

**EFFECTS OF COGNITIVE RESTRUCTURING ON
STRESS FACTORS AND ACADEMIC PERFORMANCE
OF SENIOR SECONDARY SCHOOL STUDENTS IN
OGUN STATE, NIGERIA**

BY

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Matric No: 909003025

OCTOBER, 2017

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**EFFECT OF COGNITIVE RESTRUCTURING ON STRESS FACTORS AND
ACADEMIC PERFORMANCE OF SENIOR SECONDARY SCHOOL
STUDENTS IN OGUN STATE, NIGERIA**

**Submitted to the
School of Postgraduate Studies
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**For the award of the degree of
DOCTOR OF PHILOSOPHY (Ph.D.)
is a record of original research carried out**

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DEDICATION

This thesis is dedicated to God Almighty my creator, my strong pillar, my source of inspiration, wisdom, knowledge and understanding. He has been my source of strength throughout this programme. I also dedicate this work to my darling husband; Oluwafemi Akin-Johnson who has been a pillar of support and encouragement for me all the way and whose encouragement has propelled me to give all it takes to finish which that I started. To my darling, lovely daughters Tolulope, Temiloluwa and Timilehin who have been affected in every way possible by this quest. And to my sweet Mum for all her prayers, support and encouragement.

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ABSTRACT

This study investigated the effect of Cognitive Restructuring on stress factors and academic performance of Senior Secondary School Students in Ogun State, Nigeria. The study was carried out due to persistent low performance in Mathematics and English Language, which could be attributed to a lot of stress that students encounter in the quest to learn and understand these two subjects. Senior Secondary School students hold the negative view that Mathematics and English Language are subjects that are too stressful and difficult to record good grades. Ensuring good performance in these subjects, students undergo a lot of stress which has an adverse effect on their normal body functions and eventually affects their academic performance. Cognitive Restructuring was introduced as a counselling therapy to reduce stress and improve academic performance in Mathematics and English Language. Quasi-experimental pre-test/post-test Control Group designs were adopted for the study. Simple and stratified random sampling techniques were used to select 161 participants, consisting of 84 male and 77 female participants drawn from four Senior Secondary Schools in Ogun State. Four research instruments were adapted and used to generate data for the study. The instruments were Mathematics Performance Test (MPT), English Language Achievement Test (), Scale for Assessing Academic Stress (SAAS), and Educational Stress Scale for Adolescents (ESSA). All these instruments were used for pre-test and post-test assessments. Six research questions were raised and six research hypotheses were formulated to guide the study. The data generated were analysed statistically, using Analysis of Covariance (ANCOVA) tested at 0.05 level of significance. Three hypotheses were rejected while three others were not rejected. The results of the data analyses revealed that gender did not significantly influence social and physical stress among participants. There was also no significant effect of experimental conditions and stress level on post-test scores of academic performance in Mathematics among the participants. However, the study found out that there was significant effect between experimental conditions and gender in post-test mean scores of academic stress among participants. There was also significant effect between experimental conditions and gender in post-test mean scores of general stress among participants, and there was significant effect of experimental conditions and stress level on post-test scores of academic performance in English Language among the participants. In view of the findings of the Study, some recommendations were made. Recommendations were proffered among which is the need for workshops and seminars to be organized to train teachers on the use of cognitive restructuring intervention techniques in the classroom to address the issue of student's stress. Counsellors and psychologists should endeavour to attend conferences, workshops to be acquainted with current and relevant literatures on cognitive restructuring and stress to enable them tackle the problem of low achievers in Mathematics and English language. Some suggestions for further research were also stated, implication of findings for counsellors, teachers as well as parents were highlighted and conclusions drawn.

Keywords: Academic Performance, Cognitive Restructuring, Stress, Stress factors.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The school, its activities and environment is motivating to students because it is viewed as a place where knowledge acquired is used to determine the progress and future of the students. It is also viewed as a stressful place where students go through rigorous work for academic survival. The challenging issues in terms of stress factors - which may include difficulty in solving assignments, inability to understand lessons, peer pressure issues, hatred of some courses(subjects) like Mathematics, test/exam phobia, to mention but a few-tend to affect the physical, academic (mental), social and psychological aspects of their lives. These factors, which put pressure on secondary school students (most of whom are youthful), consequently may become sources of stress to them, thereby affecting their academic performance.

Stress is a serious challenge in academic content as well as in our everyday life. It normally occurs when an individual is confronted by a situation that he/she perceives as overwhelming and which they cannot cope with. Malach-Pines and Keinan (2007) defined stress as the perception of discrepancy between environmental demands (stressors) and individual capacities to fulfil these demands. One of the major characteristics of stress is that it is universal. In other words, it is not restricted to any age group, gender, profession, tribe or nationality. It is no respecter of socio-economic status or level of education. As man cannot live without food and air, so also man cannot successfully and completely avoid stressors or live without stress. According to Agulama (1994), the principle of universality of stress states that stressors are found in all environments of man as air is found in all environments of man, though stressors may differ in quality, intensity, mechanics and dynamics. The implication of this principle is

that stress is an inevitable and a common phenomenon in all areas of human institutions and endeavours.

Three major areas of human endeavours are home, school and the world of work. These three major areas are the most important and demanding human institutions and therefore prone to much stress for their effective management and survival. Despite this, there could be individual differences in the extent to which people are susceptible to stress or predisposed to tolerate stressors. Although it has been established medically that stress is an inevitable part of life, yet it can be constructive or destructive (Jimeta, 1996). Constructive stress, which is also known as eustress, is stress that is at a low level and prompts productivity. On the other hand, stress is said to be destructive (distress) when it has the tendency to overload and breakdown a person's physical and mental systems (Adesina, 1990). Distress happens when there is too much stress and when nothing is done to eliminate, reduce or counteract its effects. It usually occurs when great importance is placed on a situation or an event to the extent that it puts great demands on the individual over which he/she eventually perceives to have little or no control. For example, writing a promotional or final examination which is directly needed for graduation can be a big source of stress to students. Once a student's mental system breaks down through excessive stress or distress, he or she ceases to be productive and mentally alert.

Secondary school students are not exempted from stress since learning is the major pre-occupation of students in any formal educational system. Learning, as it were, is a very demanding exercise because it requires not only the acquisition of knowledge but also its comprehension and application, as well as the possibility of positive transfer of the acquired knowledge to solve problems in new situations. Hence, students pass through a lot of stress to ensure that whatever they are taught is actually learnt. This implies that, to be educated, a lot of

processes, grills and drills are involved which are usually stressful to the learners. These drills and processes may lead to academic stress if not properly managed.

Academic stress is the product of a combination of academic-related challenges that exceed the adaptive resources available to an individual. If a student is unable to cope effectively with academic stress, then it may result in serious psycho-social-emotional health consequences (Arthur, 1998). This may include feeling depressed because of low cumulative average, being worried about academic progress, having to find solutions to too many assignments, and so on. Students who experience mental problems are then at greater risk of poor academic performance, thus increasing academic stress. Apart from academic stress, social stress may also affect a student's academic performance.

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Social stress factors are stressors originating from the family, family relations and friends or peers. Forming new relationships and making new friends may be a major headache for some high school students. Giving up or changing old friends and developing new ones are oftentimes stressful activities associated with high school life (Greenberg, 1996). Again, pressure exerts by families and students can also be a source of stress. Parents expect their children to get high grades and this is a major source of stress to high school students. When academic and social stress factors are not properly managed, it could lead to physical stress.

Physical stress factors are stressors that produce pain and impair an individual's academic performance. They can affect the skin, bones, ligaments, tendons, muscles and nerves, causing tissue deformation and, in extreme cases, tissue failure which can affect students' mental alertness, thereby affecting academic performance. Chronic pain and impairment requiring medical attention may result from extreme physical stressors or if there is no sufficient recovery

time in-between successive exposures (National Research Council, 2001). Examples of physical stress symptoms include headaches, lack of energy, inability to sleep, chest pain, clenched jaw and stomach problems.

Stress, which is a universal indicator, may also affect both male and female students in the school. There are various conflicting views as regards stress based on gender because irrespective of the type of stress that students face either at home or in the school both male and female students are affected. The level of stress students face could also affect their performance negatively if not well managed (Stevenson and Harper, 2006). That is, the feelings of stress can be converted into positive energy and actually become a motivating factor to the students. This, of course, is a desirable outcome of stress. An example of positive stress is the anxiety a student feels before taking a test. If no anxiety is felt, he/she might not have the motivation and energy to spend the necessary time studying for the examination. Thus, this type of stress is helpful. High and low stress can lead to decline in performance, whereas a moderate level of arousal results in the highest level of performance. Despite this, the optimal level of arousal is different for each person (Muse, Harris and Field, 2003). This optimal level could help in improving students' academic performance especially in subjects like Mathematics and English Language which are core subject in school curriculum.

Mathematics and English Language, as important subjects in modern society, are useful in schools, workplaces, businesses and for personal decision-making. Mathematics is seen to be a subject for everyday use, whether in the marketplace, school or even at home. English Language, which is Nigeria's lingua franca, is also one of the core subjects taught in schools, just as it is also a means of communication (Omoegun, 2009). The usefulness of Mathematics can even be observed in the application of numbers to measure length, volume, weight, density,

temperature, speed and acceleration. In Nigeria, English Language is a medium of communication for socio-political activities and for assessing academic achievement. English Language also serves as the language of nationalism, which is concerned with political integration and efficiency (Bamgbose, 1991). It also provides individuals with access to crucial knowledge, skills, employment, opportunities, just as it enables organisations to create and sustain international links.

Despite the importance placed on Mathematics and English Language by the society, some students lack interest in the subjects and this leads to their poor performance (MaduabumandOdili, 2006). In Nigeria, these subjects were made the core subjects taught at all levels but students seem to shy away from them for many reasons, some of which include phobia, stress in assimilating the subjects, teachers' attitudes towards the teaching of the subjects and students' negative attitude stemming from the assumption that Mathematics and English Language are generally difficult subjects to study (Okereke, 2006). These negative attitudes, thoughts, as well as stress could be reduced through the use of Cognitive Restructuring.

To properly manage stress and improve academic performance in Mathematics and English, Cognitive Restructuring seems to be one of the counselling therapies that could be used in managing stress and change maladaptive thoughts, feelings and beliefs about stress. This therapy could be used by making a realistic evaluation and modification of the student's thinking/belief and self-statements, which would change their emotions thereby, improve academic performance. This therapeutic technique varies according to the particular kind of client or issues and this commonly include keeping a diary of significant events and associated feelings, thoughts and behaviours; questioning and testing assumptions or habits of thoughts that

might be unhelpful and unrealistic; gradually facing activities which may have been avoided; and trying out new ways of behaving and reacting. To buttress this, Okwun (2011) sees Cognitive restructuring as a change strategy, with an educative process of actively correcting maladaptive thoughts and beliefs.

In a school setting, the way one prepares for an examination also affects the way one feels and thinks. An individual who deals with an upcoming examination by putting off his studies until the last minute is likely to experience more stress on the day of the examination than an individual who has studied well in advance. If this occurs, there is a high tendency for the individual to perform below expectation. Cognitive Restructuring helps people to learn new behaviours and new ways of coping with stress which could reduce the effect on the academic performance of students.

1.2 Statement of the Problem

Over the years in Nigeria, especially at the post-primary school level, students generally come to hold the view that Mathematics and English Language are subjects too difficult to understand or pass easily even with extra effort thus resulting into causing stress to the students which affect academic performance. Many secondary school students have developed some elements of fear about these two subjects. This is always as a result of long term negative information they get every year about the poor and low level performance in WAEC and NECO English and Mathematics results. Since most of these students have lost hope and are psychologically defeated due to fear, this has affected their level of interest in these subjects and while trying to put in efforts, the attendant consequent is that they get stressed up. Many English and Mathematics teachers have failed to boost their students' morale in these subjects and have

failed to teach these subjects in ways that make it fun and interactive for students to enjoy while learning.

Further strengthening this is the view of the requirements for admission by higher institutions, which stipulate that students should make at least five (5) credit passes, including these two core subjects (Mathematics and English Language). Often times, some prospective admission seekers might have been denied the opportunity of gaining admission into higher institution due to this admission policy. This has also contributed immensely to students' stress. Outside the school environment, most employers of labour require applicants to sit for and pass Mathematics and English Language aptitude tests before they can be employed in their organisations.

Many would-be secondary school-leavers have the fear that they cannot gain admission into higher institution without passing Mathematics and English Language. In the quest to meet up with university and employment requirements with good grades in Mathematics and English Language, some students go the extra mile by studying hard day and night. Some even use sleep suppressants in order to ensure success in these two core subjects. Taking such extreme measures, they likely experience different forms of stress, such as academic and physical stress, which affect their academic performance. The emphasis placed on academic achievement seems to put great pressure on students. This caused students a lot of stress, especially when facing different academic challenges in both English Language and Mathematics.

The attitude of some teachers may increase students' stress. Some teachers seem to teach academic contents only, without employing adequate teaching strategies(methods) to teach the subjects. Students who do not have sufficient work knowledge also encounter challenges in tackling English and mathematical problems. Presumably, some students might have difficulty

mastering the content that teachers teach. They might not learn successfully and this could affect learning outcomes and increase stress level.

Home-related problems that secondary school students face such as waking up early, punctuality to school, inadequate finance, feeding, finding solution to many assignments, overcrowded class, scarcity of Mathematics and English Language textbooks, epileptic power supply, preparation for tests and examinations, competition with other students, lack of pocket money, poor relationship with other students or teachers and family may be attributed to stressors. These challenges require attention otherwise it may lead to frustration, stress and low academic performance. The resultant effect associated with stress may often times include frustration, suicide, violence, drug abuse and poor academic performance, to mention just a few, and they are worth paying attention to.

1.3 Theoretical Framework

There are several theories of Cognitive Restructuring strategies appropriate for the group treatment of stress among senior secondary students but the three that have provided a framework on which this study is hinged are:

- a. Optimal Level of Arousal Theory of Stress by Muse, Marris and Field (2003)
- b. Cognitive Appraisal Theory by Lazarus and Folkman (1984)
- c. Rational Emotive Behavioural Theory (REBT)(1962)

Optimal Level of Arousal Theory of Stress: The Optimal Level of Arousal Theory of Stress is otherwise called Inverted U-theory of Stress. The theory was put forward by Muse, Marris and Field (2003). The theory asserts that stress can be positive or negative. Positive stress is called eustress, and is the type that occurs when stressors result in feelings of challenge or achievement. It is a desirable outcome of stress. This theory proposes that some stress in this

situation is probably helpful. However, if an individual is experiencing too much stress, his performance will decline. This is what is known as the optimal level arousal or Inverted U-theory. As shown in figure 1.1.

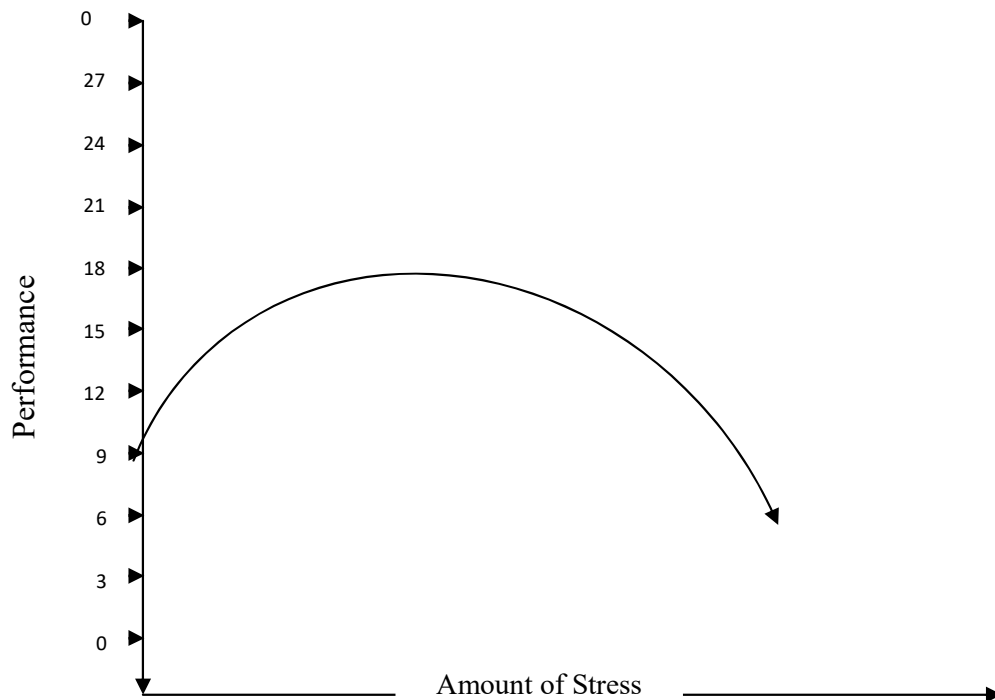


Fig. 1: The optimal level of arousal

According to the Inverted U-theory, having little arousal or too much arousal results in poor performance; whereas, a moderate level results in the highest level of performance. Meanwhile, the optimal level of arousal is different for each person. This theory is relevant to this study because it helps in assisting participants to see their stressors as a challenge, motivating them towards better achievement, and teaching them how to effectively manage stressors rather than allowing them to affect their academic performance.

Cognitive Appraisal Theory: Cognitive Appraisal Theory was propounded by Lazarus and Folkman (1984). The theory states that the amount of stress that an individual experiences depends on his cognitive appraisal of the event or situation. It was put forward to explain how human interpretation of potentially stressful events has the tendency to affect their reactions to the events such as performance. Cognitive appraisal simply refers to the mental process by which people assess or judge any event or situation confronting them. The theory asserts that when human beings are faced with any situation or event, they almost automatically engage

their mental process to assess the event. The implication of this theory in the context of this study is that when students appraise their academic performance as a challenge, the stress that produced the challenge can produce a sense of competence and increased capacity to learn. On the other hand, when their academic performance is perceived as a threat, the resulting stress can engender feelings of helplessness and a foreboding sense of loss (Whitman, 1985). This is because situations are not stressful in themselves; rather, it is our interpretation of the situation that produces and sustains the level of stress that we feel. Hence, in this study, counselling is tailored towards modifying participants' perception and appraisal of stressful events as well as their expectations regarding their ability to cope.

Rational Emotive Behavioural Theory (REBT): This theory was developed by Albert Ellis (1962). It is based on the premise that whenever we are upset, it is not the events taking place in our lives that upset us; it is the beliefs that we hold that cause us to become stressed, depressed or anxious. It also focuses on resolving emotional and behavioural problems and disturbances, and enabling people to live happier and more fulfilling lives. A fundamental premise of REBT is that humans do not get emotionally disturbed by unfortunate circumstances, but by how they construct their views of these circumstances through their language, evaluative beliefs, meanings and philosophies about the world, themselves and others.

According to Ellis (1962), the vast majority of us want to be happy: whether we are alone or with others; we want to get along with others, especially with one or two close friends; we want to be well-informed and educated; we want a good job with good pay; and we want to have a good grade. Of course, life doesn't always allow us to have what we want. Our goal of being happy is often thwarted by the slings and arrows of outrageous fortune. When our goals are blocked, we can respond in ways that are healthy and helpful, or we can react in ways that are unhealthy and unhelpful. Albert Ellis stated that all emotions and behaviours are caused by what people believe about the situations they face. The relevance of this theory is that students who

are stressed as a result of poor academic performance to the point of having negative thoughts about themselves can have a rethink to change their thoughts and beliefs to positive ones.

1.1 The Conceptual Model of Cognitive Restructuring on Stress and Academic Performance

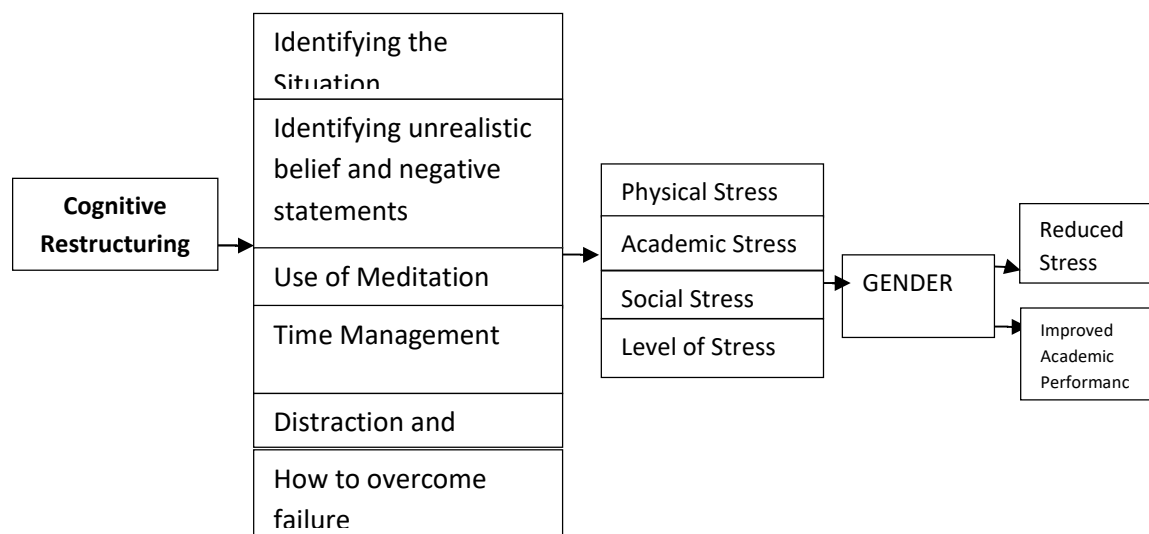


Fig.2: *Researcher's Model*

The conceptual framework above illustrated the use of cognitive restructuring as a therapy to reduce physical, social and academic stress, level of stress and enhance students' academic achievement among male and female students in Mathematics and English Language. The researcher was interested in the effects of Cognitive Restructuring on Stress and Academic Performance. This was done by taking participants through the stepwise procedural intervention of the therapy which helps the students to identify the situation at hand, automatic thought, unrealistic belief and negative statements, use of meditation, time management, Distraction and Humour and overcoming failure. With the introduction of this intervention, the stress factors and stress level contributing to poor academic Performance was reduced thereby improving academic performance in both Mathematics and English Language.

