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Perceived Impact of Stress on the Academic Achievement of Biology Students in Education District IV, Lagos State. Nigeria

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Abstract
A student under stress can become tired, sick and unable to concentrate or think clearly. This study examined the perceived impact of stress on the academic achievements of Biology students in Education District IV of Lagos state. The research design used is the descriptive survey design method. One hundred Biology students were randomly selected using ballot method from four schools in education District IV. Four research questions guided the study. The research instrument used for collecting data is the Stress Assessment Scale for students (SASS). Simple mean method was used to analyze data collected. Some of the findings are that students experience stress most at the end of the term and that students perceive stress as having negative impact on academic achievement. It was recommended that teachers should pace their work adequately in order not to rush students at the end of the term. Also students should be taught stress management skills.
Keywords: Academic achievement; Biology students; Perceived impact; Stress.

Introduction

Academic achievement is the level of performance in school subjects as exhibited by an individual. It is the outcome of education, the extent to which a student, teacher or institution has achieved their educational goals (Wikipedia, the free encyclopedia, 2011). It is generally regarded as the display of knowledge attained or skills developed in the school subjects. Academic achievement is commonly measured by examination scores or continuous assessment scores, but there is no general agreement on how it is best tested. Usually, students' class work are quantified on the basis of marks which could either be high or low which means that academic achievement could either be good or bad

Several factors can impact on academic either positively or negatively. These factors could either be intellective or non-intellective. Intellective factors refer to intelligent quotient or ability of the individual. Some of the non-intellective factors include level of mastery of foundational learning skills. Such as ability to concentrate, remember, think logically (Edublox, 2011) amount of time spent on watching television (Khamsi, 2007) vision, organizational skills, study habits, peer pressure, passion (Wiki. Answers, 2011) exercise, nutritional skills (Hammer, Grigsby and woods, 1998). Stress has also been identified as a factor that can have an impact on a student's academic performance.

Stress is a common element in the life of every individual, regardless of race or cultural background (Garret, 2001). Stress is a part of human nature. Weinberg and Gould (2003) defined stress as a physical, mental or emotional tension. It can be caused by both good and bad experiences. Stress is an ineffective and unhealthy reaction to change. Stress describes a force which affects human beings physically, mentally, emotionally, socially and spiritually. (Akinboye, Akinboye and Adeyemo, 2002), it is the body's response to any undesirable demand. Stress describes physical trauma, strenuous exercise, metabolic disturbances and anxiety, which challenges the body's is homeostasis (well-being). Stress describes the wear and tear that stressors cause in the human body including the distortion of mental and behavioural patterns. Stress also describes how people react to the demands placed on them to causing them worry and also incapacitating their ability to cope. Stress describes the perturbation of the body's homeostasis generating biochemical parameters such as ephinephrine and adrenal cortisols, physiological parameters such as elevated heart rate and blood pressure, behaviuoral characteristics such as anxiety, depression, worry, fear, tension etc. (Akinboye, et al, 2002).

When people feel stressed by something going on around them, their bodies react by releasing adrenaline into the blood. Adrenaline gives people more energy and strength which can be a good thing if their stress is caused by physical danger. But this can also be a bad thing if their stress is in response to something emotional and there is no outlet for this extra energy and strength. The body doesn't distinguish between physical and psychological threats. When an individual is stressed over a busy schedule, an argument with a friend, a traffic jam or mounting bills, the body reacts just as strongly as if the individual was facing a life or death situation. If an individual has a lot of responsibilities and worries, his emergency stress response may be "on" most of the time (Marcos and Tillema, 2006). Long term exposure to stress can lead to serious health problems. Chronic stress disrupts nearly every system in the body (Changing minds.org, 2011). It can raise blood pressure, suppress the immune system, increase the risk of heart attack and stroke; contribute to infertility and speed up the aging process. Long term stress can even rewire the brain leaving an individual more vulnerable to anxiety and depression (Tepas and Price, 2001). Kaplan and Sadock (2000) opined that learning and memory can be affected by stress.

