of stress perceived by biology students and their grade point averages in a particular semester. Analysis of variance was used to determine the difference in the amount of stress experienced by individual biology students in a particular semester.

RESULTS

Figure 1a: - The histograms 1a, b, c and d below show the difference in percentage frequency of each sources of stress in the various levels. They gives the difference in the percentage of respondents who chose the various sources of stress as factors that contributed to their Grade Point Averages in the stipulated semester.



c.



d

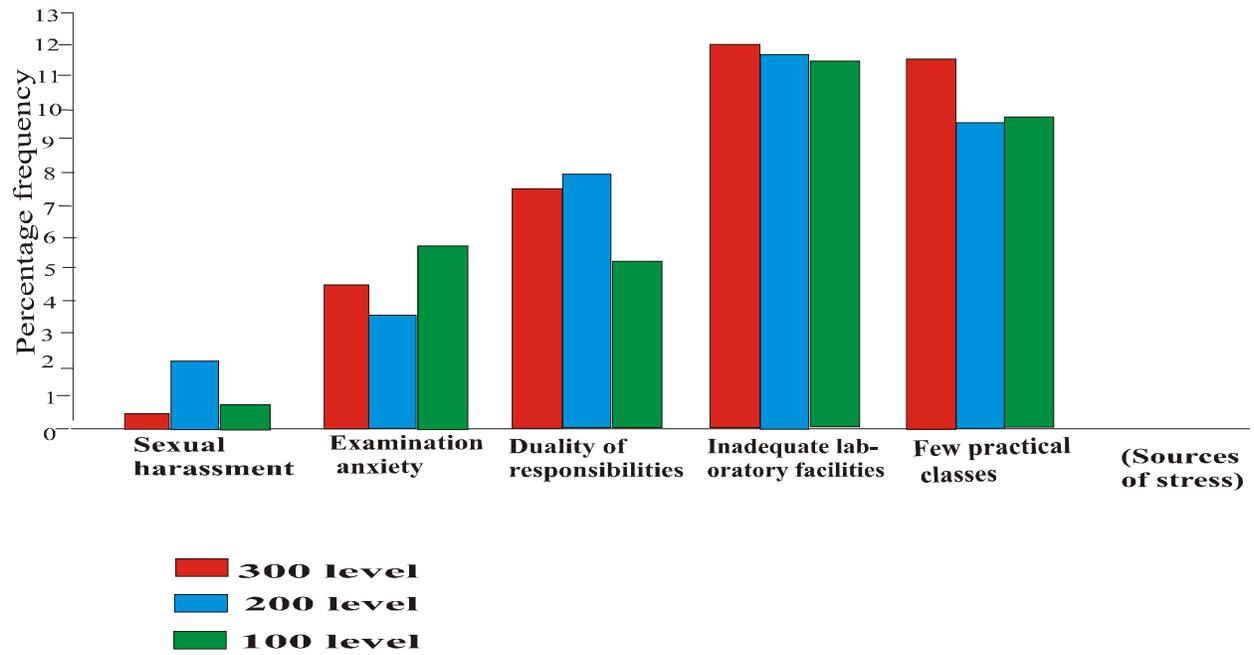
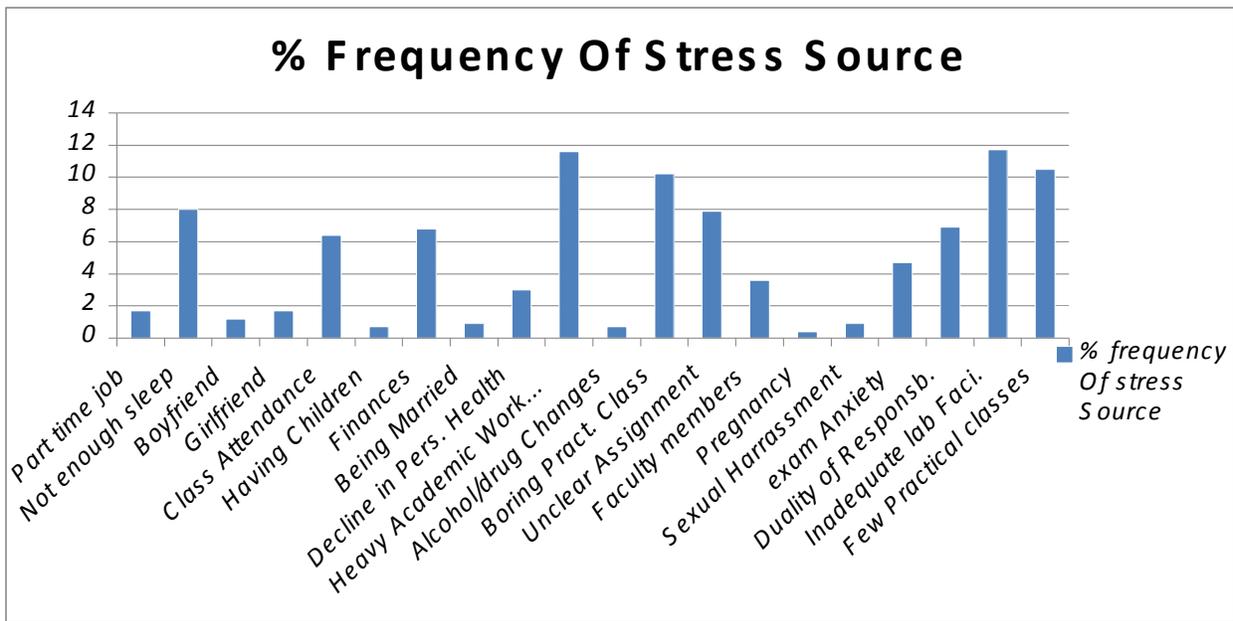
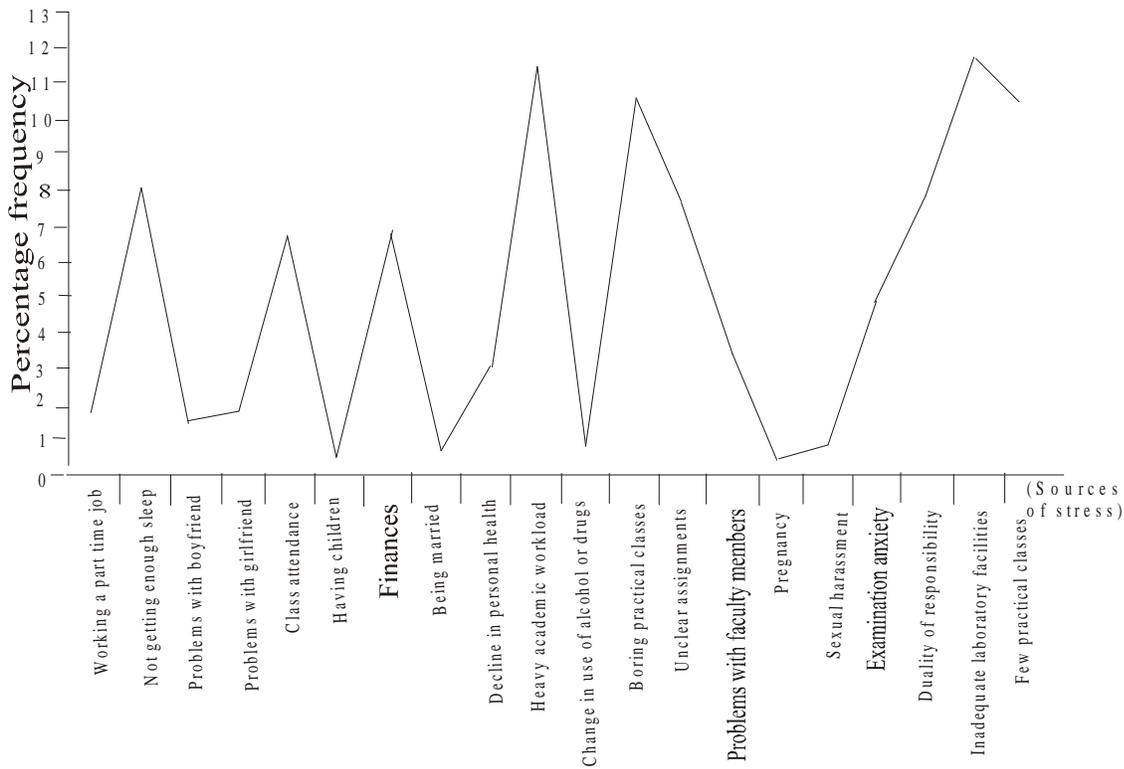


Figure 2: - The graph above 2a and 2b show the sources of stress that respondents perceived to have had the highest and least impact on their Grade Point Average (all levels combined)

a. Bar chart



b. Frequency polygon



Testing for hypothesis 1

H₀: There is no significant relationship between the amount of stress perceived by individual biology students and their academic achievement in a particular semester.