1.4 Purpose of the Study

The main goal of this study is to evaluate the effectiveness of Cognitive Restructuring on stress factors and academic performance among Senior Secondary School students in Ogun State. The specific objectives of this study are to:

1. determine the effect of Cognitive Restructuring and gender on social stress among the participants in the two experimental groups.
2. establish the effect of Cognitive Restructuring and gender on physical stress among the participants in the two experimental groups.
3. examine the effect of Cognitive Restructuring and gender on academic stress among the participants in the two experimental groups.
4. find the interaction effects of experimental conditions and gender on post-test mean scores of stress among participants.
5. investigate the interaction effect between experimental conditions and stress level on post-test scores of academic performance in Mathematics among the participants.
6. establish the effect between experimental conditions and stress level on post-test scores of academic performance in English Language among the participants.

1.5 Research Questions: This study provided solutions to the following research questions:

1. What is the effect of Cognitive Restructuring and gender on post-test mean scores of social stress among participants across the two groups?
2. how do experimental conditions and gender have effect on post-test mean scores of physical stress among the participants?
3. what would be the effect of Cognitive Restructuring and gender on post-test mean scores of academic stress among the participants?

4. how would experimental conditions and gender have an interaction effect on post-test mean scores of stress among participants?
5. what is the interaction effect between experimental conditions and stress level on post-test scores of academic performance in Mathematics among the participants?
6. how would experimental conditions and stress level have an effect on post-test scores of academic performance in English Language among the participants?

1.6 Research Hypotheses

The following hypotheses were tested in this study at 0.05 level of significance:

1. gender and experimental conditions would not have significant effect on social stress factors among participants.
2. gender and experimental conditions would not have significant effect on post-test mean scores on physical stress factors among participants.
3. significant effect of gender and experimental condition would not occur on post-test scores in academic stress factors among participants.
4. experimental condition and gender would not significantly have interaction effect on post-test mean scores of stress among participants.
5. experimental condition and stress level would not have significant interaction effect on academic performance in Mathematics among participants.
6. experimental conditions and stress level would not have significant effect on academic performance in English Language among participants.

1.7 Significance of the Study

The findings of this study would hold immense benefit for parents, teachers, educational planners, educational administrators and students. Students would benefit from this study as the findings will provide an insight into the positive relationship between stress and academic

performance.

Teachers will also be able to identify the positive and negative impact of stress on students' academic performance. The study will provide them with detailed information about the primary and secondary stress factors affecting the academic performance of students in school. The result will be profitable to the guidance counsellors in the educational system. It will help them in the appropriate diagnosis of academic, social and physical problems relating to stress.

The study would assist parents in identifying the levels of stress of their children and manage them accordingly.

The result would also be of benefit to parents by providing them with the knowledge required to prevent the causes of stress among their children/wards. The study would help the government to provide guidance services that would develop confidence among students for better adjustment in the classroom, family and society so that they can use their potential and talents to achieve success in life.

The study would also help policy-makers to formulate policy on adequate planning in academic work such that there would be enough intervals between the periods of examinations and continuous assessment tests. It will also aid the management of secondary schools to assess their students' stress level and contributing factors in order to provide them with suitable mental healthcare and efficient methods for managing such stress factors.

1.8 Scope and Delimitation of the Study

The study was limited to some selected senior secondary school students in Ogun State, Nigeria. The study covered Cognitive Restructuring, Stress, stress factors, levels of stress, gender and

academic performance in English Language and Mathematics.

1.9 Operational Definition of Terms

In order to understand this study, the following terms and major concepts were operationally defined.

Academic Performance: In the context of this study, academic performance refers to the performance of students in Mathematics and English Language before and after being subjected to training.

Cognitive Restructuring: Cognitive Restructuring is a counselling strategy used in managing stress and changing maladaptive behaviours, beliefs, feelings and negative thoughts about Mathematics and English Language.

Level of Stress: In this study, it refers to high, medium or low level stress, depending on the indication of these levels by participants when measured using Educational Stress Scale for Adolescents

Stress: Stress is defined as a state of psychological arousal that results when external demands task or exceed a person's adaptive abilities. In this study academic stress is operationally defined as stress measured by Scale for Assessing Academic Stress (SAAS) – Sinha et al., (2001).

Stress Factors: In the context of this study, stress factors are those factors, events or situations in the school that cause stress. They include academic problems, academic failure, fear of examination, poor study habit, and increased population of students finance and relationships.

Social Stress: In this study, it refers to stress that students go through during interaction with friends, family, peers indicated in the questionnaire by the participants.

Physical Stress: In this study, it refers to stress encountered during academic pursuit in terms of pain as indicated by participants during the study.

Academic Stress: In this study, it refers to academic related issues that resulted in stress which

are identified by the participants during the study

CHAPTER TWO

LITERATURE REVIEW

The effect of cognitive restructuring on stress factors and academic performance of senior secondary school students were examined by reviewing related and current literature extensively under the following subheadings:

- 2.1 The concept of stress and stress factors
- 2.2 Sources of students' stress
- 2.3 Concept of cognitive restructuring
- 2.4 Cognitive restructuring, social stress, gender and academic performance
- 2.5 Cognitive restructuring, physical stress, gender and academic performance
- 2.6 Cognitive restructuring, academic stress, gender and academic performance
- 2.7 Gender difference and stress
- 2.8 Stress level and academic performance
- 2.9 Concepts and nature of mathematics
- 2.10 Mathematics curriculum in Nigeria
- 2.11 The usefulness of mathematics in secondary school curriculum
- 2.12 English language curriculum in Nigeria
- 2.13 Appraisal of literature review

2.1 The Concept of Stress and Stress factors

Stress is one of those concepts that do not lend itself to a specific simple, single or precise definition because it is eclectic in nature. It has as many definitions as there are authors, psychologists and researchers on it. According to Ezeilo and Chukwu, (1994), stress is viewed as the subjective experience of the student when event associated with his/her student status interact with the student's personal characteristics to change his/her psychological and /or physiological conditions, such that the student is forced to deviate from normal functioning. It

is the psychological and physical reaction to certain life events or situations. Passer (2001) describes stress as a pattern of cognitive appraisals, physiological responses and behavioural tendencies that occurs in response to a perceived imbalance between situational demands and resources needed to cope with them.

The stress process begins with life events or situations that cause stress. These life events are called stressors, such things as appointments, academics, fear, marriage, work etc. If we perceive these events as being stressful, our bodies respond in many ways, including elevated blood pressure, increased heart-beat, muscle tension, and perspiration. These reactions are called stress reactivity (Aamodt, 2007). If these physical reactions occur for period longer than our body can tolerate, negative physical and psychological consequences can occur and these consequences are called Strains (Greenberg, 1996).

Researchers (Vermunt and Steensman, 2005; Topper, 2007; Ussery and Waters, 2007; Malach-Pines and Keinan, 2007) have defined stress as the perception of discrepancy between environmental demands (stressors) and individual capacities to fulfil these demands. While researcher (Campbell, 2006) defines stress as the adverse reaction people have to excessive pressure or other types of demands placed on them. Stress occurs when an individual is confronted by a situation that they perceive as overwhelming and cannot cope up with.

Stress among students have long been researched on, and researchers have identified stressors as too many assignments, competition with other students, failures, lack of pocket money (Fairbrother and Warn, 2003), poor relationships with other students or lecturers, family or problems at home. Institutional (university) level stressors are overcrowded lecture halls, (Ongori, 2007; Awino and Agolla, 2008), semester system, and inadequate resources to perform academic work. Erkutlu and Chafra (2006) for instance opines that, when these events

take place, an individual becomes disorganised, disoriented and therefore less able to cope up, thus resulting in stress related health problems. The pressure to perform well in the examination or test and time allocated makes academic environment very stressful (Erkutlu and Chafra, 2006; Polychronopoulou and Divaris, 2005; Misra and McKean, 2000).

This is likely to affect the social relations both within the school and outside (Fairbrother and Warn, 2004) since there is conflict with the social aspect of one's life. This not only affects the social relations within or outside the school but this goes to affect the individual person's life in terms of commitment to achieving the goals. Knowing the causes of students' stress will make the schools' administrator know how to monitor and control the stress factors that are responsible for the students' stress. Scholars (Ornelas and Kleiner, 2003; Jaramillo, Nixon and Sams, 2005; Verment and Steesma, 2005; Ongori, 2007; Topper, 2007; Ongori and Agolla, 2008; Agolla, 2009) for instance identified the symptoms and the causes of stress in work environments as sitting for a long period of time, poor work performance, poor inter-personal relationship, inadequate or lack of resources, inadequate time to perform particular assignments, poor working conditions, overcrowded work stations, excessive paperwork, and many others. Whereas these factors have been found to be responsible for stress, it is worth noting that in order to minimise the stress among students, the schools' administrators must develop appropriate strategies that will enable them to detect in advance the symptoms and causes of the stress.

Researchers (Malach-Pines and Keinan, 2007; Ongori, 2007; Ongori and Agolla, 2008; Agolla, 2009) have long identified stress symptoms as lack of energy, taking over the counter medication, high blood pressure, feeling depressed, increase in appetite, trouble concentrating, restlessness, tensions and anxiety among others. An individual experiencing one of these factors

is likely to be a victim of stress. Although this may also depend on how the individual appraises the situation, and how resilient the person is. The negative effects of stress on an individual may vary considerably from one student based on their previous encounter with situations and the resilience of the individual student.

In their findings (Jaramillo et al. 2005; Stevenson and Harper, 2006) point out that the perception of the individual determines whether or not the stressor has a detrimental effect; that is whether it causes physical or psychological symptoms of stress in the individual. Earlier study by Siegrist (1998) also indicated a close link between high amounts of occupational stress and ill-health. This means that deterioration in health of the individual is likely to affect the individual's performance. In a higher learning institution such as University (Smith et al. 2000) where the demand placed on students is based on deadlines and pressure for excelling in tests or examination, students are likely to be the victims of 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 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. 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 Bloomberg 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, Kelly & Clanton, 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 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.

Stress factors are otherwise called stressors. They are special kind of eliciting stimuli which may be physical, psychological, real or imagined. They are the contributory factors that lead to stress. They characteristically place demand on us, endanger our well-being, and require us to adapt in some manner. A stressor is any life changer on individuals, whether negative or positive and often has negative impact (Akinade, 2007). According to Aamodt (2007) many events and factors could be considered stressors. Meanwhile, what is stressful for one person may not necessarily be for another. Also, what determines if something will be a stressor depends a great deal on its importance and the amount of perceived controllability.

Aamodt (2007) grouped stressor factors under two broad categories, which are personal and occupational. The factors he regarded as personal stressors are fear, resistance to change, and resentment. Occupational stressors are those that have to do with workforce and stress that work brings. Occupational stressors are also grouped under two broad categories which are the job characteristics and organizational characteristics (Cordes and Dougherty, 1993). Kamarudin, Aris, Mohd.; Siong, Mohamed and Ibrahim (2009) did a study on the Impact of Perceived Stress and Stress Factors on Academic Performance of Pre-Diploma Science Students and listed

some stress factors to academic performance as:

Health-related stressors: There are three health-related factors which contribute to the academic performance of students. These factors comprise amount of exercise, sleeping habits and nutritional routines (Hammer, Grigsby & Woods 1998) which have been found to contribute to how a student performs academically. These factors are discussed below.

Exercise: Researchers have evaluated the effect of exercise on the academic performance of university students, but arrived at different findings. Turbow (1985), in a study involving 891 upperclassmen and graduate students, found that students who exercised seven or more hours per week obtained significantly lower grades than students who exercised six or fewer hours weekly or who do not exercise at all. The same results were reported in Trockel, Barnes and Egget (2000) study. They opine that taking time out of frequent study hours to work out pulls away the grades of students. Trockel et al. (2000) further observed that a frequent occurrence on college campuses is that students becoming almost addicted to exercise, turning a healthy behaviour into one that is psychologically unhealthy.

Nutrition: Another aspect of health-related factor that has been shown to be related to academic performance is nutrition. One aspect of the relationship between diet and academic performance concerns the consumption of a breakfast meal. Eating breakfast appears to predict high GPAs (Trockel et al., 2000), and it seems to influence the recall ability and short-term spatial memory (Benton and Sargent, 1992). However, Trockel et al. (2000) demonstrates that eating breakfast did not significantly affect semester GPA after controlling for the effects of weekend and weekday wake-up times. Although the effects of eating breakfast (Benton and Sargent, 1992; Meyers et al, 1989; Pollitt, 1995) and other nutritional variables on the academic performance of elementary students (Kalman, 1997) have received much attention in the literature, little

information on the effects of nutritional habits on the academic performance of college students can be found.

Family and social support: A considerable number of studies have been conducted to examine the effects of parental, family members, friends, academics, and peers support on anxiety and academic performance of college students (Cutrona et al., 1994; DeBerard et al., 2004; Hackett et al., 1992; Lazarus and Folkman, 1984; Mallinckrodt, 1988; Orpen, 1996; Smith and Renk, 2007; William, 1996). However, the results on the extent of support received from a particular source are mixed and inconclusive. Orpen (1996) confirms that outside social support from friends and family members, but not from peers, moderated the negative effects on test anxiety and thus examination results of students. Interesting findings were obtained from Smith and Renk's (2007) study where parental support was not significantly related to academic-related stress;.

Finance: The results of prior studies suggest that financial burdens could be a potential stress factor for college students which contribute to low academic performance (Andrews and Wilding, 2004; Cheng, Leong & Geist 1993; Kariv and Heiman, 2005; Tyrrell, 1992). Pfeiffer (2001) highlights that there are many students who have to work while they are attending college in order to pay for their fees. There are many times when students have to work late at night and then do not have the time to study. This can be hazardous for students as worrying about their financial issues and grades can be an immense stressor in their academic life.

Problems with Roommate: The academic motivation given by a student's roommate to the student has been shown to have a positive impact on that student's academic achievement (Blai, 1972). In fact, students who are more successful academically may create less stress for their

roommates and, thus, allow them to perform better (Ryan, 2004). Based on the review of literature, very little research has been conducted to ascertain whether problem with roommate is another factor contributing to stress and its effect on the academic performance among the college students.

Academic factors: Academic problems have been reported to be the most common source of stress for students (Aldwin and Greenberger, 1987; Blumberg and Flaherty, 1985; Clark and Rieker, 1986; Evans and Fitzgibbon, 1992; Felsten and Wilcox, 1992; Kohn and Frazer, 1986; Mallinckrodt, 1988,; Struthers, Perry & Mense 2000). Schafer (1996) asked college students about their most stressful daily hassles. He observed that the most irritating daily hassles were usually school-related stressors such as constant pressure of studying, too little time, writing term papers, taking tests, plans, and boring instructors.

Among the stressors, test or exam anxiety is one of the main causes of academic stress and most students seem to be more emotionally vulnerable to examination (Fisher, 1994). Another frequently reported source of stress that most college students experience is receiving a lower grade than they expected (Evans and Fitzgibbon, 1992; Kohn and Frazer, 1986; Mallinckrodt et al., 1989; Ratana, 2003). Students have the fear of failure in relation to their grades and academic work. To fall short of their own or others' expectations in school, job, athletics, or any other activity, one risks both external and internal costs: threat to academic or career prospects, disapproval, rejection, humiliation, guilt and blow to the self-esteem (Schafer, 1996). Stress associated with academic activities has been linked to various negative outcomes such as poor health (Greenberg, 1981; Lesko and Summerfield, 1989), depression (Aldwin and Greenberger, 1987), and therefore poor academic performance (Clark and Rieker, 1986; Linn and Zeppa, 1984). For example, Lesko and Summerfield (1989) found a significant positive correlation between the incidence of illness and the number of examination and assignments. Similarly, Aldwin and Greenberger (1987) found that perceived academic stress was related to anxiety and depression in

college students. Nevertheless, while too much stress can interfere with a student's preparation, concentration, and subsequently performance, positive stress can be helpful to students by motivating them to peak performance(Pfeiffer, 2001).

2.2 Sources of Students' Stress

The potential causes of stress are numerous and highly individualistic (Nnoli, 2008). What an individual considers stressful depends on many factors which include his personality, general outlook on life, problem-solving abilities, and social support system (Jaffe-Gill, Smith, Larson and Segal, 2007). Also what determines whether something will be a stressor depends a great deal on its importance and the amount of perceived controllability (Aamodt, 2007). Further review of literature on the sources of stress among the students reveals that secondary school students might experience stress due to multitude of factors, such as:

- Health factors (Ryan, 2004).
- 2. Nutritional routines (Trochel., Barnes, and Egget,(2000).
- 3. Academic factors (Duckworth and Seligman, 2006)
- Social factors in form of family and social support (Hudson and O' Regan, 1994)
- Finance (Hudson and O'Regan, 1994)
- Problems with roommates (Ryan, 2004).

Kai-wen (2010) in his study on stress sources among college students in Taiwan identified the following sources:

- Physical stress
- School factor stress
- Relationship stress
- Family stress

Physical Factor: Adolescents are mostly concerned about their physical appearances than about other aspects. This is more peculiar with girls than boys and as such girls may feel upset perfectionist and comparing self with others, and self- degradation may all cause stress and result in depression.

School Factor: Some of the situations in the school that could cause stress for students include: too much homework, unsatisfactory academic performance, preparation for test/examination, lack of interest in a particular subject. According to Roberts and White (1989) academic work may reflect some of the high level of stress that college students have reported. Some of them experience grade pressures that cause students to have problem with stress. Too much stress can interfere with a student's preparation, concentration and performance. One of the main cause of academic stress is test anxiety.

Relationship factor: Many students at this level of development are pre-occupied with the development of relationship with opposite sex. They want to belong and be accepted by their peers. Making new friends is another source of stress for college students. Giving up or changing new friendships and developing new ones is often a stressful activity associated with college life (Greenberg, 1996).

Family factor: The family can also be a source of stress for secondary school students. Some families place a great deal of stress on students by telling them that they need to acquire good grades. In addition, families with constant conflicts are characterized by a lack of parent-child communication and shallow understanding of each other's expectation.

2.3 Concept of Cognitive Restructuring

Cognitive restructuring was first developed as a part of Cognitive Behavioural Therapy for depression (in Dr. Beck's version) and as a part of Rational Emotive Behavioural Therapy (in Dr. Ellis' version). It is a very powerful therapy technique which has been adapted to help

people cope with all manner of stressful events and conditions. Cognitive restructuring teaches us to stop trusting in our automatic tendency to accept the contents of our thoughts as being an accurate assessment of reality. Instead, the goal is to start testing each thought we have for accuracy. Going back to the $A+B=C$ stress equation, where A stands for an activating event, B for a belief, and C for the consequences of our appraisal for our mood. To this equation, we add a fourth letter "D," which stands for Disputing or Debating thoughts, and a fifth letter "E," which stands for Effective replacement thoughts.

In cognitive restructuring, we write down our thoughts (B), the context of the thoughts (A) and the emotional consequence of that chain of events (C). Then, we think carefully about whether our thoughts may have been wrong, or whether we may have unconsciously experienced a cognitive distortion and write down the findings of this analysis (D). When we are clear on what we got wrong, we rephrase or restate our thought in a more accurate, less distorted format as (E).

The first step of cognitive restructuring is to monitor and record A, B, and C events on a thought record or chart containing columns or fields where each component can be recorded separately. It is important to write things down in order to put a handle on them. Thoughts are much easier to manipulate and examine when you have pinned them down on paper.

The next step in restructuring is to look for characteristic patterns of cognitive distortions or dysfunctional beliefs. Do certain types of situations always tend to trigger certain negative or pressurizing thought patterns? Are you a black and white thinker when it comes to certain topics? Do you typically experience anger or sadness in response to stress? Think carefully about what sorts of thinking mistakes you might be making and write these findings down in your thought record under the Disputing column or field.