It is completely normal for secondary school students to experience stress. This is because they deal with various pressures which cause stress. Causes of stress are referred to as stressors. According to Shah, Trevechi, Diwan, Dixit and Anand (2012) stressors don't cause anxiety or tension by themselves instead stress results from the interaction between stressors and the individual's perception and reaction to those stressors. The amount of stress experienced may be influenced by the individual's ability to effectively cope with stressful events and situations. Womble (2012) referred to stressors among students as "academic situational constraints", A study carried out by John Hopkins Boomberg School of Public Health (2006) identified five common stressors in secondary school students' life as school, family, friends, relationships and community. Bolyn (2012) also added factors such as social pressures and physical appearance to the list of stressors among students. Kelly, Kelly and Clanton (2001) asserted that the amount of sleep

students have access to may cause stress and thus influence their academic performance. They classified sleepers into three categories: (1).Short sleepers, individuals who, when left to set their own schedule slept six or fewer hours (2).Average sleepers, individuals who sleep seven to eight hours and (3) Long sleepers, individuals who sleep nine or more hours out of twenty- four.

The study found that people who were considered long sleepers reported less stress and higher school grades. However, Womble (2012) noted that the study did not take into account that some past researches on sleep suggest that people who sleep fewer hours at night may have psychological maladjustment. Sleeping shorter amounts of time has been shown to increase anxiety and stress which have been associated with academic performance (Kelly et al. 2001). These factors cause students' problems by causing shortened attention span and also increasing the number of errors, students make in tests. David (2011) also emphasized that secondary school years should be great experience but many demands and rapid changes can make them one of the most stressful times of life. Students today face increasing amounts of school work, a rapidly changing curriculum, assignment deadlines and examinations. Students worry about selecting careers and post secondary programmes. They must balance school work with sports, hobbies and social life.

All the factors reviewed in literature can contribute to a secondary school student's level of stress. By themselves these constraints may have no effect at all on a student but when combined, a student could perceive them as stressful and the stress factors could have a dramatic effect on a student's academic performance. With too many stress factors present and with limited resources of time and energy, a student could easily become overwhelmed. Marcos and Tillema (2006) emphasized that when stress is perceived negatively or becomes excessive, it can affect the health of students and thereby placing their academic future in jeopardy. According to Malik and Rehman (2012), high academic achievers are less vulnerable to stress.

In lieu of the negative effects of stressors among secondary school students, there is a need for early intervention that can help to reduce stress or enhance students coping skills. Dziegielwski, Turnage and Roest - Marti (2004) are of the opinion that if coping skills are effective in decreasing stress and feelings of anxiety, students have greater chances for academic success. Thus the purpose of this study was to find out the common stressors among Biology students, time of the term Biology students experience stress most, the perception of Biology students on the impact of stress on academic achievement and suggest ways to minimize or control stress among secondary school students

Research Questions
The following research questions were framed to guide the study
1. What are the common stressor found among Biology students
2. What time of the term do students experience stress most
3. What is the perceived impact of stress on academic achievement of Biology students
4. What are the ways to minimize or control stress encountered by students in secondary schools

Design
The research design used in this study is descriptive survey.

Participants
Participants in the study were one hundred (100) Senior Secondary School two students randomly selected through ballot method from Education District IV in Lagos State. Four secondary schools were randomly selected from this Education District. The mean age of the participants was 15.6 years with their age range between 13 and 18years.

Instrumentation
Stress Assessment Scale for Student (SASS) was designed by the researchers and it was the instrument used to collect data in this study. The SASS is a 39 item measure that assessed the perceived impact of stress on the academic achievement of Biology students. The structured scale items were in accordance with the research questions in the study. The scale comprised of section A and B. Section A was designed to collect personal data from the respondents while section B contained questions on the common stressors found among students, the time of the term

students experience stress most, the perceived impact of stress on the academic achievement of secondary school students and ways to minimize or control stress encountered by students. The structured scale was constructed using four points ranging from strongly agree (SA) to agree, (A) to disagree (D), and strongly disagree (SD). The instrument has the test retest reliability of 0.81.

Administration of the Instrument

The scale was administered with the permission of the principals in the four schools. Biology teachers in the schools assisted the researchers in administering the instrument. Students were encouraged to fill the scale truthfully since their responses were to be used for research purpose only. 25 questionnaires were administered in each school to make a total of one hundred questionnaire. The instrument was collected immediately after each administration.

Method of Data Analysis

Mean was used to analyze data. The mean response for each item was computed by multiplying the frequency of each response made by the nominal values. The sum of the values obtained by each item was divided by the total number of respondents to get the mean. The decision rule was that if the mean for an item is above 2.5 it shows acceptance for the item. If the mean for an item is below 2.5 it shows rejection for the item.