Table 4: Spearman's Rank correlation co-efficient showing the relationship between stress (stress scale) and Grade Point Average (G.P.A).

| | Stress scale | G.P.A | Sources of stress | Level |
|-------------------|--------------|--------------|-------------------|-------|
| Stress test | 1.000 | -.088 | .316 | .053 |
| G.P.A | -.088 | 1.000 | .092 | .221 |
| Sources of stress | .316 | .092 | 1.000 | .084 |
| Level | .053 | .221 | .084 | 1.000 |

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

From the above table, $r = -.088$; correlation thus is not significant

Testing for hypothesis 2:

Ho: There is no significant difference in the amount of stress perceived by individual biology students in a particular semester.

Table 5: Shows the different in the amount of stress perceived by individual biology students in a semester.

a) Analysis of variance (ANOVA) using the various sources of stress

| Sources of variation | d.f (m.v) | s.s | m.s | v.r | F. pr | Remark |
|----------------------|-----------|---------|-------|------|-------|---------|
| Level | 2 | 478.5 | 239.5 | 0.95 | 0.389 | No sig. |
| Residual | 153 (7) | 38493.6 | 251.6 | | | |
| Total | 153 (7) | 38947.6 | | | | |

Level of significance at $P (0.389) > 0.05$. Thus, there is no significant difference.

b) Analysis of variance (ANOVA) using the stress scale score

| Sources of variation | d.f (m.v) | s.s | m.s | v.r | F. pr | Remark |
|----------------------|-----------|---------|-------|------|-------|---------|
| Level | 2 | 127.44 | 63.72 | 1.27 | 0.285 | No sig. |
| Residual | 160 | 8048.96 | 50.31 | | | |
| Total | 162 | 8176.40 | | | | |

Level of significance at $P (0.285) > 0.05$. Therefore, there is no significant difference.

DISCUSSION

Hypothesis 1: -

Ho – There is no significant relationship between the amount of stress perceived by individual biology students and their academic achievement in a particular semester.

The correlation of respondents scores on the stress scale with their Grade point average (Table 4) shows that there is no relationship between amount of stress perceived by biology students and their Grade point average, thus the null hypothesis (Ho) is accepted. The result of the correlation computation contrasts with the findings of Shroeder (2002) that a negative relationship exists between stress and students Grade

Point Average in a semester and agrees with Wombie (2005) in concluding that students' academic achievement is independent of the amount of stress they perceive in a semester.

This relationship is explained by an array of scores that does not depict the dependent relationship of students Grade Point Average on the amount of stress they perceived. At a glance, one can easily say that a student with low scores on their stress scale column has a high Grade point average and vice-versa. If this arrangement of scores on both columns is consistent, then it would be right to conclude that biology students' academic achievement is dependent on the amount of stress they perceive. However, at a closer examination, it becomes glaring that the distribution of scores does not show such consistent arrangement as a wide variation of scores occur with low scores on the stress scale column and high grade point average and vice-versa.

The Yerkes Dodson law (1908)⁷ explains why some students have low scores on both columns and others have a high score on the stress scale and a low Grade Point Average. The law simply states that students or individuals under low and high stress learn the least while those experiencing moderate amount of stress learn the most. This statement supports Wombie (2005) opinion that while individual stressors might not impact on students' performance, a cluster of stressful stress factors would definitely alter the ability of sufferers' optimum performance unless an effective coping strategy is developed. However, it is quite impossible to neglect the impact biased answering of the questionnaires might have had on the results of this study. This can be seen in some of the responses on both columns. These responses contradict the Yerkes-Dodson law. The fact that some students found it difficult to refer to their thoughts and feelings may have affected their scores on the stress scale, thus explaining why some respondents have extremely low scores on the stress scale and a high Grade Point Average. Most students did not fill the questionnaire correctly despite the instructions attached to each section. Moreover, some students did not remember all the courses they registered for in the second semester of the 2008/2009 academic session and the grades they obtained in each course and the willingness of the students to fill the questionnaires resulted in the small population used for this study were limitations that may have contributed in its results.