When disputing thoughts, it helps to ask yourself the following questions:

- Are my thoughts on the event accurate?
- What objective evidence/facts are there to support my view?
- What alternative views are there of the event?
- Am I underestimating my ability to cope with the event?
- What is the worst that can happen if my view of the event is correct?
- What actions can I take to influence the event?
- What is the worst thing that could happen to me or my family and how does this event compare to that?

After thinking things through for a while, your final task is to restate your original beliefs so that they are more accurate and less distorted. You can do this by literally rewriting your original thought in the Effective Thought column or field of your thought record. Write down new ways of thinking or more helpful beliefs that lead to a new approach to dealing with the activating event. With practice, you will be able to start changing the stress-inducing thoughts that are not helpful, and you will find yourself feeling less pressured and therefore happier.

Cognitive restructuring is not an easy skill to learn. It is difficult to identify and put into words what your thoughts actually are. It is hard to recognize what thought errors you are making. Most people have trouble figuring out a way to restate their thoughts in a manner that does not contain additional thinking errors. Most people really benefit from having a third party available (a therapist) who can critique their efforts and coach them towards success.

It is useful to think of cognitive restructuring as a form of mental weight lifting. By practicing this technique, you are developing mental muscles that formerly were not used. At first the practice will be difficult, effortful, and time consuming. Over time and with repeated practice, it

will become much easier. When people get good at it, they find that they develop the ability to catch themselves in the act of dysfunctional thinking and to correct themselves on the fly in real-time so that they do not get as stressed out.

2.4 Cognitive Restructuring, Social Stress, Gender and Academic Performance

A number of social factors that may contribute to stress among the college or university students have been identified. They include lack of time and/or support for and from family and friends, family commitments, financial difficulties, and problems with college roommates (Linn and Zeppa, 1984; Legault et al., 2006; Orpen, 1996; Vitaliano, et al., 1989; William, 1996). A considerable number of studies have been conducted to examine the effects of parental, family members, friends, academics, and peers support on anxiety and academic performance of college students (Cutrona et al., 1994; DeBerard et al., 2004; Hackett et al., 1992; Lazarus and Folkman, 1984; Mallinckrodt, 1988; Orpen, 1996; Smith and Renk, 2007; William, 1996).

However, the results on the extent of support received from a particular source are mixed and inconclusive. William (1996) found that social support ratings were significant predictors of graduate GPAs after controlling for the different ethnicities in the US. Specifically, Cutrona et al. (1994) reported that the social support of parents predicted college GPA, after controlling for the American College Test (ACT) scores. Hackett et al. (1992) discovered that encouragement from faculty members predicted the academic performance of university students but peer support and academic performance were negatively related. Orpen (1996) confirms that outside social support from friends and family members, but not from peers, moderated the negative effects on test anxiety and thus examination results of students.

Interesting findings were obtained from Smith and Renk's (2007) study where parental support

was not significantly related to academic-related stress; however, it is the level of social support received by the college students from significant others such as their romantic partners (boyfriends or girlfriends) that might be more likely to be an immediate influence in their daily lives. They further stressed that since many of these students are transitioning into adulthood and may be experiencing their first serious romantic relationship, they may become more entrenched with their significant others than they otherwise would, particularly as they experience and make attempts to cope with academic-related stress.

Ahmad and Lama (2012) did a study on assessing stress among university students, Their results showed that gender and social stress are not statistically significant. Mehra and Sharma (2008) studied the effect of Yogic practices on social stress and academic stress of female students. 120 girl students (the mean age range of 16 years old) were selected randomly and assigned into two groups (experimental and control group). Social stress scale (Abha Rani Bisht Battery, 1987) was used to collect the data. The experimental group was exposed to three months yogic practices such as Meditation, Pranayamas, and Shatkhriyas. Results showed that the students exposed to yogic practices experienced reduction in social stress ($t\text{-ratio} = 10.42, p < 0.01$).

Dzulkifli1 and Yasin, (2009) did a research on social support and stress. They found out that there is Correlation coefficient between social support and stress. Social support was found to significantly and negatively correlate with stress. Social support has also been recognized to have significant impact on the achievement of the students. Since family and friends are the individuals' first source of reference, supports from these two sources have been found to give a significant influence on academic achievement and also reduced the stress level of students (Steinberg and Darling, 1994; Cutrona, 1994).

Roslee, Aqeel, and Mohamed (2015) also did a research on Self-Concept and Stress among Junior and Senior School Counsellors: A Comparison Case Study in Secondary Schools in Malacca. They worked on social self -stress, the mean scores for male counsellors ($M = 41.75$) and female counsellors ($M = 40.50$) shows that the mean value for the social self in male counsellors is higher than in female counsellors. The t-test results for social self ($t = 2.05$, $p < .05$) showed significant differences between male and female counsellors. In other words, male and female counsellors show differences in their social life, including their relationship with family members, friends, school administrators, students, and others. The higher mean score for male counsellors show that they perceive themselves as being loved, favoured, and able to easily mix and interact with others more than female counsellors, who tend to focus on emotions or feelings while socializing with others.

Mehra and Sharma (2008) studied the effect of Yogic practices on social stress and academic stress of female students. 120 girl students (the mean age range of 16 years old) were selected randomly and assigned into two groups (experimental and control group). Social stress scale (Abha Rani Bisht Battery 1987) was used to collect the data. The experimental group was exposed to three months yogic practices such as Meditation, Pranayamas, and Shatkriyas. Results showed that the students who were exposed to yogic practices experienced reduction in social stress ($t\text{-ratio} = 10.42$, $p < 0.01$). Dzulkifli and Yasin (2009) also did a research on social support and found out that there is Correlation coefficient between social support and stress. Social support was found to significantly and negatively correlate with stress. Social support has also been recognized to have significant impact on the achievement of the students. The support received by the students could help to decrease their psychological problems since they feel that someone is there to help them, thus helping them to perform well in academic life. A considerable number of studies have been conducted to examine the effects of parental, family

members, friends, academics, and peers support on anxiety and academic performance of college students (Cutrona et al., 1994; DeBerard et al., 2004; Hackett et al., 1992; Lazarus and Folkman, 1984; Mallinckrodt, 1988; Orpen, 1996; Smith and Renk, 2007; William, 1996).

However, the results on the extent of support received from a particular source are mixed and inconclusive. William (1996) found that social support ratings were significant predictors of graduate GPAs after controlling for the different ethnicities in the US. Specifically, Cutrona et al. (1994) reported that the support from parents predicted college GPA, after controlling for the American College Test (ACT) scores. Hackett et al. (1992) discovered that encouragement from faculty members predicted the academic performance of university students but peer support and academic performance were negatively related. Orpen (1996) confirms that outside support from friends and family members, but not from peers, moderated the negative effects on test anxiety and thus examination results of students. Interesting findings were obtained from Smith and Renk's (2007) study where parental support was not significantly related to academic-related stress.

2.5 Cognitive Restructuring, Physical Stress, Gender and Academic Performance

Rajni and Radhakata (2012) did a study on relationship between stress and academic achievement. Their results indicate that there is no significant difference between physical stress and academic performance among male and female students. Roslee, Aqeel, and Mohamed (2015) also did a research on Self-Concept and Stress among Junior and Senior School Counsellors: A Comparison Case Study in Secondary Schools in Malacca. In the self-concept subscale of physical self- stress, the mean scores are very similar between male counsellors ($M = 38.11$) and female counsellors ($M = 38.38$), which shows that the mean value for the physical self in female counsellors is slightly higher than for male counsellors.

The results for physical self-stress showed no significant difference between male and female counsellors. This result shows that female counsellors are not limited by their physical condition and are able to perform outdoor activities with clients. This means that female counsellors were prepared to conduct outdoor activities such as mountain climbing with their clients, to spend the night in a tent, and take their sick clients to the hospital like their male counterparts. Female counsellors work with full dedication and an optimum workload, which is meaningful to their lives. Similarly, Pilcher and Walter (1997) found a negative effect of sleep deprivation on the cognitive performance of college students.

Lack (1986) did a study on delayed sleep and sleep lost in university and reports indicated that sleeping habits accounted for the largest amount of variance in the GPA of students (Lack, 1986) while Kelly et al. (2001) “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 slept seven or eight hours; and 3) long sleepers, individuals who slept nine or more hours out of twenty-four. The study found that people who were considered long sleepers reported higher GPAs. This is because people who sleep fewer hours at night may have psychological maladjustment and this increases their anxiety and stress, which has been associated with poorer academic performance. These factors cause problems to students such as shortened attention span and increasing the number of errors students make on tests.

Similarly, the study from Kamarudin, Aris, Mohd, Siong, Mohamed and Ibrahim.(2009) collaborated with other findings by reporting that majority of students who do not get enough sleep had academic and nutritional problems throughout the semester among male and female students. Ahmad and Lama (2012) did a research on Assessing Stress among University

Students and found out that physical stress such as back pain, feeling tired regularly contributed towards poor academic performance among male and female students.

2.6 Cognitive Restructuring, Academic stress, Gender and Academic Performance

Academic stress is mental distress with respect to some anticipated frustration associated with academic failure or even unawareness to the possibility of such failure (Smritikana, 2016). Students have to face many academic demands, for example, school examination, answering questions in the class, showing progress in school subjects, understanding what the teacher is teaching, competing with other class mates, fulfilling teachers and parents academic expectations. These demands may exceed available resources of the students. As a consequence, they can be under stress, since the demand is related to achievement of an academic goal. Bisht (1980) has defined academic stress as a demand related to academics that tax or exceed the available resources (internal or external) as cognitively appeared by the student involved. According to her, academic stress reflects perception of individual's academic frustration, academic conflict, academic pressure and academic anxiety. She gave the definition of four components of academic stress as follows:

Academic Frustration: - Academic frustration is a state caused by harm of some academic goals.

Academic Conflict: - Academic Conflict is the result of two or more incompatible response tendencies to academic goals.

Academic Pressure: - When the student is under heavy demands of time and energy to meet academic goals.

Academic Anxiety: - Apprehension of harm to some academic goals.

Academic Stress is an important factor accounting for variation in academic performance. It also contributes to major mental health hazards, problems both physical and mental stress related

diseases. Stress makes a significant contribution to the prediction of subsequent school performance and act as a negative predictor of academic performance in school children (Hussain, Kumar, and Husain ,2008).

Academic Stress is a mental stress with respect to some anticipated frustration associated with academic failure or even an awareness of possibility of such behaviour (Gupta and Khan, 1987). Academic stress is often the result of the combination of the demands a youngster places on himself or his ability (or 'perceived' ability) and the pressures that come from outside sources such as family, friends or school. The pressure one place on himself is the most significant as there is often a discrepancy between what one thinks he ought to be doing and what he actually does. Smritikana (2016) sees academic stress as mental distress with respect to some anticipated frustration associated with academic failure or even unawareness of the possibility of such failure.

Attri and Neelam (2013) have attempted to find out the significant difference between the academic stress and academic achievement of secondary school students. It was hypothesized that there exists a significant difference in academic anxiety and academic achievement of male and female secondary school students. For verification of these hypotheses, the data was collected from 200 secondary school students of Mandi district of Himachal Pradesh by adopting lottery method of random sampling by administering Academic Anxiety Scale for Children (AASC) and their marks of class 9th were taken as academic achievement. The statistical technique used was t - test. The findings of the present study revealed that there exists significant difference in academic anxiety and academic achievement of male and female secondary school students. Girls were found to be more academically anxious and had better academic achievement than boys.

Sharma, Shrivastava, Malhsharma, Maithotra, Singh & Singh(2010) examined the effectiveness of cognitive behavioural techniques on high school students' academic stress (30 boys and 30 girls), (aged between 13 to 16 years) for a period of three months, five days a week, and found out that there is a decrease in high school students' academic stress which enhanced their mental well-being. They suggested that while the academic stress of the students of experimental group decreased significantly, it promotes a significant enhancement in wellbeing. Ogugua, (2010) did a study on Effects of Cognitive Restructuring on Mathematics Achievement of Secondary School Adolescent. The result of the analysis of data score indicates that, Cognitive Restructuring was very effective in enhancing students' achievement in mathematics. The result of the study is in agreement with the findings of Dossey and Usiskin (2000) who contended that cognitive restructuring if effectively adopted would to a large extent lead to students' high mathematics achievement. The present finding also agrees with Dattilio and Montano (2005) whoasserted that, counsellors have used cognitive restructuring for many years and the value seems widely accepted.

Khanehkeshi (2014) did a research on effectiveness of cognitive behaviour therapy on academic stress among high school students. Results showed that the effectsof interventions in decreasing academic stress and its subscales were statistically significant, that there was a significant difference between two groups in academic stress in post treatment, that the interaction of time/group in relation to the efficacy of CBT interventions in decreasing academic stress was significant. But, gender and grades had no significant effect on academic stress. As a conclusion, findings demonstrate the efficacy of CBT in alleviating academic stress symptoms among high school students.

However, Smritikana (2016) did a study on academic stress among government and private

High School Students. The study comprised 200 high school students from different schools of Ranchi town. One hundred students were government's high school (male and female) and one hundred were private high school (male and female). Tools: Bisht battery of stress scales developed by Bisht (1980) was used to collect data. From the findings, female students experienced more academic stress than their male counterparts. Female students were found to be under more academic stress as compared to their male counterparts. This may be due to the fact that females are sensitive and sincere by nature and take everything very seriously whereas males are generally easy going and happy go lucky.

In line with these findings, Akande, Olowonirejuaro and Okwara-Kalu, (2014) did a study on the level and sources of stress among secondary school students. The results of hypotheses testing indicate a significant gender difference in the level of stress among secondary school students. The female students tend to experience more stress than the male students. This could be attributed to the nature of females who are generally more emotional than males. Bartwal and Raj (2014) also did a research on Academic stress among school going adolescents in relation to their social intelligence. Their results observed no significant gender differences with regard to academic stress and social intelligence among rural and urban adolescents. Mathew and Jayan (2006) did a study on Academic stress and coping styles among plus-two students. Their result found no difference between boys and the girls of the age group of 15-17 years with respect to their Academic stress. Both experienced more or less similar level of academic stress and employed similar kinds of coping styles.

2.7 Gender Difference and Stress

Smritikana (2016) did a study on academic stress among government and private high school students. From his findings, female students experienced more academic stress than their male

counterparts. Female students were found to be under more academic stress as compared to their male counterparts. This may be due to the fact that females are sensitive and sincere by nature and take everything very seriously whereas males are generally easy going and 'happy go lucky'. In line with these findings, Akande, Olowonirejuaro, and Okwara – Kalu , (2014) did a study on level and sources of stress among Secondary School students. The results indicted a significant gender difference in the level of stress among secondary school students. The female students tend to experience more stress than the male students. This could be attributed to the nature of female who are generally more emotional than males.

Rajni and Radhakata (2012) did a study on relationship between stress and academic achievement. Their results indicated that there is significant relationship between stress and academic performance among students. However, Rajni and Radhakata (2012) also did a study on relationship between stress and academic achievement of male and female secondary school student. They found out that there is no significant gender difference in stress and academic achievement of Senior Secondary School students. This means gender difference did not mediate Senior Secondary School students' stress and academic achievement. The academic workload requires that students face a series of peak periods such as finals, there is a relatively constant underlying pressure to complete an upcoming assignment".

It could also be because male students were lower in stress as compared to their female counterparts. Misra and McKean (2000) conducted a study surveying 249 college students at a Midwestern university. The study showed that while female students managed their time more effectively than male students, they also experienced the highest levels of stress and anxiety.

Rajni and Radhakanta (2012) did a study on relationship between stress and academic achievement of male and female secondary school student. They found out that there is no

significant gender difference in stress and academic achievement of senior secondary school students. This means gender difference did not mediate senior secondary school students' stress and academic achievement. The finding of the present study is in congruence with finding of the study conducted by Eweniyi (2009), where he reported an insignificant gender difference in the stress level and academic achievement of Nigerian undergraduate students. This suggests that whether one is a male or female, the way the individual feels stress has no bearing on his or her academic achievement.

However, Affum – Osei, Asante and Forkuoh(2014) did a research on the profile of Senior High School Students' perceived stress with respect to gender. The study found out that female students were moderately stressed compared to their male counterparts. The difference may be as a result of environmental factors and academic workload as suggested by Hudd, Dumlao, Erdmann, Murray, Phan, Soukas, and Yokozuka, (2000). The academic workload requires that students face a series of peak periods such as finals, there is a relatively constant underlying pressure to complete an upcoming assignment". It could also because male students were lower in stress as compared to their female counterparts. Males are more interested in reading science programmes in Ghana as compared to female and mathematics as a course work is compulsory for science student (Affum-Osei, Asante and Forkuoh 2014).

Matud (2004) did a study on Gender differences in stress and coping styles, Personality and Individual Differences. He sampled 2816 people (1566 women and 1250 men) between 18 and 65 years old, with different socio-demographic characteristics. The results of MANCOVA, after adjusting for socio-demographic variables, indicated that the women scored significantly higher than the men in chronic stress and minor daily stressors. Although there was no difference in the number of life events experienced in the previous two years, the women rated their life events as

more negative and less controllable than the men. Furthermore, the study also found out that gender differences in 14 of the 31 items listed, with the women listing family and health-related events more frequently than the men, whereas the men listed relationship, finance and work-related events. The women scored significantly higher than the men on the emotional and avoidance coping styles and lower on rational and detachment coping. The men were found to have more emotional inhibition than the women. And the women scored significantly higher than the men on somatic symptoms and psychological distress. Although the effect sizes are low, the results of this study suggest that women suffer more stress than men and their coping style is more emotion-focused than that of men.

Additionally, a study conducted by Hembree (1990) integrated the research and findings regarding mathematics anxiety and its nature. The results revealed that there is a gender difference in regards to mathematic anxiety. Regardless of grade, all female students had higher math anxiety measures than the males did. Hembree (1990) concluded that this could be because either females are more willing to admit their anxiety or because females have better coping mechanisms for their anxiety (Hembree, 1990). An additional study was conducted by Maloney et al. (2012). This study further examined the reason for the difference in mathematics anxiety between males and females. The results revealed that math anxiety is negatively correlated with spatial processing ability, suggesting that women may experience more math anxiety than men because they are worse than men at spatial processing (Maloney et al., 2012).

2.8 Stress Level and Academic Performance

Keun, and Myeong (2015), did a study on the relationship between the stress from learning English and Defence mechanism of Elementary school in Daejeon, South Korea. The results showed that comparison of the academic achievement of the two groups revealed a significant

difference based on level of stress. In particular, the students in the low-stress group gained higher scores in English achievement than those in the high-stress group. Koo (2011) also supported this finding by saying that students with a low level of stress from learning English achieved high scores, while those with a high level of stress achieve low English test scores.

However, Affum-Osei, Asante and Forkuoh (2014) did a research on the profile of Senior High School Students' perceived stress in western region of Ghana. Their study indicated that there is no significant difference between the level of perceived stress and academic performance of students in Mathematics. Rajni and Radhakanta (2012) did a study on relationship between stress and academic achievement of Senior Secondary School students and found that significant difference exists in the academic achievement of students having high, moderate and less stress. Students with high and moderate stress performed better than the students having less stress. The result of the study also indicated that there is a significant difference in the academic achievement of highly, moderately and less stressed students. Students with high and moderate level of stress have higher academic achievement than students with low levels of stress.

Harlina, Salam, Roslan, Hasan, Jin, and Othman (2014) did a study on Stress and Its Association with the Academic Performance of Undergraduate Fourth Year Medical Students at University Kebangsaan Malaysia. Their findings revealed that respondents with a high and severe stress level were observed to have higher CGPA than those with moderate and less stress.

In general, it is a common fact that life of a medical student or health profession is stressful. Mild, moderate, high or severe level of stress had been reported among the medical and health students. The stress level among the students of this study was found higher. Majorities (53%) were in high level stress (2.01-3.00) and 39% were in severe level (3.01-4.00). In India the stress level was found as high as 89.64%.

Similarly, Muhamad, Ahmad and Yaacob (2009) had reported a high prevalence of stress in medical students, ranging from 30% to 50%. Medical students are expected to learn and master a huge amount of knowledge, attitudes and skills for which they have to work hard which in turn put them under a lot of stress. This finding has some similarity with Rafidah, Azizah, Norzaidi, Chong, Salwani, and Noraini (2009), where they found that students of moderate degree stress have more satisfactory GPAs. They reported that the moderate stress experienced by the students is desirable for attaining good academic performance. Sanders and Lushington (2002), explained in their study that stress have negative impact on academic performance, but it was poorly related. Elias et al., also found that there was a significant, but weak and negative relationship between stress and academic achievement. Most importantly, the medical students who can manage the stress level well are associated with higher academic performance.

Ross, Niebling and Heckert. (1999) emphasized the fact that stress levels varied based on the year of study. The first year students were more prone to greater stress compared to students of other years of study. This resulted from the absence of a social support framework and the transitional nature of college life that requires adjustment to the new environment amidst new responsibilities and challenges. At times, the first year students are leaving home for the very first time and therefore need to adjust to the newfound freedom as well as maintain a high level of academic performance (Robotham, 2008). On the other hand, Shaikh, Kahloon, Kazmi, Khalid, Nawaz, Khan & Khan (2004) found that senior students experienced higher levels of stress that is 95% and 98% for fourth and final year students respectively due to the academic demands like having supervised clinical rotation. Furthermore, that final year students are required to write their research dissertations that exposes them to additional stress.