Results

Research Question One: What are the common stressors found among students

Table 1: Common stressors found among students

S/N	STATEMENT	SA	A	D	SD	X	REMARKS
1	Many demands, rapid changes can make biology one of the most stressful subject	55	30	10	5	3.4	Accepted
2	I usually have conflicts with my parents, friends, sibling and have to cope with unpredictable moods	84	10	2	4	3.7	Accepted
3	I am mostly concerned about my appearance	56	30	1	13	3.3	Accepted
4	I am concerned about fitting in with my peer group and handle love relationships and sexuality	49	14	16	16	2.9	Accepted
5	Environmental conditions such as heat, cold, excessive noise pollution, poor housing, traffic jam increase my stress level	78	12	6	4	3.6	Accepted
6	Competition and fear of failure increase my academic stress level	58	42	0	0	3.6	Accepted
7	I have financial problems	24	24	12	40	2.3	Rejected
8	I usually have conflict with my classmates	30	10	12	48	2.2	Rejected
9	I am stressed by excessive school work	50	20	20	10	3.1	Accepted
10	Inadequate recreational facilities at home and school causes stress to me	48	17	22	13	3.0	Accepted
11	Overcrowded classes stress students	36	14	39	16	2.8	Accepted
12	I place unrealistic expectations on myself	49	21	14	16	3.0	Accepted
13	The content of biology is too much so students are stressed	36	14	39	16	2.8	Accepted
14	I face competing time demands from my family and education	48	17	22	13	3.0	Accepted
15	My parents forced me to learn science	38	19	3	40	2.6	Accepted

Table 1 above revealed that the respondents accepted items 1 to 6 and 9 to 15. This showed that they accepted that conflict with parents, friend, siblings, concern about their appearance, fear

of failure, excessive school work, inadequate recreational facilities, overcrowded classes, the scope of biology are stressors found among students. These findings are in support of the assertions of John Hopkins Boomberg school of Public Health (2006) and Bolyn (2012). They found all these factors as stressors among school students. The table further revealed that items 7 and 8 were rejected by the respondents. This showed that the respondents did not accept financial problems and conflict among their classmates as stressors found among students.

Research Question Two: What time of the term do students' experience stress most?

Table 2

S/N	STATEMENT	SA	A	D	SD	X	REMARKS
16	At the beginning of the term 1 experience a lot of stress because of the new leaning materials introduced by my teacher	40	30	17	13	3.0	Accepted
17	I experience a lot of stress at the beginning of the term when I have not made friend	40	31	14	15	3.0	Accepted
18	I am usually stressed at the beginning of the term because of my studies	38	40	12	10	3.1	Accepted
19	I experience more stress at the end of the term than at the beginning or middle of the term because of my studies	50	30	10	10	3.2	Accepted
20	I am not usually stressed at the middle of the term because I would have made friends who help with my school work	35	20	15	30	2.6	Accepted
21	Teachers give so many tests, assignments and notes at the end of the term which cause a lot of stress	48	24	18	10	3.1	Accepted
22	I am not usually stressed at the middle of the term since I would have gotten used to class routines	37	28	20	15	2.9	Accepted
23	I don't sleep well at the end of the term when I have to prepare for examination	45	32	8	5	3.3	Accepted
24	I am most stressed at a. Beginning of the term	38	29	25	8	3.0	Accepted
	b. Middle of the term	20	15	30	35	2.2	Rejected
	c. End of the term	61	29	4	6	3.5	Accepted

Table 2 above showed that the respondents accepted all the items except item 24b. This implies that students accepted that they experience stress at the beginning of the term because of the new learning materials introduced by their teacher and because they would not have made friends. They accepted that they are most stressed at the end of the term, more stressed at beginning of the term and least stressed at the middle of the term. These findings are in support of Seyedfatemi, Maryam & Hagani (2007) who highlighted that new students at the beginning of the term face academic demands, the need to adapt to new learning environments in terms of the increased complexity of materials to be learned, the need to constantly self regulate and to develop better thinking skills including learning to use specific learning techniques. Womble (2003) also support out that students experience most stress at the end of term since they usually sit for their examinations at this time. These examinations are the most important criteria that make up their grades. Also, teachers rush to finish up the syllabus for the term just before examinations starts. All these make the end of the term most stressful for students

Research Question Three: What is the perceived impact of stress on academic achievement of Biology students in secondary schools?