Hypothesis 2:

Ho- There is no significant differences in the amount of stress perceived by individual biology students in a particular semester.

The results from table 5a and b show that there is no significant difference in the amount of stress perceived by individual biology students in a particular semester. Thus, the null hypothesis (Ho) is accepted although according to Oyerinde (2004), Wombie (2005), students do not experience stress from the same source because the same situation is not evocative or stressful for all students. However, the way the student perceives his/her stress can actually determine how much stress the student is actually under.

It can therefore be concluded that regardless of the differences in the various sources of stress biology students experience, there is no significance difference in the amount of stress the actually perceive.

Sources of Stress for Biology Students

The data examined to determine the sources of stress for biology students showed that biology students perceive the highest amount of stress from their academics. Inadequate laboratory facilities had the highest total percentage of response of 11.7% and was ranked number one source of stress. The percentage response shows that students believed it to have impacted immensely on their Grade Point Average, thus agreeing with Ajewole (cited in Olugbebi 2005)⁸, Hallark (1990)⁹, that inadequate educational resources such as laboratory equipments contributes to the poor performance of biology students. Thus for effective teaching and learning, well equipped laboratories are needed, the lack of which can be concluded to be a major source of stress for biology students in Nigerian universities.

Heavy academic workload was ranked the second major sources of stress that biology students believed to have impacted on their Grade Point Average. It had a total percentage response of 11.6%. This findings is in support with that of Ross *et.al* (1999)¹⁰, Phinney *et.al* (2003)¹¹, Ogundipe (2005)¹², and Taylor *et.al* (2010) assertion that heavy academic workload is a great source of stress for college students and contradicts with Szafran (2004)¹³ and Wombie (2005) opinions that heavy academic might not necessarily impact on students academic performance.

Few practical classes had a total response 10.5% and was ranked by biology students as the third major source of stress that had significant impact on their Grade Point Average thereby agreeing with Nwanwo and Ekpeke (1982)¹⁴, Awe (cited in Olugbebi (2005), that exposure of students to practical classes can indeed impact positively on their Grade Point Average. Thus lack of adequate practical classes can also be listed as a major source of stress for biology students since it affects their retention ability during assessment periods and does not help both the lecturer and the students to attain educational objectives which are to train minds for research, investigation, discussion; objectivity and intellectual adventure and according to Ebosoye (1990)¹⁵ thirst for knowledge, critical reason and sober judgment which are qualities commonly associated with the truly educated.

Boring practical classes ranked fourth source of stress that biology students claimed to have impacted negatively on their Grade Point Average. It had total response of 10.2%. This might be as a result of many factors one of which is inadequate laboratory facilities, the reverse of which Sikirullah (2005)¹⁶ opined to have a motivating effect on the learning capacity of students. Another factor is large number of students using the laboratory at once and according to Sikirullah (2005) makes it difficult for lecturers/teachers to communicate effectively with the students. Others are the lukewarm attitude of some lecturers to practical classes and the inability of the teacher to create a conducive learning environment for the students. Therefore, boring practical classes might be listed as a major source of stress for biology students.

Not getting enough sleep had a total response of 8.0% and was ranked by biology students as their fifth major source of stress; thus agreeing with the assertions of Wombie (2005), Kelly *et al* (2001)¹⁷ and Taylor *et al* (2010) that sleep impacts significantly on a students Grade Point Average. This finding also concurs with Ross *et al* (1999) that changes in sleeping habit is a constant source of stress for students. This may be as result of students staying up late to study.

Biology students also ranked unclear assignments as the sixth source of stress that had impacted negatively on their Grade Point Average. It had a total response of 7.9%. This finding concurs with Kohn &

Frazer (1986)¹⁸ assertion that unclear assignment is a major source of stress for students. Unclear assignment might not only be the source of stress in this area, trying to meet up with assignment and project deadline and having too many assignments to submit at the same time which is a very frequent occurrence in the university used for this study from the point of view of this researcher is also a major source of stress for biology students. Also group assignments can be a constant source of stress if the other students are not cooperating.