In addition to stress levels varying across the year of study, Misra and McKean's (2000) research findings suggest that stress levels vary by gender of the students. Levels of academic related stress differed among male and female students with female students being more prone to more academic stress than their male counterparts (Abouserie, 1994; Bang, 2009; Misra and McKean, 2000; Rayle and Chung, 2008). Females experienced higher levels of academic stress because of negative appraisals of the stressful event and focus on the emotional challenges in the wake of the stressful event. Male students are trained to display strength and machismo in the face of challenges right from their young age (Misra and McKean, 2000). However, female students performed better than the male students and had better GPAs than male students even in case of significant stress (Talib and Zia-ur-Rehman, 2012).

Affum-Osei, Asante, and Furkuoh (2014) did a study on Perceived stress and academic performance of senior high school students in Western Region, Ghana. The study finds out the profile and the relationship between Senior High School Students' perceived stress and academic performance. A total of 120 Senior High School Students randomly selected from four Senior High Schools in the Western Region of Ghana participated in the study. Results showed that, majority of the students experienced moderate stress levels and that, none of the students experienced high stress levels. The study also indicated that, there is no significant correlation between the level of perceived stress and academic performance of the students. The student generally experienced moderate stress levels and stress did not significantly affect academic performance. The difference may be as a result of environmental factors and academic workload as suggested by Hudd, Dumlao, Erdmann, Murray, Phan, Soukas, and Yokozuka, 2000. The academic workload requires that students face a series of peak periods such as finals, there is a relatively constant underlying pressure to complete an upcoming assignment.

Kranz (2008) study was used to evaluate stress levels experienced by students in a pharmacy curriculum. Data were collected using an individual interview that consisted of both a demographic and stress questionnaire. The results indicated that students rated stress to be average to above average, with a mean score of 3.8 out of 5, with regard to approaches used to manage stress, (70.5%) reported some form of active approach such as exercising, playing basketball or swimming. Wong, Cheung, Chan and Tang (2006) conducted a web-based survey of depression, anxiety and stress in first year tertiary education students in Hong Kong, the results indicated that (27.5%) of the sample (7915 students) had a moderate severity or above of depression, anxiety and stress.

Reports showed that some at risk students experienced high level of anxiety and it had an impact on test performance (Kocher, 2008). The result of the present work confirms similar observation as reported among freshmen university students who showed moderate mathematics level of anxiety (Beleta, 2008). An investigation on the effect of test anxiety to the academic performance revealed that the students with low test anxiety perform less compared to those students with moderate level of test anxiety (Vogel and Collins, 2004).

Lama Al-Qaisy (2011) did a study on the relation of depression and anxiety in academic achievement among group of university students. Results of this study indicate that there is a negative relationship between depression and academic achievement of students at the university, and this indicates that the higher the depression among students, the lower their level of achievement. Simonds and Whiffen (2003) support this result. Also, the study indicates that there is a positive relationship between anxiety and academic achievement of students, and this suggests that whenever the students have a medium level of concern, the higher their academic achievement will be.

Kamarudin; Aris; Mohd; Siong; Mohamed, and Ibrahim, (2009) did a study on the impact of perceived Stress and Stress Factors on Academic Performance of Pre-Diploma Science Students in Malaysian. Their findings suggest that there is no correlation between the level of perceived stress at the beginning and middle semester with the students' academic performance. The results correlate with Womble's (2003) study where students' stress does not significantly correlate with their GPAs. This finding is not surprising, given the fact that these students are normally school leavers and they are used to the school system where terms are used and only final exams are counted. As they enter tertiary education institution, they still cannot see how the quizzes, tests, assignments held in between of the semester contribute to their overall grades. They still think that final exams are the most important criteria that make up their grades. However, there is a significant correlation between the level of perceived stress at the end of semester and the students' academic performance. The rho value was -0.206 which implied that when the level of perceived stress is higher, the academic performance is lower. However, it is important to note that the correlation was rather weak. The implication is that the stress level they experienced is not that high to the extent that they could not cope with their academic activities. Hence, it was not surprising that more than half (66.20 percent) of them scored GPA 3.00 and above and that 24 percent of them achieved Deans List with GPA 3.5 and above.

2.9 Concepts and Nature of Mathematics

Mathematics is a vital tool for the understanding and application of science and technology. This discipline plays the vital role for national development, which has become an imperative in the developing nations of the world (Bassey, Joshua and Asim, 2008). In realization of the significant role of Mathematics to nation building, the government of the Federal Republic of Nigeria made the subject compulsory at the basic and secondary levels. This was aimed at ensuring the inculcation of Mathematics literacy with logical and abstract thinking, needed for

living problem solving and educational furtherance. Tobias and Ernest (1998) opined that many people regard Mathematicians as Magicians possessed by supernatural powers. Although this is very flattering for successful Mathematicians, it is yet very bad for those who for one reason or the other are attempting to learn the subject. Many students feel that they will never be able to understand Mathematics and they prefer not to attend Mathematics lesson at all because of their belief that it is a dreadful subject. It is extremely very bad for human beings to acquire the habit of cowardice in any field. The ideal mental health is to be ready to face any challenge which life may bring.

In today's high and ever increasing technology-world, it is important that students, right from childhood, develop ability to do Mathematics so that when they grow up they would not have any fears about the subject. This is particularly important because Mathematics has helped in solving problems, and has made students to be creative (Adebule, 2002). The nature of Mathematics has been the focus of much writing over the last few decades (Begg, 1994; Dossey, 1992; Presmeg, 2002; Winter, 2001).

Dossey (1992) argues that different conceptions of Mathematics influence the ways in which society views Mathematics. This can influence the teaching of Mathematics, and communicate subtle messages to children about the nature of Mathematics that "affect the way they grow to view Mathematics and its role in the world". Similarly, Presmeg (2002) argued that beliefs about the nature of Mathematics either enable or constrain "the bridging process between everyday practices and school Mathematics".

Different dichotomies have been used to highlight the contrasting ways in which Mathematics is viewed. Dossey (1992) distinguished between external conceptions of Mathematics held by

those who believe that Mathematics is a fixed body of knowledge that is presented to students, and internal conceptions that view Mathematics as personally constructed, internal knowledge. Begg (1994) contrasted Mathematical content (knowledge and procedures) with Mathematical processes (reasoning, problem-solving, communicating and making connections).

The view of Winter (2001) was about a tension between a mechanistic view of Mathematics (as in the development of skills and knowledge), and Mathematics as a means towards fostering citizenship and responsibility within society (the development of personal, spiritual, moral, social and cultural dimensions). A distinction has been made between Mathematical activity carried out for its own sake and Mathematical activity that is useful for something else (Huckstep, 2000). In order to distinguish between the aims and purpose of Mathematics education, Huckstep (2000) asks: What are we trying to do in Mathematics education?" and "What are we trying to do it for?"

This particular dichotomy is closely related to the debate about what is Mathematics and what is numeracy (Hogan, 2002; Stoessiger, 2002). Definition of numeracy emphasizes the practical or everyday uses of Mathematics in contexts such as homes, workplaces and communities (Stoessiger, 2002). Odili (1990) defines Mathematics as a science precise in method and faultless in logic and that if a person is exposed to it systematically for a sufficient time usually through a course of study, he is bound to be influenced by its contents, method, logic and procedures.

Umoinyang (2007) viewed Mathematics as the foundation of science and technology without which a nation can never be prosperous and economically independent. He further noted that competence in Mathematics provide many opportunities for career choice and production of

highly defined personnel required by industry, technology and science. Watson (2005) also revealed that the relevance of Mathematics in the development of manpower in social science cannot be overstressed because it is needed in econometrics for the establishment of economics models as powerful statistical techniques that could be used by business analysts. Furthermore, Armstrong (2006) found that Mathematics concepts such as sets, inequalities, matrix functions, series, progression statistics and calculus are useful in other areas of social science such as business.

This view was supported by Olayinka and Omoegun (1998), who opined that Mathematics is the core of all science subjects, for there is nothing we do that does not have, at least, an element of Mathematics. It is applicable to everyday living whether in the market, schools or at home. It also helps to develop the deductive thinking of a student, thereby encouraging curiosity and innovation. Abe (1998) has reported that Mathematics books might be influential in shaping pupils' attitude toward the learning, understanding and better performance in Mathematics.

Ojerinde (1999), on his part, defined Mathematics as the communication system for those concepts of space, shapes, sizes, quantity, and others used to describe diverse phenomena, both in physical and economic situations. Saxe (1991) and Scribner (1984) in their study found out that an individual's Mathematics ability is significantly influenced by his participation in encompassing cultural practices such as going shopping, completing worksheets in class, and selling lemonade in the street. Crawford (1980), in his study found out that student's lack of success in Mathematics might be caused by poor Mathematics instruction, insufficient number of Mathematics courses, unintelligible textbooks and misinformation about what Mathematics was and what it was not.

2.10 Mathematics Curriculum in Nigeria

There are new trends and developments in mathematics education relevant to our education efforts in this period of rapid expansion. Some of these are partly responsible for the philosophy behind the mathematics curricular. In a nutshell, the curricular were based on the objective of Mathematics education set out in the National Policy on Education, the categories of students that will be utilizing Mathematics for various purposes (utilitarian values) and other values such as cultural and disciplinary issues.

Kalejaiye (1985) felt that the content of the primary school syllabus is so wide that an average child cannot cover it in six years. He advocated for narrowing down of the syllabus to ensure that the primary school pupils develop favourable interest towards Mathematics. He attributed failure in Secondary schools to the following reasons: The content of the Secondary syllabus is a bit wide and cannot be covered by an average Mathematics teacher teaching average students, Poor teaching of Mathematics sometimes due to poor knowledge on the part of the Mathematics teacher and unfavourable attitude displayed by students caused by environmental influences.

2.11 The Usefulness of Mathematics in Secondary School Curriculum

The education of children and youths always takes place in a particular society because it serves the need of the society. It is evident that any consideration of acceptance of any subject in school curriculum should take cognizance of the goals of education in that society. The Nigerian National Curriculum Conference (1969) had observed that the socio-economic development of the previous decade indicated a general progress but secondary education must remain a terminal education for majority. Mathematics is very useful in school curriculum with the following reasons:

1. Mathematics as a Science of Numbers and Measurement

The concept of Mathematics (number) is as old as man himself, but numeric symbol developed when it became necessary for man to keep records of the numbers of his belongings, or of objects around him or to solve some daily problems (Sule and Aiyedun, 2006).

Examples:

1. The set of counting or natural numbers, $N = (1, 2, 3 \dots)$ developed to enable the ancient Indians and the Arabs to count and keep records of their sheep and other objects.
2. The set of the whole numbers, $W = (0, 1, 2, 3 \dots)$ became necessary to enable the ancient Indians measure whole units

2.12 English Language Curriculum in Nigeria

English language is the language of Education in Nigeria because it is the only language used for teachings and instructions in all the school subjects or courses except when teaching local languages in Nigeria. Apart from the first three years of a child's life in the primary school that was mentioned in the National Policy on Education, the rest of the child's life in the primary, secondary and tertiary institutions, all academic activities must be done in English language. English is the language of prestige per excellence and a firm knowledge of it is an assurance of climbing the educational ladder of success in Nigeria. For a student to be admitted into the University or any institution of higher learning in Nigeria, it is compulsory that he or she must obtain a credit pass in English Language and subsequently it offers a speedy access to employment in the job market.

Economically, English language is the avenue to sustainable development in Nigeria. Economists in Nigeria believe that English is crucial for economic growth, as it helps them trade more widely on an international scale. Nigeria can do international businesses because we have

English as our official language. The international community can easily and comfortably be reached because of the prestigious language. English is very important when hiring a new employee. This underlines the fact that English language skills enhance business and trade, while also improving an individual's economic conditions. An individual's economic empowerment in Nigeria is closely linked with good command of English.

A wide range of business categories in Nigeria including the banking industry, technology, the pharmaceutical industry, and even vocational workers such as carpenters and electricians see increased need for English language skills. A salaried professional with good English language skills can earn an average of thirty percent (30%) more than someone with no English language skills in Nigeria. The government of Nigeria firmly recognizes that English is a key element of business communication and it is essential for attracting new investments.

With government and companies pushing for far more English speaking workers, it can be expected that more individuals will view English, among other skills, as a step towards career advancement and higher pay. This is a motivating factor for individuals to learn English in order to obtain well-paid jobs within the most dynamic organizations and industries in Nigeria. Clearly, we all can see that prospective employees who can speak and write English well have better opportunities economically. This way, English language is a tool for sustained national development.

2.13 Appraisal of Literature Review

This study is focused on exploring the effect of Cognitive Restructuring on stress factors and academic performance among Senior Secondary School students in Ogun State, Nigeria. In this chapter, relevant literature was reviewed. The reviewed literature shows that stress is a

psychological and physical reaction to certain life events or situations in a way that the individual is forced to deviate from normal functioning concepts (EzeiloandChukwu, 1994). If these physical reactions occur for a period longer than our body can tolerate, negative physical and psychological consequences can occur and these consequences are called strains (Greenberg, 1996). These strains could result in poor performance, forgetfulness, tiredness, inadequate memory storage, to mention but a few. Also the literature highlighted some sources of stress among secondary school students, such as health, nutritional routines, academics, social, finance, problems with roommates, and so on, which if not well-managed can affect students' academic performance.

Furthermore, the literature showed that cognitive behavioural therapy on students' academic stress for an adequate period of time can reduce students' academic stress, enhance their mental well-being and improve academic performance in English Language and Mathematics (Ogugua, 2010). The literature review also revealed that stress and academic achievement of male and female secondary school students were well-related (Akande, OlowonirejuaroandOkwara-Kalu, 2014) and that there was no difference in the stress reactions and academic achievements among male and female Senior Secondary School students (Bartwal and Raj, 2014). The literature reviewed, therefore, suggests that male and female students who encountered stress before being exposed to treatment can ameliorate their reactions to them and change their negative thoughts about English Language and Mathematics to positive thoughts without any gender-related issues. The literature reviewed revealed the gap in knowledge to be that lower stress enhances students' academic performance in English Language while higher and moderate stress enhance performance in Mathematics; hence the need for this study. To the knowledge of the researcher, there seems to be a gap in research on the effect of stress on students' academic performance using Cognitive Restructuring Therapy; therefore, introduced as a counselling strategy to

manage stress and change students' maladaptive thoughts, feelings and negative thoughts about Mathematics and English Language in order to improve their academic performance.

CHAPTER THREE

METHODOLOGY

This chapter the procedures used in carrying out the study under the following sub-headings: research design, study area, population, sample and sampling technique, instrumentation, validity and reliability, pilot study, procedure for data collection, and method of data analysis.

3.1 Research Design

This study employed the quasi-experimental pre-test/post-test treatment and control group designs. The purpose of the use of quasi-experimental design was appropriate because it involves human behaviour and does not permit complete randomization of subjects and control of all variables (Ilogu, 2005). This study consists of two experimental groups; that is one group was exposed to training instruction and one control group. The treatment group was exposed to cognitive restructuring technique while the second group, which is the control group, did not receive the training.

Variables used in the study

- **Dependent variable:** Academic Performance and stress factor
- **Independent variable:** Experimental conditions–Cognitive Restructuring Strategy (treatment condition) and Treatment expectancy Control group
- **Moderating variable:** Gender

3.2 Area of the Study

The study was carried out in Ogun State. Ogun State is a state in the South-West geo-political zone of Nigeria. It is situated between Latitudes 6.20N and 7.6⁰N, Longitudes 3.00E and 5.0⁰E and covers a total landmass of 16,409.26sqkm. The state has three hundred and one (301) senior secondary schools. Ogun State has four Educational Divisions, twenty Local Government Areas and twenty Educational Zones. Ogun State was selected because it has quite a number of secondary schools, public and private, numerous higher institutions of learning with diversity and unique characteristics. The local language of the people in the state is Yoruba and the capital is Abeokuta (Ogun State Handbook, 2007).

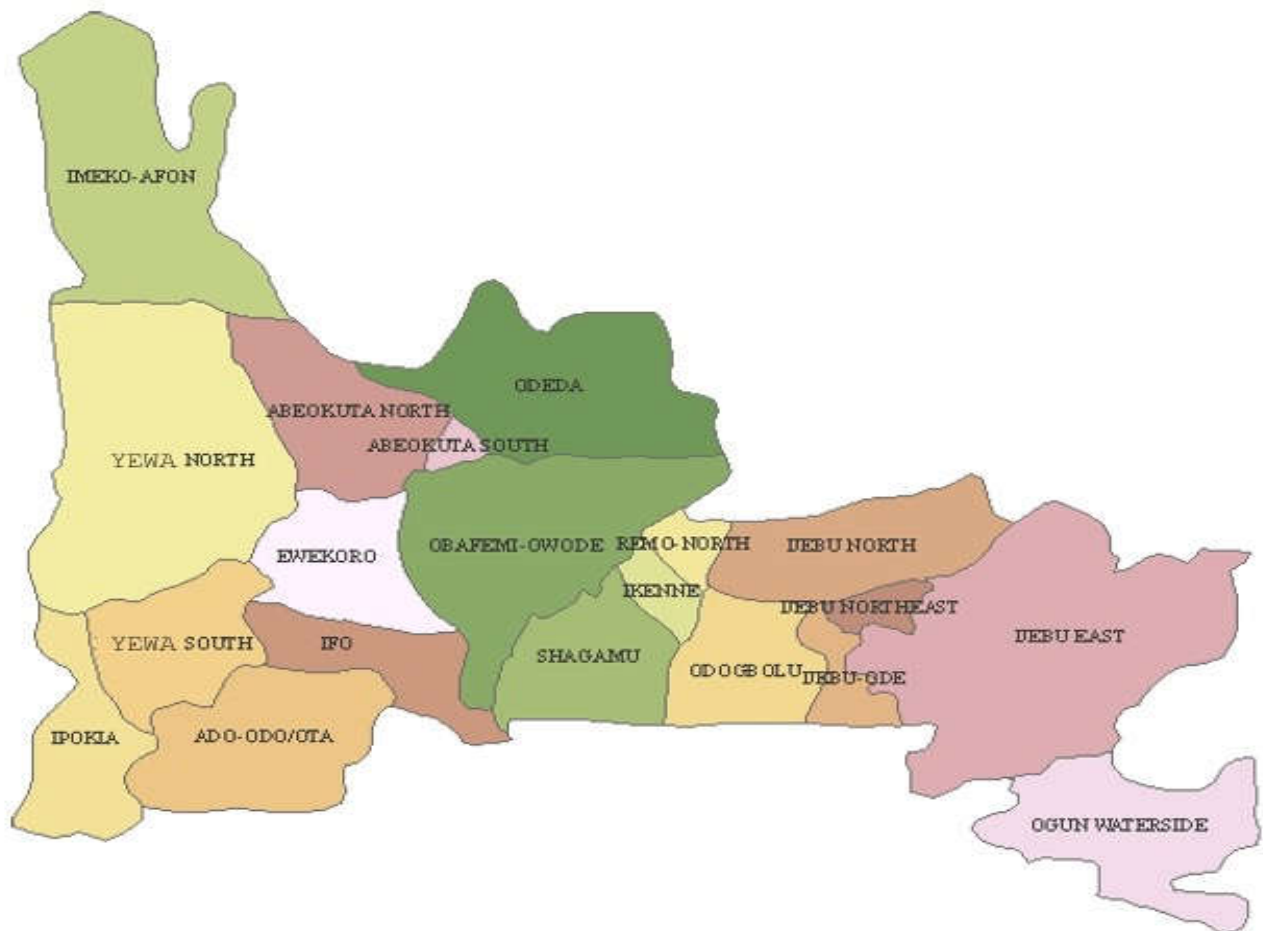


Fig 3: Map of Ogun State showing various local governments in the State

3.3 Population of the Study

The target population for this study comprised all male and female Senior Secondary School students in Ogun State, Nigeria. Specifically, the study comprised all Senior Secondary School two students in Ogun State. The Senior Secondary two (SS2) students were chosen because they were above the fresher's class, that is SS one. Another important reason for selecting SS two class was because the students were not involved in any external examinations as at the time of this study and, therefore, had enough time to participate in the study.

3.4 Sample and Sampling Technique

The study participants comprise one hundred and sixty one SS2 students drawn from four secondary schools in Ijebu-Ode ,Odogbolu and Ijebu-North Local government areas in Ogun State .Simple random sampling technique, through the lucky dip method, was used to select four out of the twenty Educational Zones, from which four co-educational public secondary schools were selected for this study. Simple random sampling was also used to select two of the four schools chosen to be part of the treatment group, while the remaining two were assigned to the Control Group. Stratified random sampling was also used to distribute the participants based on gender. To select the participants for the study, Educational Stress Scale for Adolescents, developed by Sun, Dunne, Hou and Xu (2010), was administered to determine the extent students experiencing stress. The total number of students for the baseline assessment was 248 male and female students. The students who scored 66% and above were selected for the study because they were adjudged to be experiencing a high level of stress. A total of 161 participants (84 male and 77 female) who meet the baseline assessment served as the participants for the study . The selection process is described numerically, as shown in Table 1.