Table 3: Perceived impact of stress on academic
achievement of Biology students

S/N	STATEMENT	SA	A	D	SD	X	REMARKS
25	An optimal level of stress enhances my learning ability	4	12	38	35	1.6	Rejected
26	I find it difficult to concentrate in class when I am stressed	78	12	4	6	3.6	Accepted
27	I became sick and unable to concentrate when I am under pressure	54	30	10	6	3.3	Accepted
28	I am usually disenchanted with school work when I face stress	48	39	10	3	3.3	Accepted
29	I perform poorly in class when I am tired and all stress up	61	19	12	8	3.3	Accepted
30	Stress makes me hopeless and this results in disengagement meat from my school work	45	15	39	11	3.1	Accepted

Table 3 revealed that the respondents rejected item 25 with an average mean score of 1.6. The respondents disagreed that optimal level of stress enhances their learning ability. The table further revealed that the respondents accepted items 26, 27, 28, 29, and 30 with mean scores of 3.6, 3.3, 3.3, 3.3 and 3.1 respectively. This implied that students find it difficult to concentrate in class when they are stressed, pressure makes them feel sick, stress causes disenchantment with school work, tiredness and stress makes students to perform poorly in class, stress leads to hopelessness that in turn results in disengagement from school work.

From these findings, it is obvious that students perceived stress as a hindrance academic performance. Womble (2003) noted that when the level of perceived stress is high, academic performance is lower. Laura (2001) supported that for students to achieve optimal academic performance they must overcome many obstacles caused by stress.

Research Question Four: What are the ways to minimize or control stress encountered by students.

Table 4: Ways to minimize or control stress by students

S/N	STATEMENT	SA	A	D	SD	X	REMARKS
31	I find it easy to deal with challenging problems when I am in a relaxed state of mind and body.	30	30	35	5	2.9	Accepted
32	Relaxation, mediation, deep breathing activates my body system by increasing the feelings of joy	59	23	8	10	3.3	Accepted
33	Opting for things that are most important helps to reduce stress level	80	10	7	3	3.7	Accepted
34	A cool and calm environment helps to promote thinking ability	35	29	10	26	2.7	Accepted
35	Getting enough sleep helps keep the body and mind equipped to deal with negative stressors	59	30	10	6	3.3	Accepted
36	Eating well helps the body get the right fuel to function at its best and so minimize stress	54	30	10	6	3.3	Accepted

37	Learning to solve everyday problems give a sense of control that helps minimize stress	45	30	7	18	3.0	Accepted
38	Optimism (thinking positive) enables one to cope with stressful situation	78	12	6	4	3.6	Accepted
39	Good relationship with family members, friends and peers help to ease or reduce stress while fostering a lasting relationship	55	30	10	5	3.4	Accepted
40	When I do my school work sequentially, stress is reduced	59	23	8	10	3.3	Accepted
41	Regular exercise helps to minimize stress	35	29	10	26	2.7	Accepted
42	I feel less stressed when I manage my time properly	79	11	7	3	3.7	Accepted

Table 4 above revealed that the respondents accepted all the items with the mean scores of 2.9, 3.3, 3.7, 2.7, 3.3, 3.3, 3.0, 3.6, 3.4, 3.3, 2.7, and 3.7. They accepted that relaxed state of mind, doing things that are most important, getting enough sleep, eating well, optimism, having good relationship with family members, friends and peers, working sequentially, regular exercise and proper time management all help to minimize or control stress. These findings are in line with the opinion of changing minds.org 2011 which stated that students can reduce the impact of stress by learning how to manage stress, learning how to relax, taking a stand against over scheduling, getting good night sleep, treating one's body well, solving the little problems first, thinking positively. When students learn stress coping or reduction skills, they adjust better to school life.

Recommendation
The following recommendations were made from the study.

1.   Teachers should plan their lessons and sequentially execute their plan so that too much work is not given to students at the end of the term.

2.   Parents should encourage their children to sleep early enough so that their body and mind would be in calm state. The body could be said to have an innate or natural ability that can effectively manage stressors as a result of adequte sleep.

3.   Students should also be encouraged to do their school work sequentially so that their work would not pile up at the end of the term.

4.   School administrators should organize seminars for students on stress management periodically.

5.   School administrator should also encourage the right teacher student ratio in the class.

Conclusion
This study has investigated common stressors found among students, the time of the term students feel stressed most, perceived impact of stress on academic achievement and ways to minimize or control stress among students. It has been revealed through the study that students are stressed most at the end of the term, stress is perceived to have negative impact on academic achievement. Also eating well, being optimist, having good relationship with family and friends help to minimize or control stress.

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