Duality of responsibilities was ranked the seventh source of stress that biology students claimed to have impacted negatively on their grade point average. It had a total percentage response of 6.9%, thus corresponding with findings of Taylor *et al* (2010) that duality of responsibility is a major source of stress for college students more especially students working part-time or full time jobs and Phinney *et al* (2003) report that domestic responsibilities, not necessarily family issues are a major source of stress for ethnic minority first generation college freshman; Ross *et al* (1999) assertion that new responsibilities coupled with academic requirement can be a major source of stress for students. This is explained by the fact that new/duality of responsibility increases students' responsibilities and encroaches on the time such students devote to studying.

Another source of stress biology students claimed to have impacted on their Grade Point Average is finance. It was ranked the eight major source of stress and had a total percentage response of 6.8% thereby corresponding with Ogundipe (2005), Dunkel-schetter *et al* (1990), and Phinney *et al* (2003) assertion that financial difficulties or financial stability is a common source of stress for students it also corresponds with Taylor *et al* (2010) findings that financial difficulties is one of the five most common sources of stress for students working part-time or full-time jobs. This finding also supports Wombie (2005) report that financial obligation can somehow take away from the ability of students to perform their best ultimately impacting on their grade point average

Class attendance had a total percentage response of 6.4% and was ranked as the ninth major sources of stress by biology students. This might be attributed to the fact that many lecturers use it as one of the requirements for passing their courses thereby making it a criteria for students overall Grade Point Average. This discovery supports the findings of the assertion of Wombie (2005) that class attendance is a significant source of stress for college students. Class attendance therefore is not only a source of stress for students with part-time or full-time job as claimed by Taylor *et al* (2010) but for all students regardless of their having either part time or full time jobs. The claim that poor class attendance also impacts on a student's academic achievement further support the findings of Wombie (2005).

Lastly, biology students ranked examination anxiety as their tenth major source of stress. It had a total percentage response of 4.7%. Thus agreeing with Ogundipe (2005) and Taylor *et al* (2010) opinion that examination anxiety or tension is a common source of stress for University college students.

Problems with faculty members (3.6%), sexual harassment (0.9%), having children (0.7%), pregnancy (0.4%), being married were claimed by biology student to have had no significant impact on their academic achievement. However, the implication of this finding cannot be accepted with certainty until the impact of these stressors on the academic achievement of biology students are examined individually.

One finding that is not consistent with prior discoveries is the impact of inter-personal relationships on the academic achievement of students. Biology students claimed that problems with

boyfriend and girlfriend had no impact on their Grad Point Average. These sources of stress had a total response of 1.2% and 1.7% respectively, thus contradicting the findings of Wombie (2005).

Also change in use of alcohol or drugs was claimed by students to have no significant impact on their Grade Point Average. It had a total percentage response of 0.9%, thereby contrasting the findings of Nwaizugbe (2003)¹⁹ and Ogundipe (2005) that changes in use of alcohol and drugs has a significance impact on the academic performance of students.

The percentage responses of the various levels of biology students to the various stress factors show that 100 level students found it difficult to quickly adapt to the University's academic environment. This can be explained by their high response to the various sources of stress in comparison with response of their counterparts in both 200 level and 300 level. Working a part time job had a response of 2.5% from 100 level in comparison with the 1.8% response of 300 level students and 0.5% response of 200 level student; problems with faculty members had a response of 4.7% from 100 level in comparison with the 4.3% response of 200 level and 2.8% response of 300%; change in use of alcohol or drugs had a response of 1.3% from 100 level students in contrast with 0.5% response of students from both 300 level and 200 level respectively. Examination anxiety had a response of 5.9% in comparison with 3.7% and 4.5% of response of students in 200 level and 300 level respectively. Other examples of such contrasts in responses include 9.7% response of 100 level students to unclear assignments which is higher than the 8.0% and 6.8% of responses from 200 and 300 levels respectively. 11.4% response from 100 level students to boring practical classes which is significantly higher than the 10.0% response of 300 level students and 9.1% response of 200 level students in spite of the fact 300 level and 200 level biology students registered for more practical classes than 100 level biology students. The response of 100 level biology students therefore supports Oyerinde (2004) assertion that the weakest stress factor may produce stress in a weak individual (individual here refers to students that find it difficult to develop effective coping strategy) while the strongest stress factor may produce no stress at all in the best equipped individual.

Considering the fact that past studies have considered the effect of some of the discussed sources of stress on students of both sex, it is suggested that the relationship between stress and the academic achievement of biology students of both sex be studied.

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