Table 1: Distribution of Participants By Schools and Gender, Age, Gender and Group

Schools	Mean Age	Male	Female
School 1	15.62	23	20
School 2	16.90	20	19
School 3	15.49	20	18
School 4	16.63	21	20
Total	16.16	84	77

The treatment, in form of a training package, took place in the various schools selected. The researcher made use of part of the Mathematics and English Language periods to train the treatment group for eight weeks on how Cognitive Restructuring can be applied to reduce stress and enhance performance in Mathematics and English Language, while the Control Group received normal classes and training on the prevention of malaria fever for the same duration so as to keep them busy. A period of 45 minutes each per week was used for the training in English Language and Mathematics, respectively.

3.5 Research Instruments

Four instruments were used to collect data for this study. They are as follows:

- Mathematics Performance Test (MPT)
- English Language Achievement Test(ELAT)
- Scale for Assessing Academic Stress (SAAS)
- Educational Stress Scale for Adolescents (ESSA)

Mathematics Performance Test (MPT): This test was adapted from past WAEC question papers, with the help of two qualified Mathematics teachers who were WAEC examiners. It consisted of two sections. Section A consisted of information that generated the participants'

biographical data such as age, gender, level of stress, parents' educational background and parents' occupation, while Section B was multiple choice items in Mathematics. The MPT consisted of 50 objective items which attracted 50 marks, each with 4 options, A-D. Emphasis was laid on four topics: Probability, Trigonometry, Series and Sequence, and Quadratic Equations. 120 items were originally selected and subjected to item analysis. For an item to be included in the final instrument after item analysis, two criteria were met: (a) discrimination index range from 0.4 to 0.6, and (b) difficulty index range from 0.30 to 0.60 (Ilogu, 2005). The test blueprint for Mathematics is shown in Table 2 below.

Table 2: Test Blueprint for Mathematics Performance Test

Content Area	Weight	BEHAVIOURAL OBJECTIVES			Total
		Knowledge 30%	Comprehension 40 %	Application 30 %	
Probability	20%	3	4	3	10
Trigonometry	30 %	5	6	4	15
Series and Sequence	30%	4	6	5	15
Quadratic Equation	20%	3	4	3	10
Total	100%	15	20	15	50

During the pilot study, this instrument was administered twice within an interval of three weeks and the scores were correlated using Pearson Product Moment Correlation to estimate the reliability co-efficient. A co-efficient value of 0.78 was obtained; thus, the instrument had high reliability. Below is a sample of the items:

Instruction: Answer all questions. Each question is followed by four options lettered A-D.

Choose the correct option for each item (question).

1. A coin is tossed and a die is thrown. What is the probability of getting a head and a perfect square?

- (a) $\frac{1}{3}$ (b) $\frac{5}{12}$ (c) $\frac{1}{6}$ (d) $\frac{5}{6}$

2. Calculate the sum of the first ten terms of the Arithmetic progression $3+5+7+9+\dots\dots\dots$

- (a) 120 (b) 122 (c) 12 (d) 126

English Language Achievement Test (ELAT): Multiple choice items in English Language were adapted from past WAEC question papers (2006 to 2015) from which 5 relevant items were selected for each year. The form consisted of 50 items which attracted 50 marks, each with 4 options. Emphasis was placed on four topics, namely: Grammar, Lexis and Structure, Vocabulary and Comprehension. A test blueprint was developed on these topics to enable the researcher construct test items based on content and behavioural objectives of topics under study. The items covered only the topics that were studied during the period of the study. The items selected were also given to two teachers who were WAEC examiners. 120 items were originally selected, but for an item to be included in the final instrument after item analysis, two criteria were met: (a) discrimination index range from 0.4 to 0.6, and (b) difficulty index range from 0.30 to 0.60 (Ilogu, 2005). A test-retest reliability co-efficient value of 0.71 was obtained; thus, the instrument had high reliability.

Table 3: Test Blueprint for English Language Achievement Test (ELAT)

Content Area	Weight	BEHAVIOURAL OBJECTIVES			Total
		Knowledge 40%	Comprehension 30 %	Application 30 %	
Grammar	30%	6	5	4	15
Lexis and Structure	20 %	4	3	3	10
Vocabulary	20%	4	3	3	10
Comprehension	30%	6	4	5	15
Total	100%	20	15	15	50

During the pilot study, this instrument was administered twice within an interval of three weeks and the scores were correlated using Pearson Product Moment Correlation to estimate the reliability co-efficient. A co-efficient value of 0.71 was obtained; thus, the instrument had high reliability. Below is a sample of the items:

Instruction: Fill in the gaps with the appropriate options stated below. Each question is followed by four options lettered A-D.

1. May I see your passport, please? What tone is used in this statement?

- (a) Falling intonation (b) Rising and falling intonation (c) Falling and rising intonation (d) Rising Intonation

Scale for Assessing Academic Stress (SAAS) by Sinha, Sharma, and Mahendra (2001)

A 35-item self-report measure was adapted from Scale for Assessing Academic Stress (SAAS) by Sinha, Sharma, and Mahendra (2001). This scale was culture fair by reconstructing statements that were vague to suit local environment during the pilot study. The researcher adapted this instrument to measure only three types of stress (academic, physical and social) experienced by students. All the items under each factor had fairly high co-efficient, ranging from 0.60 to 0.85. The test-re-test reliability of SAAS over the period of one month was 0.88 as

reported by the authors. Each item consisted of 5 options, with a numerical weight ranging from 0 to 4. The options were: Never: 0, Rarely: 1, Sometimes: 2, Often: 3, and Very Often: 4. The scoring of the instrument ranged from 4 to 0 for positively-worded statements and reversed for negatively-worded statements. During the pilot study, this instrument was administered twice within an interval of three weeks and the scores were correlated using Pearson Product Moment Correlation to estimate the reliability co-efficient. A co-efficient value of 0.82 was obtained; thus, the instrument had high reliability co-efficient and it was therefore adjudged appropriate for the study. Below are some samples of the items.

S/N	ITEMS	0	1	2	3	4
1.	Difficulty in concentrating during in classroom activities					
2.	Loss of sleep at night nobody to help					

Educational Stress Scale for Adolescents (ESSA) by Sun, Dunn, Hou and Xu (2010)

This instrument was adapted by simplifying the words to suit the context from Educational Stress Scale for Adolescents (ESSA) by Sun, Dunn, Hou and Xu (2010). It was culture fair to suit the local environment by reconstructing statements that were vague during the pilot study. It is a 16-item 5-point scale designed to measure multiple variables of stress related to academic activities. The variables are pressures from study, workload, worry about grades, self-expectation and despondency. The scale ranged from 1=strongly disagree to 5= strongly agree. The ESSA had a satisfactory internal consistency using Cronbach's alpha of 0.89 as indicated by the authors. The scoring of the instrument ranged from 5 to 1 for positive statement and reversed for negative statement. During the pilot study, this instrument was administered twice within an interval of three weeks and the scores were correlated using Pearson Product Moment Correlation to estimate the reliability co-efficient. A co-efficient value of 0.81 was obtained; thus, the instrument had high reliability and was, therefore, suitable to be used for the study. Some samples of the items are shown below.

S/N	ITEMS	5	4	3	2	1
1.	I feel a lot of pressure in my daily study.					
2.	I feel that I have disappointed my parents when my test/examination results are poor.					

3.6 Validity and Reliability

Content Validity of the Instruments: The research instruments for data collection were presented to the researcher's supervisors and other experts in the Guidance and Counselling Department for thorough examination, correction, modification and moderation. Their corrections and suggestions were useful and effected.

Pilot Study

The reliability of the instruments was established during the pilot study. The reliability coefficients are presented in Table 4. A pilot study, which is in form of a mini study, was carried out in a secondary school which was not part of the schools selected, and far away from the area used for the main study. Through stratified random sampling, thirty (30) students consisting of 15 boys and 15 girls, were selected through stratified random sampling to participate in the exercise. The four instruments, namely Mathematics Performance Test, English Language Achievement Test, Scale for Assessing Academic Stress, and Educational Stress Scale for Adolescents were administered to the students. After three weeks, they were re-administered to the same group of SS Two students. Thereafter, the scores of the two tests were correlated using Pearson Product Moment Correlation Statistics to estimate their reliability co-efficient. Observations made were utilized to improve the main study. The estimated values obtained for the instruments are presented in Table 4.

Table 4: Estimated Value for Research Instruments (Test-retest reliability) N=30)

Instruments	Variable	No. of Items	No. of Participants	Test	M	SD	Rtt
Scale for Assessing Academic Stress (SAAS)	(SAAS)	35	30	1 ST 2 ND	121.70 11800	3.44 3.33	0.82
	Physical Stress PS	11	30	1 ST 2 ND	37.46 35.73	1.92 1.74	0.77
	Academic Stress AS	15	30	1 ST 2 ND	54.40 53.76	1.52 1.50	0.75
	Social Stress SS	9	30	1 ST 2 ND	29.83 28.86	1.48 1.85	0.79
Mathematics Performance Test	MPT	50	30	1 ST 2 ND	41.50 42.80	2.16 2.83	0.78
English Language Achievement Test	ELAT	50	30	1 st 2 ND	41.16 43.16	2.33 3.09	0.71
Educational Stress Scale for Adolescents	ESSA	16	30	1 ST 2 ND	66.40 65.56	1.45 1.43	0.81

Table 4 shows that the test-retest reliability indices of Scale for Assessing Academic Stress gave 0.82; Mathematics Performance Test gave 0.78; English Language Achievement Test gave 0.71, and Educational Stress Scale for Adolescents gave 0.81. The values were adjudged to be high; hence they were suitable and reliable to be used for the study.

3.7 Procedure for Data Collection

With a letter of introduction obtained from the Head of Department of Educational Foundations, University of Lagos, the researcher sought permission from the selected secondary schools in order to have access to the students. The purpose and benefits of the study were briefly explained and the request was granted.

3.8 Appointment and Training of Research Assistants

Four teachers - of which two were graduates of B.sc (Ed.) Mathematics and English Language respectively, with a minimum of five years' teaching experience were appointed as research assistants for the administration and collection of completed research instruments. They were trained for a period of one hour, once a day, for one week on their expected roles during the training period and in the administration of the instruments. The research assistants were adequately rewarded for their participation.

Experimental Procedure

Treatment Procedures: The study was carried out in three stages at different locations in each of the selected schools and lasted for eight weeks, thus:

- Stage 1: **Pre – test**
- Stage 2: **Treatment**
- Stage 3: **Post-test**

Administration of Instruments: The instruments developed were administered to the participants by the researcher with the help of the research assistants.

Stage One: Pre-Treatment stage : In the first week of contact with the participants at each of the selected schools, the researcher was introduced to the participants by the Vice Principal (Academic) of the school. Three activities were carried out during this phase. The first was (1) Pre-Assessment using the ESSA as baseline assessment tool to qualify participants for training; (2) Random assignment of groups to treatment and control conditions, and (3) Administration of MPT, ELAT, and SAAS to the participants in the two experimental groups to get pre-test scores on each of the three measures. The responses were collected after completion.

Stage Two: Detailed Treatment Procedure (Cognitive Restructuring Strategy)

There were two experimental groups. The first group received training on Cognitive Restructuring, while the second group - the Control Group - was not exposed to training but rather engaged with talk on ways to prevent malaria fever. The group met during the normal Mathematics and English Language lessons for eight weeks. Each session lasted for forty-five minutes.

Group One: Cognitive Restructuring Training Session

This session was designed to change the attitudes and thinking of secondary school students showing poor academic performance as a result of stress faced at home and in school. The goal of Cognitive Restructuring was to make participants reduce stress with more accurate and less stress-inducing thinking habits which would help in improving academic performance among secondary school students. The Cognitive Restructuring Therapy focused on the following: identifying the situation at hand, automatic thoughts, identification of unrealistic beliefs, negative statements, time management, use of méditation or deep breathing, distraction and humour, and overcoming failure among secondary school students. There were eight sessions as follows:

Session 1: Introduction and Administration of Research Instruments (Pre-test)

- The researcher established rapport with the participants and encouraged them to cooperate as the strategy would be useful to them later.
- The researcher intimated the participants on the rationale and procedure for the treatment.
- The researcher later administered all the instruments to the participants for a pre-test

Session 2: Identifying the Situation at Hand. This is the stage where participants attributed their poor performances to stress-related physical, emotional, social or/and academic factors.

- The researcher started by describing the situation that may trigger a person's negative thought with practical examples.
- The researcher gave examples of physical stress: back pain, neck pain, headache, lack of energy, inability to sleep, chest pain, clenched jaw, stomach problem, fast heartbeat, and so on.
- The researcher gave examples of social stress: lack of assistance, irritation with everyone, lack of relationship with other friends, pressure from families about low grade, etc.
- The researcher gave examples of academic stress: difficulty in concentrating, forgetfulness, constant daydreaming, difficulty in problem-solving, non-participation in class activities, doubting one's abilities, hesitating to ask questions, poor grades, and so on.
- The researcher encouraged participants to write down different things that triggered their negative thoughts into the appropriate box on the worksheet.
- The researcher also discussed and analysed each of the things that triggered the students' negative thoughts while at the same time introducing self-talk, beliefs and actions to change their thoughts. This, of course, was done with the aim of reducing the stress students were facing.
- The researcher gave room for questions from students which she responded to.

Session 3: Identifying Automatic Thoughts

- The researcher carried out a review of what was discussed in session two.
- The researcher guided the participants through the identification of their automatic thoughts by explaining that participants should write down the natural reactions or automatic thoughts experienced when they were stressed. The students gave examples

such as “Maybe my analysis skills aren't good enough for me to pass my English Language and Mathematics examinations” and “I have failed to consider other things that could make me pass my English Language and Mathematics exams”.

- The researcher gave more explanation on the distressing thoughts or statements written by the students.
- Participants were allowed to ask questions while the researcher responded to them.
- End of session.

Session 4: Identification of Unrealistic Beliefs, Negative Self-statements on Stress and Academic Achievement on Stress and Academic Achievement. During the fourth session, participants were presented with the identification of unrealistic beliefs, negative self-statements on stress and academic achievement. Participants were also presented with the role of self-statements in emotions and behaviour. The idea that emotions are not the direct result of events, but are a product of an event being perceived. Participants were also trained on how to modify their negative self-statements and replace them with positive self-statements. The participants were provided with the information that stress reactions take place in stages. Participants were informed that stress reactions are not as automatic as previously thought, and that they can intervene in the middle of the reaction with various techniques. The researcher explained the techniques that can be used to cope with the stress experienced.

Session 5: Use of Meditation Therapy

- The researcher reviewed the discussion of session four.
- The researcher guided the participants through the use of meditation therapy by explaining that if one is stressed by thoughts, one may find it difficult to explore and concentrate on one's study. Therefore, one needs mediation and deep-breath therapy to

calm down oneself and also achieve one's aim. The researcher also explained that the key to deep breathing was to breathe deeply from the abdomen, getting as much fresh air as possible into your lungs. When you take deep breaths from the abdomen, rather than shallow breaths from your upper chest, you inhale more oxygen. The more oxygen one gets, the less shortness of breath and anxiety one feels.

- The researcher instructed the participants to carry out some physical exercises.
- The researcher asked for the participants' thoughts and responded to their questions.
- End of session.

Session 6: Time Management

- The researcher guided the participants through ways of managing time to reduce stress and enhance performance by telling them that they should practise the following:
 1. Doing one thing at a time.
 2. Arranging reading and writing materials on time always.
 3. Prioritizing tasks.
 - Finding a clean and comfortable place to read and avoid interruptions.
 - Setting an alarm.
 - Breaking overwhelming tasks into small pieces and allocating time to each task.

(Remember that time is precious. Try to value each day as it comes.)

 - (a) The researcher allowed the participants to ask questions which she later responded to.
 - (b) End of session.

Session 7: Distraction and Humour

- (1) The researcher reviewed what was discussed in session six.
 - (2) The researcher discussed with the participants on distraction and humour by explaining that if one is stressed by thoughts, one may find it difficult to explore and concentrate on one's study; therefore, one needs distraction and humour to calm down oneself and also do well in Mathematics and English. The researcher also explained that one key importance of distraction and humour is that they function as a diversion, interrupting the chain of negative thoughts that result in stress and poor performance.
- The researcher deployed anecdotes to make the participants laugh. Humorous stories often help people to recognise that no matter how bad their situation might be, there is always someone who is worse off.
 - Funny movies, comedy shows and videos were used as forms of media outlets. These mediums were used to relieve physical tension. Humour shifts the focus away from oneself to others. This shift of attention may help to enlarge people's anxiety-narrowed perspective to include the misfortune of others, thereby reducing the perceived need to stress about their own problems.

Session 8: How to Overcome Academic Failure

- The researcher reviewed what was discussed in session seven.
- The researcher asked the participants to write out the things that may contribute to poor academic performance in Mathematics and English Language. Some of the reason given included studying less of Mathematics and English Language; lack of textbooks and teaching aids in Mathematics and English Language; over-crowded classrooms; inadequate supply of electricity both at home and at school; inadequate infrastructure like classrooms, chalkboard, desks and chairs; poor supply of pipe-borne water; lack of motivation from Mathematics and English

Language teachers and parents; and lack of a functional library.

- The researcher discussed and analysed each of the things that the participants perceived to be contributors to poor academic performance, while at the same time encouraging them to study hard at school and at home.
- The researcher gave room for questions which she responded to.
- The researcher later re-administered all the research instruments for a post-test.

Training for the Treatment Expectancy Group: The training for the treatment expectancy Group was a dummy. The researcher guided against the use of any intervention to avoid contamination of the result. However, the pre-test was administered at the first contact of the researcher with the participants. The participants in the Control Group were not exposed to treatment because it was a treatment expectancy Control Group but were taken through how to prevent mosquitoes bites which may cause malaria fever in the home for the same period and the same number of weeks. Mosquitoes are one of the dangerous animals in the world. Conservative estimates hold mosquitoes responsible for hundreds of millions of malaria cases each year. However, mosquitoes also transmit a host of other diseases, including West Nile virus, yellow fever, and dengue fever. There is ample reason to take every possible measure to avoid mosquito bites even without taking into account their terrible, stinging itchiness. For the best chance at thwarting these tiny killers, know where mosquitoes live, how to repel them, and how to kill them. The researcher demonstrated to the participants how to prevent mosquitoes in the following ways:

Session 1: Introduction and Administration of Research Instruments

- The researcher intimated the participants with the rationale and the procedure for the treatment.

- The researcher also established a friendly atmosphere and encourage them to cooperate as the strategy would be useful to them later.
- The researcher later administered all the instruments to the participants for pre-test.

Session 2: Use mosquito repellent

A variety of specially-formulated insect repellents are available for sale at camping or sporting goods stores. Apply insect repellent to uncovered skin surfaces when outdoors, especially during the day. When using sunscreen, apply it before insect repellent.

Session 3: Consider an all-natural solution

Experiment with non-chemical solutions such as Citronella (natural plant oil). Tea tree oil and vitamin B have reportedly helped some people repel mosquitoes. As with any product, their effectiveness depends on the situation, your own skin chemistry, and the exact type of mosquito you are dealing with. These was explained to the participants.

Session 4: Wear loose, long-sleeved shirts and long pants when outdoors

One of the best ways to keep mosquitoes from biting you is to simply cover your skin. Wear your sleeves and pant legs as long as possible to cover as much skin as possible. Also keep your clothing as loose as possible. This serves two purposes: first, it is much more comfortable in the hot, humid weather where mosquitoes thrive. Second, mosquitoes can sometimes bite through clothing that is held tight against the skin, especially if the fabric is thin.

Session 5: Sleep with a mosquito net over your bed

The mosquito netting has fine holes big enough to allow breezes to easily pass through but small enough to keep mosquitoes and other biting insects out. Hang the netting over your bed, securing the top of the net to one or more surfaces. Support the net so that it is tented without hanging down onto you. Make sure to sleep without touching the sides - mosquitoes can

actually bite you through the netting if it is tight against your skin. Check for holes regularly - patch them with duct tape for a quick fix.

Session 6: Avoid standing water

Mosquitoes are often attracted to water, especially stagnant water, so lakes, stagnant creeks, bogs, marshes, and swamps are mosquito havens, especially during hot months. Most species of mosquitoes lay their eggs in stagnant water and some have even adapted to lay their eggs in salt water. Stay away from any bodies of stagnant water, whether they are small puddles or vast swamps, to reduce your risk of encountering mosquitoes.

Session 7: Do not let water stand near your home or campsite

It is easy to unintentionally create habitats for mosquitoes to live and breed in. For instance, a kiddie pool left out in the summer sun for several days can soon become a hotbed for mosquitoes. Get rid of any stagnant water around your home or campsite. If you have a pool, cover it when it is not in use and treat the water with chemical additives like chlorine according to the manufacturer's instructions. Here are just a few places water can accumulate:

Session 8: Avoid getting too hot

This advice is especially important if you are in a hot, humid climate. Mosquitoes are thought to be attracted to warm bodies, so staying cool is one way to avoid bites. Dark-coloured fabrics absorb more heat from the sun than light-coloured alternatives, so avoid them. Also avoid excessive exercise when possible. Not only will exercise cause you to radiate heat, it will also cause you to breathe heavily. Carbon dioxide, one of the gasses you exhale, can be smelled by mosquitoes even at relatively long distances.

Stage 3: Post-treatment Assessment

After having completed this, the researcher re-administered all the instruments to both treatment and control group for a post-test to test the effect of cognitive restructuring in reducing stress.

3.9 Method of Data Analysis

The data collected from the various instruments were analysed, using both descriptive and inferential statistics appropriate for each hypothesis. All hypotheses were tested at 0.05 level of significance. The means and standard deviations for the pre and post- test assessment were computed. All the hypotheses were tested using Analysis of Covariance (ANCOVA.) This is applicable in this study because there was need to adjust the criterion scores Y, an initial variable X. More so, it was used to determine the effect of Cognitive Restructuring on Stress Factors and Academic Performance using pre and post test scores of the independent variables while partialling out or removing the effect of other variables. The covariance corrects for effect of pretesting. The use of an ANCOVA is justified because of its ability to statistically correct the initial differences in the pre-test scores of the assessment instruments among the participants.

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION OF RESULTS

This section presents the results obtained from the various statistical analyses carried out in the study. The six null hypotheses formulated to guide the study were tested using Analysis of Covariance (ANCOVA) at 0.05 level of significance. The results obtained from the various statistical analyses carried out in the study are thus presented below:

4.1 Testing of Hypotheses

Hypothesis One

Gender and experimental conditions would not have significant effect on post-test mean scores of social factor stress among participants. The hypothesis was tested using two-way Analysis of Covariance. The result of the analysis is presented in Table 5 and Table 6.

Table 5: Descriptive Data on Gender and Experimental Condition on Social Factor Stress

Group	Gender	Pre-test			Post-test		
		N	Mean	SD	Mean	SD	Mean Difference
Cognitive Restructuring	Male	43	29.69	1.42	23.16	1.46	6.53
	Female	39	29.79	1.59	22.53	1.57	7.26
	Total	82	29.74	1.51	22.85	1.52	6.89
Control	Male	41	29.63	1.54	27.85	1.33	1.78
	Female	38	29.81	1.48	27.92	1.09	1.89
	Total	79	29.72	1.51	27.89	1.21	1.83

Evidence from Table 5 shows that participants exposed to Cognitive Restructuring Training had the highest mean difference score of 6.89, whereas the Control Group had 1.83. To determine whether significant difference existed in social factor stress scores among participants, two-way

ANCOVA was used and the results are presented in Table 6.

Table 6: Analysis of Covariance on Effects of Gender and Experimental Condition on Social Factor Stress

Source	SS	Df	MS	F	Sig
Corrected model	1026.50	4	256.62	135.78	.000
Covariate	4.39	1	4.39	2.32	0.13
Experimental Group	1019.69	1	1019.69	539.51	.000*
Gender	3.46	1	3.46	1.83	0.17
Exp. Group Vs Gender	4.67	1	4.67	2.47	0.12
Within Group	295.05	156	1.89		
Total	1327.26	160			

* Significant at 0.05; df = 1 and 156; critical = 3.91

The data in Table 6 shows that a calculated f-value of 539.51 resulted as the effect of experimental condition on social factor stress among participants. This calculated f-value is significant, since it is greater than the critical f-value of 3.91 given 1 and 156 degree of freedom at 0.05 level of significance. Table 6 also shows that gender did not significantly affect social factor stress among participants ($f = 1.83$; $df = 1$ and 156 ; critical $f = 3.91$; $P > 0.05$). Similarly, the interaction effect between gender and experimental condition on social factor stress among participants was not significant ($f = 2.47$; $df = 1$ and 156 ; critical $f = 3.91$; $P > 0.05$). Therefore, the null hypothesis was not rejected. However, since there is significant effect of experimental conditions on social stress, further post-hoc analysis of data was done to determine which groups had higher significant impact on social stress. The result of the analysis is presented in Table 7.

Table 7: Pair Wise Comparison of the Mean Difference between Groups in Terms of Social Stress

(I) Experimental Conditions	(J) Experimental Conditions	Mean Difference (I-J)	Std. Error	Sig. ^b
Cognitive Restructuring	Control	-5.039*	.217	.000
Control	Cognitive Restructuring	5.039*	.217	.000

Evidence from Table 7 shows that significant difference existed between respondents in Cognitive Restructuring and those in the control groups with mean difference of (5.039; $p < 0.00$). This further shows that participants from Cognitive Restructuring adjusted better in Social stress than those in the control groups.

Hypothesis Two: Gender and experimental conditions would not have significant effect on post-test mean scores of physical factor stress among participants. The hypothesis was tested using two-way Analysis of Covariance. The results of the analysis are presented in Table 8, 9 and 10.

Table 8: Descriptive Data on Experimental Condition and Gender on Physical Factor Stress among Participants

Group	Gender	<u>Pre-test</u>			<u>Post-test</u>		Mean Difference
		<i>N</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Cognitive Restructuring	Male	43	37.48	1.78	29.55	1.65	7.93
	Female	39	37.39	1.68	28.41	2.14	8.98
	Total	82	37.43	1.73	28.98	1.89	8.45
Control	Male	41	37.63	1.69	35.73	1.84	1.90
	Female	38	37.47	1.79	36.23	1.95	1.24
Total		79	37.55	1.74	35.98	1.89	1.57

The results presented in Table 8 shows that before training, the physical factor stress of participants looked similar. This was evident from the pre-test mean scores of physical stress (37.43 and 37.55). However, in post-test mean scores, the participants that were exposed to Cognitive Restructuring Therapy had more reduction in their stress than their Control Groups counterparts. Evidence from Table 8 further shows that the participants from the Cognitive Restructuring had the highest mean score difference of 8.45, whereas the Control Group had 1.57. To determine whether significant difference existed in physical factor stress scores among participants, two-way ANCOVA was used and the results are presented in Table 9.

Table 9: Analysis of Covariance on Effects of Gender and Experimental Condition on Physical Stress among Participants

Sources	SS	df	MS	F	Sig
Corrected Model	1708.12	4	427.03	119.62	.000
Covariate	9.53	1	9.53	2.67	.104
Experimental Condition	1686.67	1	1686.67	472.46	.000*
Gender	1.35	1	1.35	0.38	.539
Exp. Condition vs Gender	4.75	1	4.75	1.33	.250
Within Group	557.43	156	3.57		
Total	2259.73	160			

* Significant at 0.05; df = 1 and 156; critical = 3.91

Table 9 shows that a significant effect of experimental conditions on physical factor stress among participants existed ($F_{cal} = 472.46$; $df = 1$ and 156 ; critical $f = 3.91$; $P < 0.05$). Further analysis of data also shows that no significant difference existed among participants due to gender ($F_{cal} = 0.38$; $df = 1$ and 156 ; critical $f = 3.91$; $P > 0.05$). Similarly, the interaction effect between gender and experimental condition on physical factor stress among participants was not significant ($F = 1.33$; $df = 1$ and 156 ; critical $F = 3.91$; $P > 0.05$); hence the non-rejection of the

null hypothesis. However, since there is significant effect of experimental conditions on social stress, further post-hoc analysis of data was done to determine which groups had higher significant impact on physical stress. The result of the analysis is presented in Table 10

Table 10: Pair Wise Comparison of the Mean Difference between Groups in Terms of Physical Stress

(I) Experimental Conditions	(J) Experimental Conditions	Mean Difference (I-J)	Std. Error	Sig.
Cognitive Restructuring	Control	-6.484*	.298	.000
Control	Cognitive Restructuring	6.484*	.298	.000

Evidence from Table 10 shows that significant difference existed between respondents in Cognitive Restructuring and those in the control groups with mean difference of (6.484; $p < 0.00$). This further shows that participants from Cognitive Restructuring adjusted better in physical stress than those in the control groups.

Hypothesis Three: Significant effect of gender and experimental conditions would not occur on post-test mean scores of academic factor stress among participants. The hypothesis was tested using two-way Analysis of Covariance. The results of the analysis are presented in Table 11, 12, 13 and 14 below.

Table 11: Descriptive Data on Effect of Experimental Condition and Gender on Academic Factor Stress among Participants

Group	Gender	Pre-test			Post-test		
		N	M	SD	M	SD	Mean Difference
Cognitive Restructuring	Male	43	54.23	1.74	44.95	4.63	9.28
	Female	39	54.20	1.43	48.08	4.98	6.12
	Total	82	54.22	1.58	46.52	4.81	7.70
Control	Male	41	54.51	1.48	51.56	1.36	2.57
	Female	38	54.18	1.52	51.94	1.52	2.24
	Total	79	54.34	1.50	51.75	1.44	2.59

Table 11 shows that after the training intervention, the post-test mean score on Cognitive Restructuring was 46.52, while the Control Group was 51.75. Evidence from Table 11 further indicates that participants who were exposed to Cognitive Restructuring Training had the highest mean difference score of 7.70, whereas the Control Group had 2.59. To determine whether significant difference existed in academic factor stress scores among participants, two-way ANCOVA was used and the results are presented in Table 12.

Table 12: Analysis of Covariance of Effect of Experimental Condition and Gender on Academic Stress among Participants

Source	SS	Df	MS	F
Corrected Model	1368.70	4	342.17	27.05
Covariate	32.68	1	32.68	2.58
Experimental Condition	1084.42	1	1084.42	85.72*
Gender	130.69	1	130.69	10.33*
Exp. Condition vs Gender	70.27	1	70.27	5.55*
Within Group	1973.98	156	12.65	
Total	3292.04	160		

*p < .05

Table 12 shows that the effect of experimental condition on academic stress among participants was significant ($F(1, 156) = 85.72$; $\eta^2 = 3.91$; $P < 0.05$). The data further shows that gender was significant ($F=10.33$; $df = 1$ and 156 ; critical $f = 3.91$; $P < 0.05$). Similarly, the interaction effect between gender and experimental condition on academic stress among participants was also significant ($F=5.55$; $df = 1$ and 156 ; critical $f = 3.91$; $P < 0.05$). Hypothesis three was therefore rejected. It was concluded that the post-test academic factor stress scores of male and female participants in the Experimental and Control Groups were significantly different. Since there is significant effect of gender and experimental conditions on academic stress, further post-hoc analysis of data was done to determine which groups and sex had higher significant impact on academic stress. The result of the analysis is presented in Table 13 and 14.

Table 13: Pair Wise Comparison of the Mean Difference between Groups in Terms of Academic Stress

(I) Experimental Conditions	(J) Experimental Conditions	Mean Difference (I-J)	Std. Error	Sig.
Cognitive Restructuring	Control	-.511 [*]	.531	.000
Control	Cognitive Restructuring	5.11 [*]	.531	.000

Evidence from Table 13 shows that significant difference existed between respondents in Cognitive Restructuring and those in the control groups with mean difference of (5.11; $p < 0.00$). This further shows that participants from Cognitive Restructuring adjusted better in academic stress than those in the control groups.

Table 14: Pair Wise Comparison of the Mean Difference between Gender and of Academic Stress

(I) Experimental Conditions	(J) Experimental Conditions	Mean Difference (I-J)	Std. Error	Sig.
Male	Female	-2.49 [*]	.531	.000
Female	Male	2.49 [*]	.531	.000

Evidence from Table 14 shows that significant difference existed between male and female respondents in Academic stress with mean difference of (2.49; $p < 0.00$). This further shows that male participants adjusted better in academic stress than their female counterparts.

Hypothesis Three: Significant effect of gender and experimental conditions would not occur on post-test mean scores of academic factor stress among participants. The hypothesis was tested using two-way Analysis of Covariance. The results of the analysis are presented in Table 15, 16

and 1 below.

Table 15: Descriptive Data on Effect of Experimental Condition and Gender on Academic Factor Stress among Participants

Group	Gender	Pre-test			Post-test		
		N	M	SD	M	SD	Mean Difference
Cognitive Restructuring	Male	43	54.23	1.74	44.95	4.63	9.28
	Female	39	54.20	1.43	48.08	4.98	6.12
	Total	82	54.22	1.58	46.52	4.81	7.70
Control	Male	41	54.51	1.48	51.56	1.36	2.57
	Female	38	54.18	1.52	51.94	1.52	2.24
	Total	79	54.34	1.50	51.75	1.44	2.59

Table 15 shows that after the training intervention, the post-test mean score on Cognitive Restructuring was 46.52, while the Control Group was 51.75. Evidence from Table 15 further indicates that participants who were exposed to Cognitive Restructuring Training had the highest mean difference score of 7.70, whereas the Control Group had 2.59. To determine whether significant difference existed in academic factor stress scores among participants, two-way ANCOVA was used and the results are presented in Table 16.

Table 16: Analysis of Covariance of Effect of Experimental Condition and Gender on Academic Stress among Participants

Source	SS	Df	MS	F
Corrected Model	1368.70	4	342.17	27.05
Covariate	32.68	1	32.68	2.58
Experimental Condition	1084.42	1	1084.42	85.72*
Gender	130.69	1	130.69	10.33*
Exp. Condition vs Gender	70.27	1	70.27	5.55*
Within Group	1973.98	156	12.65	
Total	3292.04	160		

*p < .05

Table 16 shows that the effect of experimental condition on academic stress among participants was significant ($F(1, 156) = 85.72$; $\eta^2 = 3.91$; $P < 0.05$). The data further shows that gender was significant ($F=10.33$; $df = 1$ and 156 ; critical $f = 3.91$; $P < 0.05$). Similarly, the interaction effect between gender and experimental condition on academic stress among participants was also significant ($F=5.55$; $df = 1$ and 156 ; critical $f = 3.91$; $P < 0.05$). Hypothesis three was therefore rejected. It was concluded that the post-test academic factor stress scores of male and female participants in the Experimental and Control Groups were significantly different.

Table 17: Pair Wise Comparison of the Mean Difference between Groups in Terms of Physical Stress

(I) Experimental Conditions	(J) Experimental Conditions	Mean Difference (I-J)	Std. Error	Sig.
Cognitive Restructuring	Control	-6.484*	.298	.000
Control	Cognitive Restructuring	6.484*	.298	.000

Evidence from Table 17 shows that significant difference existed between respondents in Cognitive Restructuring and those in the control groups with mean difference of (6.484; $p < 0.00$). This further shows that participants from Cognitive Restructuring adjusted better in physical stress than those in the control groups.

Hypothesis Four: Experimental conditions and gender would not have interaction effect on participants' stress. The hypothesis was tested using two-way Analysis of Covariance. The results of the analysis are presented in Table 18,19,20 and 21 below.

Table 18: Descriptive Data on Pre-test and Post-test Scores of Stress Scores due to Gender and Experimental Conditions

Experimental Group	<u>Pre-test</u>				<u>Post-test</u>		
	N	Gender	M	SD	M	SD	MD
Cognitive Restructuring	43	Male	121.33	3.04	96.00	3.84	25.33
	39	Female	121.49	2.80	100.03	5.37	21.46
Total	82		121.41	2.92	98.02	4.80	23.39
Control Group	41	Male	121.78	2.70	115.15	2.80	6.63
	38	Female	121.47	3.12	116.10	2.36	5.37
Total	79		121.63	2.91	115.63	2.58	6.00

Evidence from Table 18 shows that the male and female participants exposed to Cognitive Restructuring Training had mean difference of 25.33 and 21.46, whereas the Control Group had mean difference of 6.63 and 5.37, for males and females, respectively. This shows that there is a difference in stress scores between male and female students. To determine whether a significant difference existed due to gender and experimental conditions, two-way ANCOVA was utilised and results are presented in Table 19.

Table 19: 2 x 2 ANCOVA Tests of the Effects of Experimental Condition and Gender on Post-test Stress

Source	SS	df	MS	F	Sig.
Corrected Model	12961.37	4	3240.34	227.71	0.00
Covariates(Pre-Stress)	16.28	1	16.28	1.14	0.28
Experimental Conditions	12405.74	1	12405.75	871.80	0.00*
Gender	251.01	1	251.01	17.64	0.00*
Exp. Group * Gender	52.42	1	91.12	6.40	0.01*
Error	2219.38	156	14.23		
Total	14944.83	160			

* $p < .05$; df 1 and 156; F-cal= 17.64, F-critical= 3.91

Table 19 shows that a calculated F-value of 17.64 for gender was significant at 0.05, with degree of freedom 1 and 156 because it was greater than f-critical of 3.91, $P\text{-value} < 0.05$. The F-value of 871.80 for experimental condition was significant since it was greater than the F-critical value of 3.91 at 0.05, given 1 and 156 degrees of freedom, while F-value of 6.40 for interaction effect between experimental condition and gender was significant at 0.05 with degree of freedom 1 and 156, as it was greater than f-critical of 3.91, $P\text{-value} < 0.05$. Hypothesis four was therefore rejected. It was concluded that the post-test stress scores of male and female participants in the Experimental and Control Groups were significantly different.

Since there is significant effect of gender and experimental conditions on stress, further post-hoc analysis of data was done to determine which groups and sex had higher significant impact on stress. The result of the analysis is presented in Tables 20 and 21.

Table 20: Pair Wise Comparison of the Mean Difference between Groups and Stress

(I) Experimental Conditions	(J) Experimental Conditions	Mean Difference (I-J)	Std. Error	Sig.
Cognitive Restructuring	Control	-17.39 [*]	.6.89	.000
Control	Cognitive Restructuring	17.39 [*]	.6.89	.000

Evidence from Table 20 shows that significant difference existed between respondents in Cognitive Restructuring and those in the control groups with mean difference of (17.39; $p < 0.00$). This further shows that participants from Cognitive Restructuring adjusted better in stress than those in the control groups.

Table 21: Pair Wise Comparison of the Mean Difference between Gender and of Academic Stress

(I) Experimental Conditions	(J) Experimental Conditions	Mean Difference (I-J)	Std. Error	Sig.
Male	Female	-4.13 [*]	.6.89	.000
Female	Male	4.13 [*]	.6.89	.000

Evidence from Table 21 shows that significant difference existed between male and female respondents in Academic stress with mean difference of (2.49; $p < 0.00$). This further shows that male participants adjusted better in stress than their female counterparts.

Hypothesis five: There is no significant effect of experimental conditions and stress level on post-test scores of academic performance in Mathematics among participants. The hypothesis was tested using two-way Analysis of Covariance. The result of the analysis is presented in Table 22,23 and 24.

Table 22: Descriptive Statistics on Pre- and Post-test Scores of Academic Performance in Mathematics due to Level of Stress and Experimental Condition across the Groups

Experimental Group	N	Pre-test		Post-test			Mean Difference
		Stress Level	M	SD	M	S	
Cognitive Restructuring	27	Low	41.26	3.06	53.78	1.89	12.52
	31	Moderate	41.48	2.80	53.94	3.45	12.46
	24	High	42.83	1.61	54.29	4.31	11.46
Total	82		41.86	2.49	54.00	3.22	12.14
Control Group	27	Low					
	24	Moderate	41.70	2.81	43.22	2.69	1.52
			41.75	2.72	43.75		2.00
						3.17	
	28	High	41.93	2.54	43.46	2.53	1.53
Total	79		41.79	2.72	43.48	2.80	1.69

Evidence from Table 22 shows that the participants exposed to Cognitive Restructuring Training who exhibited low, moderate and high level of stress had mean difference of 12.52, 12.46 and 11.46, respectively; whereas the Control Group had mean difference of 1.52, 2.00 and 1.53 for low, moderate and high level of stress, respectively. This shows that there was a difference in mean scores of participants' level of stress across the group. To determine whether a significant difference existed due to level of stress and experimental conditions, three-way ANCOVA was utilized and results are presented in Table 23.

Table 23: 2 x 3 ANCOVA Tests of the Effects of Experimental Condition and Level of Stress on Post-test Academic Performance in Mathematics

Source	SS	Df	MS	F
Corrected Model	4485.10	6	747.52	79.61
Covariates (Pre-stress level)	25.60	1	25.60	2.73
Experimental Conditions	4412.70	1	4412.70	469.94*
Stress Level	3.01	2	1.50	0.16
Experimental Group vs stress level	1.67	2	0.84	0.09
Error	1446.03	154	9.39	
Corrected Total	5889.01	160		

*p < .05

Table 23 shows that a calculated F-value of 1.50 for stress level was not significant at .05 with degree of freedom 2 and 154 because it was lower than F_{crit} of 3.06 P-value >.05. F-critical value of 3.91 at 0.05, given 1 and 154 degrees of freedom, while F-value of 0.09 for interaction effect between experimental condition and stress level was not significant at 0.05 with degree of freedom 2 and 154 as it was less than f-critical of 3.06, P-value is > 0.05. Hypothesis five was therefore not rejected. It was concluded that there was no significant interaction effect of experimental condition and level of stress on academic performance in Mathematics. However, since there is significant effect of experimental conditions on Mathematics, further post-hoc analysis of data was done to determine which groups had higher significant impact on Mathematics performance Test. The result of the analysis is presented in Table 24

Table 24: Pair Wise Comparison of the Mean Difference between Groups and Mathematics

(I) Experimental Conditions	(J) Experimental Conditions	Mean Difference (I-J)	Std. Error	Sig.
Cognitive Restructuring	Control	10.513*	.485	.000
Control	Cognitive Restructuring	-10.513*	.485	.000

Evidence from Table 24 shows that significant difference existed between respondents in Cognitive Restructuring and those in the control groups in Mathematics with mean difference of (10.513; $p < 0.00$). This further shows that participants from Cognitive Restructuring did better in Mathematics Test than those in the control groups.

Hypothesis Six: There is no significant effect of experimental conditions and stress level on post-test scores of academic performance in English Language among participants

Table 25: Descriptive Statistics on Pre- and Post-test Scores of Academic Performance in English Language due to Experimental Condition and Level of Stress across the Groups

Experimental Group	N	<u>Pre-test</u>			<u>Post-test</u>		Mean Difference
		Stress Level	M	SD	M	SD	
Cognitive Restructuring	27	Low	41.70	3.32	54.88	2.04	13.18
	31	Moderate	41.55	2.83	53.80	3.44	12.25
	24	High	41.29	1.57	53.16	4.36	11.87
Total	82		41.51	2.57	53.94	3.28	12.43
Control Group	27	Low	41.93	2.73	44.89	2.67	2.96
	24	Moderate	41.87	2.70	43.75	3.17	1.88
	28	High	41.39	2.48	43.10	2.26	1.71
Total	79		41.73	2.63	43.91	2.70	2.18

Evidence from Table 25 shows that the participants exposed to Cognitive Restructuring Training who exhibited low, moderate and high level of stress had mean difference of 13.18, 12.25 and 11.87, respectively; whereas the Control Group had mean difference of 2.96, 1.88 and 1.71, for low, moderate and high level of stress, respectively. This shows that there is a difference in mean scores of participants' level of stress and academic performance across the group. To determine whether a significant difference existed due to level of stress and experimental conditions, three-way ANCOVA was utilised and results are presented in Table 26.

Table 26: 2 x 3 ANCOVA Tests of Experimental Conditions and Level of Stress on Post-test Academic Performance in English Language

Source	SS	Df	MS	F	Sig
Corrected Model	4194.58	4	1048.64	114.86	.00
Covariates (pre-academic performance)	35.52	1	35.52	3.89	.06
Experimental Conditions	4050.15	1	4050.15	443.61	.00*
Level of Stress	75.97	2	37.98	4.16	.01*
Error	1425.18	156	9.13		
Corrected Total	5583.82	160			

* Significant at 0.05; df 2 and 156; f-cal = 4.16, F –critical = 3.06

* Significant at 0.05; df 1 and 154; f –cal = 443.61, F –critical = 3.91

Table 26 shows that a calculated f-value of 443.61 for experimental condition was significant, since it was greater than the f-critical value of 3.91 at 0.05, given 1 and 156 degrees of freedom. Also the calculated f-value of 4.16 for stress level was significant at 0.05 with degree of freedom 2 and 156 because it was greater than f-critical of 3.06 (P-value < 0.05). Hypothesis six was therefore rejected. It was concluded that there is significant effect of experimental condition

and level of stress on academic performance in English Language. Since there was significant difference between level of stress and academic performance in English Language across the two groups, further post-hoc analysis of data was done to determine which level of stress had higher significant impact on academic performance in English Language across the groups. The result of the analysis is presented in Table 28.

Table 27: Pair Wise Comparison of the Mean Difference between Groups in Terms of Academic Performance in English Language and Level of Stress

(I) Level of Stress	(J) Level of Stress	Mean Difference (I-J)	Std. Error	Sig.
Low	Moderate	1.090	.580	.062
	High	1.668*	.589	.005
Moderate	Low	-1.090	.580	.062
	High	.578	.588	.327
High	Low	-1.668*	.589	.005
	Moderate	-.578	.588	.327

Evidence from Table 27 shows that significant difference existed between respondents with low level of stress and high level of stress (1.668; $p < 0.00$), but no significant differences were found between low level of stress and moderate level of stress (1.090; $p > 0.062$). Again, no significant difference existed between high level stress and moderate level (0.578; $p > 0.37$). This further shows that participants with lower level of stress did better in English Language than those with moderate stress and high stress, while participants with moderate stress did better than those that had a high level of stress.

4.2 Summary of Findings

Based on the research hypothesis formulated, the study reveals that:

1. There is a significant difference in stress factor between participants exposed to Cognitive Restructuring Therapy and those in the Control Group.
2. Gender does not significantly affect social factor stress among participants. Gender does not significantly affect physical factor stress across the groups.
3. There is significant gender effect on academic factor stress among participants.
4. There is significant interaction effect between experimental conditions and gender in post-test mean scores of stress among participants.
5. There is no significant effect of experimental conditions and stress level on post-test scores of academic performance in Mathematics among the participants.
6. There is significant effect of experimental conditions and stress level on post-test scores of academic performance in English Language among the participants.

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Discussion of Findings

The first hypothesis stated that gender and experimental conditions would not have significant effect on post-test mean scores of social factor stress among participants. The findings indicated that there was no significant gender difference between the Training Group and the Control Group on social factor stress. The social stress between male and female participants was not significant despite the intervention of cognitive restructuring. The reason behind these findings was that some of the participants (male and female) may had interpersonal and emotional problems with their parents and teachers, They might also lack knowledge of how to tackle relationship problems. This relationship problem could be in form of making friends, visiting friends, and avoid shyness. In such case, both sexes were equally exposed to cognitive restructuring which normalizes their emotional feelings after the intervention programmes. The result is in support of the work of Ahmad and Lama (2012), who did a study on assessing stress among university students. Their results showed that gender and social stress were not statistically significant. In line with this study, Akande, Olowonirejuaro and Okwara-Kalu (2014) also did a study on level and sources of stress among secondary school students. Their study also revealed that there was no significant gender difference in inter-personal sources of stress among students. This is also in line with Kai-wen (2010), whose study found no significant gender difference in the relationship factor as a source of stress among college students in Taiwan.

However, the findings were not in agreement with the work of Roslee, Aqeel, and Mohamed (2015) who did a research on Self-Concept and Stress among Junior and Senior School

Counsellors: A Comparison Case Study in Secondary Schools in Malacca. They worked on social self-stress. The mean scores for male counsellors ($M = 41.75$) and female counsellors ($M = 40.50$) show that the mean value for the social self-stress in male counsellors is higher than in female counsellors. The t-test results for social self-stress ($t = 2.05$, $p < .05$) showed significant differences between male and female counsellors. In other words, male and female counsellors show differences in their social life, including their relationship with family members, friends, school administrators, students, and others. The higher mean score for male counsellors show that they perceive themselves as being loved, favoured, and able to easily mix and interact with others more than female counsellors, who tend to focus on emotions or feelings while socializing with others.

The second hypothesis stated that gender and experimental conditions would not have significant effect on post-test mean scores of physical factor stress among participants. The findings of this study indicated that there was no significant gender difference between the Training Group and the Control Group on physical stress despite the intervention of cognitive restructuring. The reason behind this findings was that male and female participants were at one time or the other assaulted physically both at home and in school. This assault could be in form rape, beat with a whip or stick as a punishment, starved for food, dehydration, lack of medical care to mention but a few. The finding of this study is in support of the study of Rajni and Radhakata (2012), who did a study on the relationship between stress and academic achievement. Their results indicated that there was no significant difference between physical stress and academic performance among male and female students. In support of this finding, Roslee, Aqeel and Mohamed (2015) also did a research on Self-Concept and Stress among Junior and Senior School Counsellors in Malacca. Their results on self-concept subscale of physical self-stress showed no significant difference between male and female counsellors.. This means that female counsellors were prepared to conduct outdoor activities such as mountain

climbing with their clients, spending the night in a tent, and taking their sick clients to the hospital, like their male counterparts. Female counsellors work with full dedication and an optimum workload, which is meaningful to their lives.

However, the findings of this study was not in agreement with that of Kelly et al. (2001) who did a study on the relationship between sleep length and grade-point-average among male and female college students. They classified sleepers into three categories among male and female students: 1) Short sleepers, individuals who, when left to set their own schedule, slept six or fewer hours; 2) Average sleepers, individuals who slept seven or eight hours; and 3) long sleepers, individuals who slept nine or more hours out of twenty-four. The study found that students who were considered long sleepers reported higher GPAs than those who were short and average sleepers. This is because people who sleep fewer hours at night may have psychological maladjustment and this increases their anxiety and stress, which has been associated with poorer academic performance. These factors cause problems to students such as shortened attention span and increasing the number of errors students make on tests.

The third hypothesis stated that significant effect of gender and experimental conditions would not have effect on post-test mean scores of academic factor stress among participants. The result of the analysis revealed that there was a significant difference in academic factor stress between participants in the Cognitive Restructuring Group and those in the Control Group. The intervention was suitable because time management technique were used by the researcher to help the students manage their time and to allocate enough time to each subject (Mathematics and English Language). This could be another way to decrease their academic stress, because allocating enough time to subjects based on their priority and importance helped to reduce time pressures and provides opportunities to other social activities, personal hobbies and interests. This trend could be associated with the fact that Cognitive Restructuring helps client to consider any maladaptive patterns in their thinking-feeling-behaviour cycles. The client's goal is to

rethink these patterns and consider more adaptive alternatives that will work better for him or her. The result of the study is corroborated by the findings of the study conducted by Smritikana (2016), who did a study on Academic Stress among government and private high school students. From the findings, female students experienced more academic stress than their male counterparts. This may be due to the fact that females are more sensitive and sincere by nature and take everything very seriously, whereas males are generally more easy-going and happy-go-lucky. In line with this finding, Akande, Olowonirejuaro and Okwara-Kalu (2014) did a study on levels and sources of stress among secondary school students. The results of hypothesis testing indicated a significant gender difference in the levels of stress among secondary school students. The female students tended to experience more stress than the male students. This could be attributed to the nature of females, who are generally more emotional than males.

The fourth hypothesis stated that significant interaction between experimental conditions and gender would not affect post-test mean scores of stress among participants. The findings obtained in this hypothesis showed that there was a significant difference in stress scores between male and female students. The difference could be as a result of the sensitivity of female students to stress due to their fragile nature. More so, working with students to interrupt negative thought processes, replace those thought processes with rational, healthy thoughts while at the same time breathing through the nose and out the mouth while tensing and relaxing various muscles group) to help students prepare for testing or other stressful events. The intervention was effective to help students reduce related stress. The result is not in support of the work of Rajni and Radhakata (2012), who did a study on the relationship between stress and academic achievement of male and female secondary school students. They found out that there was no significant gender difference in stress and academic achievement of Senior Secondary School students.

The fifth hypothesis stated that there was no significant interaction effect of experimental conditions and stress level on post-test scores of academic performance among participants. The finding indicated that there was no significant interaction effect of experimental condition and level of stress on academic performance in Mathematics. . The reason behind this findings was that irrespective of the nature and level of stress (high, middle and low) students find themselves in studying Mathematics, they find it very difficult to comprehend while receiving lecture in the classroom because the physical, financial and emotional stress melted on them affect them negatively. In support of this study, Kamarudin, Aris, Mohd, Siong, Mohamed and Ibrahim (2009) did a research on the impact of perceived stress and stress factors on academic performance of pre-diploma science students. Their findings showed that there was no significant difference in perceived stress level between performance of student at the beginning and middle of the semester. However, this finding was not in agreement with the findings of Rafidah, et al., (2009) where they found out that students of moderate degree stress had satisfactory GPAs. They reported that the moderate stress experienced by the students is desirable for attaining good academic performance.

The sixth hypothesis stated that there was no significant effect of experimental conditions and stress level on post-test scores of academic performance in English Language among participants. The finding indicated that there was significant effect of experimental condition and level of stress on academic performance in English language. The reason could be attributed to the use of meditation and breathing strategy of Cognitive Restructuring introduced to the training group. In support of this study, Keun and Myeong (2015) did a study on the relationship between the stress from learning English and defence mechanism of elementary school in Daejeon, South Korea. The results showed that comparison of the academic achievements of the two groups revealed a significant difference based on level of stress. In particular, the students in the low-stress group gained higher scores in English achievement than those in the high-stress

group. Therefore, academic stress can be considered to be an important learning condition in English Language classrooms.

5.2 Conclusion

This research work has been able to provide meaningful insight to the use of cognitive-restructuring training as a strategy for reducing stress in Mathematics and English Language among secondary school students. It has also been able to determine its effectiveness in the treatment of students (male and female) with different levels of stress (low, medium and high). It was also discovered that students with lower stress perform better in English Language while those that had higher stress perform better in Mathematics.

5.3 Implications for Counselling

The implication of this study is that counsellors can use cognitive restructuring techniques to reduce stress of low-achieving students, which may assist in enhancing their performance in Mathematics and English language. Another implication is that both male and female low-achieving students can equally benefit from cognitive restructuring intervention programme.

5.4 Recommendations

The following recommendations were made for this study:

1. Counsellors should use this study to get a theoretical and empirical basis for adopting cognitive restructuring in reducing stress in Mathematics and English language.
2. Parents need to be counselled so as to enable them understand the stress challenges faced by their students in schools. This will equip them with appropriate and realistic solutions in giving attention to affected students.
3. Parents should motivate their children/wards to have a positive attitude towards

Mathematics and English language by buying textbooks for them and if possible get a lesson teacher for them so that they will not be afraid of the subject but rather develop interest in it.

4. Teachers should cooperate with the school counsellors by referring the Mathematics anxious students to the counsellors as quickly as possible instead of using cane or force to make them perform better in Mathematics.
5. Government should sponsor seminars/workshops for counsellors on how cognitive-restructuring and problem solving would be used more effectively to help identify students that have stress in Mathematics and English Language..
6. Government should ensure that schools organize workshops for students regularly on the importance of Mathematics and English Language to their career development and progress
7. The Nigerian government should encourage counselling by employing more counsellors in all educational institutions. This is to effectively serve the community.

5.5 Contributions to Knowledge

The study contributed to knowledge in the following ways:

1. The study has produced a training package on Cognitive Restructuring which has been used to reduce stress levels because students were able to change their negative thoughts about solving problems related with stress.
2. The study established that Cognitive Restructuring is an effective counselling therapy that could be used to enhance academic performance in Mathematics and English Language.

5.6 Suggestions for Further Studies

This study has enhanced expertise and more experience was acquired. To this effect, the followings are suggested for further studies:

1. Variables such as peer pressure, marital status of parents, nature of parents' job (self-employed, private or public employed), among others could be considered as intervening variables to stress and academic performance.
2. Moreover, studies should be done on the relative effectiveness of cognitive-restructuring and study skills training on the adjustment to academic failure among a group of Nigerian students.
3. In replicating this study other psychological issues such as personality problems could be studied using Cognitive Restructuring.

5.7 Limitation of the Study

There were a lot of constraints encountered by the researcher during the study. The study witnessed some slight limitation in the course of carrying out the research. The distance between the researcher's home and the location of the schools proved to be a major limiting factor to the study. This was because the researcher had to travel from Lagos to Ogun State and live there for the period of the research. The study also witnessed some slight limitation in the course of carrying out the research. Few of the students were not so consistent in attending the training, but were later persuaded. Some of the students who started the treatment did not complete it. The researcher also encountered a lot of shortcomings such as transportation and finance.

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APPENDIX A

Scale for Assessing Academic Stress (SAAS) by Sinhaet al., (2001)

Dear student,

This questionnaire is designed to find out your background and feelings towards the stress experienced in school. This is not a test. Your response will help a lot in improving learning in schools and it will be treated in strict confidentiality. So feel free and respond to the following items.

SECTION A: Personal Background Information

Please respond to the items as considered appropriate.

School: -----

Gender: Male () Female ()

Level of Stress: High () Moderate () Low ()

Age: 13-15 years () 16 years and above ()

Parents Marital Status: Living together () living with one parents () Living with relatives ()

The options include Never: 0, Rarely: 1, Sometimes: 2, Often: 3 and Very Often: 4

S/N	PHYSICAL STRESS	0	1	2	3	4
1	I get daily headache when reading.					
2	I hardly sleep because of worry of meeting the goal I set for myself.					
3	I don't feel like eating.					
4	I feel tired doing my work.					
5	My heart beats fast.					
6	I get nervous when am asked to answer any questions.					
7	I suffer from neck pains when reading.					
8	I suffer from back pains when reading too long.					
9	I feel sometimes high temperature.					
10	I feel sometimes low temperature.					
11	I can't stretch my hands.					
	SOCIAL AND INTERPERSONAL STRESS					
1	I get irritated with everyone.					
2	I always feel that nobody is willing to help me.					
3	I like staying alone.					
4	I felt nobody understood me.					

5	I don't feel like talking to anybody.					
6	I have relationship with my friends.					
7	I enjoy meeting people.					
8	I always had verbal abuse from my family.					
9	I deal with others nervously when they try to provoke me.					
	ACADEMIC/COGNITIVE STRESS					
1	I find it difficult to concentrate during study hours.					
2	I forget easily what I read.					
3	I always had day dreaming.					
4	I find it difficult to solve problem giving to me.					
5	I feel there is too much home work.					
6	I doubt my abilities.					
7	Am unable to answer questions from teachers					
8	I feel that my teacher gave out test frequently.					
9	I worry about results after examination.					
10	I don't know how to prepare for the examination					
11	I have conducive space for my study.					
12	I am very dissatisfied with my low academic grades.					
13	I feel that I have disappointed my parents when my exam results are poor.					
14	I had pressure as result of too much competition among class mate.					
15	I hardly understood teachers explanation because of overcrowded class.					

APPENDIX B

ACADEMIC STRESS SCALE

This scale consists of 40 items describing the stress in your institution/ college life from the various sources. The level of stress you feel for each item ☐ can mark be in the bracket given against each statement.

If you feel 'No' mark Stress in bracket put the (NS),

Slight Stress in the 2nd (SS), Moderate Stress in the 3rd (MS), High Stress in the 4th (HS) and you feel 'ExtrememekinSt 5th bracket (ES).

S/No	Statement	NS	SS	MS	HS	ES
1.	Teachers make too many extra demands on students	()	()	()	()	()
2.	Poor interest in some subjects.	()	()	()	()	()
3.	Progress reports to parents	()	()	()	()	()
4.	The teacher is not humours towards us.	()	()	()	()	()
5.	Lack of concentration during study hours.	()	()	()	()	()
6.	Difficulty in remembering all that is studied.	()	()	()	()	()
7.	Worrying about the examinations.	()	()	()	()	()
8.	Lack of self-confidence.	()	()	()	()	()
9.	The teachers do not listen to our ideas.	()	()	()	()	()
10.	Conflict with friends/college authorities.	()	()	()	()	()
11.	Teachers give more punishment in the class.	()	()	()	()	()
12.	Worry about results after examinations.	()	()	()	()	()
13.	Hesitate to ask the teacher for detailed explanation.	()	()	()	()	()
14.	Biased attitude of the teacher.	()	()	()	()	()
15.	Inadequate space or room for study at home.	()	()	()	()	()
16.	Not knowing how to prepare for the examinations.	()	()	()	()	()
17.	Lack of assertiveness (confidence) in the class.	()	()	()	()	()
18.	Lack of opportunity to meet teachers.	()	()	()	()	()

19.	Teacher shows socio-economic status on students.	()	()	()	()	()
20.	Slow in getting along with the curriculum.	()	()	()	()	()
21.	Exam papers are tough and not valued well.	()	()	()	()	()
22.	Unable to complete the assignment in time.	()	()	()	()	()
23.	Lack of communication between teachers and students	()	()	()	()	()
24.	Monotonous (boring or tedious) teaching style by the teacher	()	()	()	()	()
25.	Not enough discussion in the class.	()	()	()	()	()
26.	Lack of mutual help among classmates.	()	()	()	()	()
27.	Lack of fluency while speaking the language other than the mother tongue.	()	()	()	()	()
28.	Difficulty in public speaking.	()	()	()	()	()
29.	The teacher is fast and does not use blackboard legibly.	()	()	()	()	()
30.	Teachers lacking interest in students.	()	()	()	()	()
31.	Examination syllabus is too heavy in some subjects.	()	()	()	()	()
32.	Feeling of inferiority.	()	()	()	()	()
33.	Unable to discuss Academic failures with parents.	()	()	()	()	()
34.	Not able to grasp the subject matter.	()	()	()	()	()
35.	Incomplete and confusing study material.	()	()	()	()	()
36.	Eleventh hour preparation for the examinations.	()	()	()	()	()
37.	Importance of the subject matter.	()	()	()	()	()
38.	Difficulty in adjusting with opposite gender.	()	()	()	()	()
39.	Inadequate subject knowledge of the teacher.	()	()	()	()	()
40.	Inadequate lab and library facilities.	()	()	()	()	()

APPENDIX C

Mathematics Performance Test

Section A (Objective Test)

1. Which of the following is an Arithmetic progression?
 - (a) 11, 9, 5, 2.....
 - (b) 2, 4, 8, 16.....
 - (c) 11, 12, 13, 14.....
 - (d) 1, 6, 36, 72.....
2. The n th term of Arithmetic progression is?
 - (a) $a + (n - 1)d$
 - (b) $a + (1 - n)d$
 - (c) $a - (n - 1)d$
 - (d) $a + d(n + 1)$
3. Find the 20th term of an A.P 3, 0, -3, -6.....
 - (a) 54
 - (b) -54
 - (c) 45
 - (d) -45
4. If the 5th term of an A.P. is 17 and the 12th term is 31. What is the first term?
 - (a) 6
 - (b) 7
 - (c) 8
 - (d) 9
5. Calculate the sum of the first ten term of the Arithmetic progression 3 + 5+7+9+....
 - (a) 120
 - (b) 122
 - (c) 124
 - (d) 126
6. Which of these is an example of Geometric progression?
 - (a) -1, 2, -4, 8, -14.....

- (b) 1, 2, 4, 16.....
- (c) -1, -2, -4, -8, -16.....
- (d) 1, 2, 4, 6, 8.....
7. The n th term of a Geometric progression is?
- (a) ar^{n-1}
- (b) ar^n
- (c) arn^{-1}
- (d) ar^{1-n}
8. The second term of Geometric is 18 and the fourth is 162. Find the common ratio.
- (a) 3
- (b) 4
- (c) 5
- (d) 6
9. Calculate the sixth term of the Arithmetic progression 6, 9, 12, 15.....
- (a) 20
- (b) 21
- (c) 22
- (d) 23
10. The 6th term of a G.P is 2000. Find its first term if its common ratio is 10.
- (a) 0.01
- (b) 0.04
- (c) 0.03
- (d) 0.02
11. The 6th term of a G.P is 2000. Find its 10th term if its common ratio is 10.
- (a) 10×10^6
- (b) 40×10^6
- (c) 20×10^6
- (d) 30×10^6
12. The 6th term of a G.P is 2000. Find its 20th term if its common ratio is 10.
- (a) 10×10^{16}

(b) 40×10^{16}

(c) 30×10^{16}

(d) 20×10^{16}

13. A coin is tossed and a die is thrown. What is the probability of getting a head and a perfect square?

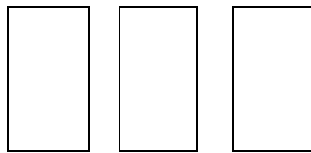
(a) $1/3$

(b) $5/12$

(c) $1/6$

(d) $5/6$

14. Five cards are lettered A, B, C, D, E. Three cards are chosen at random, one after the other, without replacement and are placed in the order shown below: 1st 2nd 3rd



What is the probability that the cards spell the word BED?

(a) $1/125$

(b) $1/5$

(c) $1/20$

(d) $1/60$

15. When two dice are thrown, what is the probability of the total score being a prime number?

(a) $11/12$

(b) $5/12$

(c) $7/12$

(d) $\frac{1}{2}$

16. When three dice are thrown together what is the probability of getting a total score of 10?

(a) $1/3$

(b) $1/6$

(c) $1/8$

- (d) none of the above
17. A statistical survey shows that 28% of all men take size 9 shoes. What is the probability that your friends father takes size 9 shoes?
- (a) $18/25$
(b) $9/28$
(c) none of the above
(d) $7/25$
18. A school contains 357 boys and 323 girls. If a student is chosen at random, what is the probability that a girl is chosen?
- (a) $19/40$
(b) $21/40$
(c) $29/40$
(d) none of the above
19. A State Lottery sells $1^{1/2}$ million tickets of which 300 are prize winners. What is the probability of getting a prize by buying just one ticket?
- (a) $1/500$
(b) $1/5000$
(c) $1/50$
(d) $1/5$
20. Statistics show that 92 out of every 100 adults are at least 150cm tall. What is the probability that a person chosen at random from a large crowd is less than 150cm tall?
- (a) $23/25$
(b) $21/25$
(c) $2/25$
(d) none of the above

Give all distances correct to 3 significant figure and all angles and bearings correct to 0.1° in question 21- 34.

21. From a point on the edge of the sea, one ship is 5km away on a bearing $S 50^\circ E$ and another is 2km away on a bearing $S 60^\circ W$. How far apart are the ships?
- (a) 5.99km
(b) 6.99km
(c) 7.99km

(d) 8.99km

22. A student walks 50m on a bearing 025° and then 200m due east. How far is she from her starting point?

- (a) 326m
- (b) 226m
- (c) 526m
- (d) 426m

23. Two goal posts are 8m apart. A footballer is 34m from one post and 38m from the other. Within what angle must he kick the ball if he is to score a goal?

- (a) 41°
- (b) 31°
- (c) 21°
- (d) 11°

24. City A is 300km due east of city B. City C is 200km on a bearing of 123° from city B. How far is it from C to A?

- (a) 161km
- (b) 171km
- (c) 151km
- (d) 141km

25. A triangular field has two sides 50m and 60m long, and the angle between these sides is 96° . How long is the third side?

- (a) 92.0m
- (b) 62.0m
- (c) 82.0m
- (d) 72.0m

26. Two boats A and B left a port C at the same time on different routes. B travelled on a bearing of 150° and A travelled on the north side of B. When A had travelled 8km and B had travelled 10km, the distance between the two boats was found to be 12km. Calculate the bearing of A's route from C.

- (a) 157.2°
- (b) 57.2°
- (c) 22.8°
- (d) 67.2°

27. A surveyor leaves her base camp and drives 42km on a bearing of 032° . She then drives 28km on a bearing of 154° . How far is she then from her base camp and what is her bearing from it?

- (a) 36.1km, 73.2°
- (b) 46.1km, 73.2°
- (c) 36.1km, 83.2°
- (d) 46.1km, 83.2°

28. Two ships leave port at the same time. One travels at 5km/h on a bearing of 046° . The other travel at 5km/h on a bearing of 127° . How far apart are the ships after 2 hours?

- (a) 19.2m
- (b) 13m
- (c) 20m
- (d) 6.5m

29. A boat sails 4km on a bearing of 038° and then 5km on a bearing of 067° .

- a) How far is the boat from its starting point?
- b) Calculate the bearing of the boat from its starting point.

- (a) 9.72km, 54.1°
- (b) 8.72km, 64.1°
- (c) 8.72km, 054.1°
- (d) 9.72km, 64.1°

30. A photographer is 350m away from a lion and wants to get closer before he takes a photograph. There is a water-hole in the direct line between the lion and himself, so he moves at an angle of 8° to this line to a better position 200m further on. Calculate his distance from the lion.

- (a) 154m
- (b) 164m
- (c) 174m
- (d) 184m

31. Three towns, A, B and C are situated so that so that $|AB| = 60\text{km}$ and $|AC| = 100\text{km}$. The bearing of B from A is 060° and the bearing of C from A is 290° . Calculate the distance $|BC|$, the bearing of B from C

- (a) 156km, 91°
- (b) 146km, 81.7°
- (c) 146km, 91.7°

(d) 156km, 81.7

32. A ship leaves port and travels 21km on a bearing of 032° and then 45km on a bearing of 287° . (a) Calculate its distance from the port.

(b) Calculate the bearing of the port from the ship.

(a) 44.5km, 144.1°

(b) 44.5km, 134.1°

(c) 55.5km, 144.1°

(d) 55.5km, 134.1°

33. An aircraft flies round a triangular course. The first leg is 200km on a bearing of 115° and the second leg is 150km on a bearing of 230° . How long is the third leg course and what bearing must the aircraft fly?

(a) 196km, 329.9°

(b) 196km, 339.9°

(c) 193km, 329.9°

(d) 193km, 339.9°

34. Villages A, B, C, D, are such that B is 4km due east of A, C is 3km due south of B and D is 4km $S 50^{\circ} W$ from C. Calculate the distance and bearing of A from D.

(a) 5.65km, $N 9.5^{\circ} W$ (or 350.5°)

(b) 6.65km, $N 9.5^{\circ} W$ (or 350.5°)

(c) 5.65km, $N 10.5^{\circ} W$ (or 349.5°)

(d) 6.65km, $N 10.5^{\circ} W$ (or 349.5°)

35. A girl moves from a point P on a bearing of 60° to a point Q, 40m away. She then moves from the point Q on a bearing of 120° to a point R. The bearing of P from R is 255° . Calculate correct to three significant figures, the distance between P and R.

(a) 29.9km

(b) 39.9km

(c) 49.0km

(d) 47.9km

36. Which of the following is a quadratic expression?

(a) $ax^2 + bx + c = 0$

(b) $ax + c$

(c) $ax^2 + bx + c$

(d) $9x + y = z$

Use quadratic formula to solve question 37-40. Give the roots correct to 2 decimal places when necessary.

37. $x^2 + 5x + 6 = 0$

(a) 2, 3

(b) -2, -3

(c) -2, 3

(d) 2, -3

38. $x^2 - 5x + 4 = 0$

(a) -1, -4

(b) -1, 4

(c) 1, 4

(d) 1, -4

39. $2x^2 + 5x + 3 = 0$

(a) -1, $1^{1/2}$

(b) -1, $-1^{1/2}$

(c) 1, $-1^{1/2}$

(d) 1, $1^{1/2}$

40. $3x^2 - 4x + 1 = 0$

(a) -1, $-\frac{1}{3}$

(b) -1, $\frac{1}{3}$

(c) 1, $-\frac{1}{3}$

(d) 1, $\frac{1}{3}$

41. Find two numbers which differ by 4 and whose product is 45.

(a) 9, 5 or -5, -9

(b) 9, -5 or -5, -9

(c) -9, 5 or 5, 9

(d) none of the above

42. Find the number which, when added to its square, mark 90.

(a) -10 or 90

(b) 10 or 29

(c) -9 or 19

(d) 9 or -10

43. Twice the square of a certain whole number added to 3 times the number makes 90. Find the number.

(a) 8

(b) 7

(c) 6

(d) 9

44. A man is 37 years old and his child's age is 8. How many years ago was the product of their ages 96?

(a) 8years

(b) 7years

(c) 6years

(d) 5 years

45. A certain number is subtracted from 18 and from 13. The product of the two numbers obtained is 66 Find the first number.

(a) 7 or 24

(b) 7 or 21

(c) 8 or 24

(d) 8 or 21

46. Find two consecutive even numbers whose product is 224.

(a) 12, 13 or -13, -12

(b) 14, 16 or -16, -14

(c) 12, 14 or -12, -14

(d) 16, 18 or -16, -18

47. The base of a triangle is 3cm longer than its corresponding height. If the area is 44cm^2 , find the length of its base.

(a) 5cm

(b) 3cm

(c) 8cm

(d) 11cm

Using irrational root method solve the equation in question 48-50

48. $(x-2)^2 = 9$

- (a) 5, -1
 - (b) -5, -1
 - (c) 5, 1
 - (d) -5, 1
49. $(x - 7)^2 = 4$
- (a) -9, -5
 - (b) -9, 5
 - (c) 9, 5
 - (d) 9, -5
50. $(x + 3)^2 = 4$
- (a) 1, 5
 - (b) -1, -5
 - (c) -1, 5
 - (d) 1, -5

APPENDIX D

KEYS

1	C
2	A
3	B
4	D
5	A
6	C
7	A
8	A
9	B
10	D
11	C
12	D
13	C
14	D
15	B
16	C
17	D
18	A
19	B
20	C
21	A
22	B
23	D
24	B
25	C
26	D
27	A
28	B

29	C
30	A
31	C
32	B
33	D
34	A
35	C
36	A
37	B
38	C
39	B
40	D
41	A
42	D
43	C
44	D
45	A
46	B
47	D
48	A
49	C
50	B

APPENDIX E
ENGLISH LANGUAGE PERFORMANCE TEST
SECTION A (Objective Test)

Passage

Read the passage carefully and answer the questions below:

Africa has the highest incidence of child labour in the world. According to the International Labour Organisation, forty – one percent of all African children between the ages of five and fourteen are involved in some form of economic activity, compared with twenty – one percent in Asia and seventeen in Latin America.

It is no coincidence that Africa also is the poorest region with the weakest school systems. Among African children those from poorer families are far more likely to seek work.

Parents and guardians of working children, when asked why they let their children work most often responded. “to supplement household income”. According to an ILO study on Tanzania, the incidence of child labour has risen partly because of the deterioration of the school system, itself a result of economic decline. Poor infrastructure, low teacher morale and the introduction of school fees under the country’s structural adjustment programme have contributed to higher drop – out and truancy rates. Thirty percent of all children between ten and fourteen are not attending school and many end up working.

AIDS, a frightful monster is another contributory factor in many African countries. By killing so many breadwinners, it has driven more families deeper on the poverty, placing an even greater burden on the survivor including children.

A UNICEF study of six countries in Eastern and Southern Africa found that the dissolution of families from HIV/AIDS increases the likelihood of children being forced into exploitative labour..... just

when children should be in school, their burdensome new role as family breadwinner forces them to drop out.

(The Punch, Nov. 11, 2004).

- (1) What is the figure of speech of the above expression
 - A. Simile
 - B. Personification
 - C. Hyperbole
 - D. Metaphor
- (2) Why are about thirty percent of children between ages ten and fourteen in Tanzania not attending school?
 - A. Poor infrastructure, HIV/AIDS and exploitative labour
 - B. Low teacher morale, school fees and poor infrastructure
 - C. To supplement household income and be a better breadwinner
 - D. Increase in livelihood of children and poor family
- (3) What is the grammatical function of the above expression? It is the subject of the verb “.....”
 - A. work
 - B. working
 - C. responded
 - D. asked
- (4) “Parents and guardians of working children”

What is the grammatical name of the above expression as used in the passage?

- A. Noun phrase
 - B. Noun clause
 - C. Adjectival clause
 - D. Adjectival phrase
- (5) The topic “Girls are more useful at home than boys” is an example of essay.
- A. Descriptive
 - B. Argumentative
 - C. Narrative
 - D. Technical
- (6) HIV/AIDS contribute to child labour because
- A. parents and guardians of working children want them to supplement income
 - B. it affects many school children and have to go to the hospital for treatment
 - C. The decrease has killed many breadwinners, hence children take the burden
 - D. HIV/AIDS and child labour cause a lot of families to be poor
- (7) Another word or phrase in the passage that can replace “deterioration” as used in the passage is
- A. diminish situation
 - B. decadence
 - C. worsening situation
 - D. burden

From the options lettered A – D, choose the one that can best fill the gap in each sentence.

- (8) He brought us good news

- A. many
- B. some
- C. a
- D. several

(9) Although Bola has taken a bottle of water, yet she feeling thirsty

- A. was
- B. has
- C. were
- D. is

(10) We have your report and found it impressive

- A. gone through
- B. gone into
- C. gone off
- D. gone across

(11) Moji is very kind. Her is known by everybody

- A. kind
- B. kindly
- C. kindness
- D. candid

(12) is in the eye of the beholder

- A. The beauty

- B. Beautiful
- C. Beauty
- D. The most beautiful

(13) As it continued to rain and there was no shelter in sight, we had to walk to the next village in the rain.

The above is an example of a sentence

- A. complex
- B. simple sentence
- C. compound – complex
- D. compound

(14) We learnt at school that the earth round the sun

- A. moves
- B. go
- C. gone
- D. moved

From the options lettered A – D, choose the best option to fill each gap.

(15) Argumentative essay requires the writer to

- A. present a view point
- B. conclude his presentation
- C. start a view point
- D. prove his point

Fill in the gap with the appropriate option listed below

(16) The election into the House of Assembly has been

- A. called off
- B. called up
- C. called for
- D. called on

(17) May I see your passport please? What tone is used in this statement?

- A. falling intonation
- B. rising and falling intonation
- C. falling and rising intonation
- D. rising intonation

(18) The (big) of the three apples belongs to my baby

- A. big
- B. bigger
- C. biggest
- D. most big

(19) The woman was upset

- A. their self
- B. himself
- C. she
- D. Herself

(20) She performed as the red house princess in the last inter – house sport competition

- A. beautifully
- B. beauty
- C. beautiful
- D. beautify

(21) placed the book on the shelf

- A. Who
- B. whom
- C. Whose
- D. Who's

(22) While waiting at the train station, I came an old school mate

- A. across
- B. by
- C. over
- D. into

(23) Never the beggars

- A. look down for
- B. look down into
- C. look down with
- D. look down on

From options A – D, choose the correct one that answers the following questions

(24) Mrs. Adetola ordered for some goods from Ghana, while they were being transported by sea, some of them got damaged and Mrs. Adetola decided to write a letter of complaint to the company in Ghana

Mrs. Adetola will write type of letter

- A. informal
- B. Semi-formal
- C. formal
- D. personal

(25) A write – up ‘How to repair a computer’ is an example of a/an

- A. story
- B. argumentative
- C. technical
- D. letter

(26) The two boys were..... over a plate of rice when their mother came in

- A. quarelling
- B. quarrelling
- C. quareling
- D. quarealing

(27) A/an essay informs

- A. expository
- B. descriptive
- C. narrative
- D. argumentative

From the options lettered A – D, choose the one with the correct answer.

(28) The tall boy who ran the race has been promoted

The grammatical name of the underlined is

- A. adjectival phrase
- B. verb phrase
- C. noun phrase
- D. adverbial phrase

(29) He is the runner in our school

- A. faster
- B. more faster
- C. fastest
- D. more fastest

(30) President Goodluck Jonathan with his entourage is visiting Lagos State tomorrow

The underlined tense is

- A. present perfect tense
- B. perfect tense
- C. present future
- D. present continuous tense

(31) I know that this house belongs to Mr.Tade, butis that one over there?

- A. who's
- B. whose
- C. whom
- D. of whom

Read each sentence carefully and choose from the options lettered A – D the word that is correctly spelt, to fill the gap.

(32) Lagos is an area with a lot of job

- A. opportunities
- B. opportunities
- C. opportunitys
- D. opportunities

Choose the option that is correct to identify the syllable that has the primary stress.

(33) Humiliate

- A. HU-mi-li – ate
- B. hu-mi-li-ATE
- C. hu-MI-li-ate
- D. hu-mi-LI-ate

From the words lettered A – D, choose the word that rhymes with the given word.

(34) allow

- A. below
- B. holy
- C. abound
- D. hollow

Choose the one that has the correct stress

(35) comfortable

- A. com-FOR-ta-ble
- B. com-for-ta-BLE
- C. com-for-TA-ble
- D. COM-for-ta-ble

From options A – D, choose the one that best complete the following sentences

(36) Accident victims are treated at the department of a hospital

- A. pharmacy
- B. casualty
- C. mortuary
- D. anatomy

(37) My grandfather has the albino

- A. skin
- B. eye
- C. gene
- D. colour

(38) The nurse the student's wound

- A. bathed
- B. decorated
- C. plastered
- D. dressed

(39) The doctor the injured man thoroughly

- A. consulted
- B. examined
- C. inspected
- D. tested

Read each sentence carefully and choose from the options lettered A – D the one that best fills each gap.

(40) Demola is looking forward to back to school

- A. going
- B. go
- C. goes
- D. gone

(41) A talk or an address that is delivered orally to an audience is called

- A. speech presentation
- B. audience presentation
- C. oral presentation
- D. personal introduction

From the options A – D, choose the one that will answer the following questions correctly.

(42) In the word ‘scrawl’, the consonants cluster occur as the position

- A. medium
- B. middle
- C. initial
- D. final

(43) We bought the drug which the doctor prescribed

The underlined is a clause

- A. subordinate
- B. main

C. independent

D. coordinating

(44) My sister visited the office of the Planned Parent Federation for an advice on family planning.

A. -ship

B. -hood

C. -ant

D. -ment

(45) The students are working hard

The above is an example of tune

A. falling tune

B. fall – rise

C. rise-fall

D. rising tune

From options A – D, choose the correct word that has the same consonant sound with the one underlined

(46) Flame

A. very

B. plate

C. of

D. trophy

(47) Sing

A. lung

B. seen

C. lounge

D. sin

Choose the word that has the same vowel sound with the one underlined in the given word.

(48) away

- A. dark
- B. doctor
- C. bank
- D. addict

(49) love

- A. sum
- B. court
- C. rode
- D. rod

(50) glide

- A. glad
- B. lid
- C. hike
- D. glee

APPENDIX F

ENGLISH LANGUAGE MARKING GUIDE

1. D
2. B
3. C
4. A
5. B
6. C
7. A
8. B
9. D
10. A
11. C
12. C
13. C
14. A
15. D
16. A
17. D
18. C
19. D
20. A
21. A
22. A
23. D
24. C
25. C
26. A
27. A

- 28. C
- 29. C
- 30. D
- 31. B
- 32. A
- 33. C
- 34. C
- 35. D
- 36. B
- 37. C
- 38. D
- 39. B
- 40. A
- 41. A
- 42. C
- 43. A
- 44. B
- 45. A
- 46. D
- 47. A
- 48. B
- 49. A
- 50. C

APPENDIX G

LETTER OF INTRODUCTION

